AEROMAT/ITSC/IMS
CO-LOCATED FOR THE FIRST TIME

MAY 11–14, 2015
LONG BEACH CONVENTION CENTER
LONG BEACH, CALIFORNIA, USA

AEROMAT 2015
CONFERENCE & EXPOSITION

International Thermal Spray
Conference and Exposition

Microstructural Characterization of
Aerospace Materials and Coatings

Shape the Future of Your Industry

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LONG BEACH CONVENTION CENTER

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The pioneers of aviation taught us that whatever the endeavor, passion and vision are the true drivers of innovation and success. Boeing is proud to salute those with the passion and vision to turn dreams into reality.
REGISTRATION
Conference Registration Hours:
Sunday, May 10 ................................. 4:00 p.m.–8:00 p.m.
Monday, May 11 ................................. 7:00 a.m.–7:00 p.m.
Tuesday, May 12 ................................. 7:00 a.m.–5:00 p.m.
Wednesday, May 13 ............................ 7:30 a.m.–5:00 p.m.
Thursday, May 14 .............................. 7:30 a.m.–12:00 p.m.

CO-LOCATION BENEFITS
As an added benefit of registering as an AeroMat 2015 or ITSC 2015 attendee, you receive access to all three co-located events (Aeromat 2015, ITSC 2015 and Microstructural Characterization of Aerospace Materials and Coatings (IMS) technical programs) at no additional charge. Additionally, AeroMat 2015 and ITSC 2015 conference attendees receive access to the Extended Abstracts for AeroMat, Proceedings for ITSC and Extended Abstracts for IMS online. See page 3 for download instructions.

SESSION CHAIRS
Session Chair Packets will be available daily starting at 7:15 a.m. each morning of the conference (ITSC Session Chairs pick up packet in Room 103A and AeroMat Session Chairs pick up packets in Room 203B). Session Chairs are to pick up their session packet, which includes the session details, author biographies and pertinent session details and meet your presenting authors in the session room thirty minutes prior to the start of the session to upload presentations.

SPEAKERS
All speakers should plan to meet in the meeting room of their presentation thirty minutes prior to the start of the session. This will allow all speakers the opportunity to meet their session chair, upload their presentation and go over any final conference details and audio visual concerns.

EXPOSITION
The Show Directory can be found on pages 95
Exposition Hours • Long Beach Convention and Entertainment Center • Exhibit Halls A&B

Monday, May 11
12:00 p.m.–7:00 p.m.
Lunch ............................................... 12:00 p.m.–1:15 p.m.
Opening Plenary Session on the Exhibit Floor ...... 1:30 p.m.–3:00 p.m.
Refreshment Break .................................. 3:00 p.m.–3:30 p.m.
Expo Welcome Reception ............................ 5:30 p.m.–7:00 p.m.

Tuesday, May 12
9:00 a.m.–4:00 p.m.
Refreshment Break .................................. 10:00 a.m.–10:30 a.m.
Lunch ............................................... 12:00 p.m.–1:00 p.m.
Combined Plenary Session on the Exhibit Floor ...... 1:00 p.m.–3:30 p.m.
Refreshment Break .................................. 3:30 p.m.–4:00 p.m.

Wednesday, May 13
9:00 a.m.–4:00 p.m.
Refreshment Break .................................. 10:00 a.m.–10:30 a.m.
Refreshment Break .................................. 3:00 p.m.–3:30 p.m.
REFRESHMENT BREAKS AND LUNCHES
Morning and afternoon refreshment breaks will be provided. Lunch is included with full conference registrations and will be in Exhibit Halls A&B on Monday and Tuesday. Attendees are on their own for lunch Wednesday, May 13th—there will be concessions available throughout the hall as well as restaurants within walking distance.

MOBILE APP
This year’s conference mobile app (MegaShow 2015) will provide key information regarding the AeroMat, ITSC and IMS technical programs, exposition and social events. Available for Apple and Android devices. Please see page 5 or visit the Registration Desk to learn more about the app.

PROCEEDINGS
Each full conference registrant will receive online access to the AeroMat Abstracts, the ITSC Proceedings and IMS Extended Abstracts. Please see page 3 for specific instructions on how to download this content.

CAREER/RESUME BOARD
Post your resume or company’s current job openings on the Career/Resume Board near Registration.

AMERICANS WITH DISABILITIES
In accordance with the Americans with Disabilities Act (ADA) of 1990, ASM International is striving to accommodate all of our guests with special needs. If a disability requires that you have access to modified housing, transportation or other assistance, please inform conference staff.

POLICY ON AUDIO AND VIDEO RECORDING OF TECHNICAL PAPER PRESENTATIONS/SESSIONS
ASM International® reserves the right to any audio and video reproduction of presentations at every technical session. Recording of sessions (audio, video, still photography, etc.) intended for personal use, distribution, publication or copyright without the express written consent of ASM and the individual is strictly prohibited.

POLICY ON CELLULAR PHONE USAGE
In consideration of fellow event attendees and presenters, show management kindly requests your cooperation in minimizing disturbances which may occur during technical sessions. We ask that cellular phones or other electronic devices be placed in “silent mode” while you are in the meeting rooms. Please step outside the meeting room if you need to have a conversation.
CONFERENCE PROCEEDINGS
Conference Proceedings are available to all registered attendees. To access and download the proceedings, log into ASM International's website and look up AeroMat 2015, ITSC 2015, or IMS 2015 within the Conference Proceedings webpage.

Download Instructions: Conference Proceedings or Extended Abstracts
We are honored to offer the extended abstracts to all attendees who receive the proceedings with their conference registration. The conference proceeding is made possible through the diligent work of all the individuals who created the extended abstracts, the technical chairs, and the proceeding editor. Below are the step-by-step instructions on how to access the proceedings for AeroMat 2015, ITSC 2015, or IMS 2015.

1. Go to [www.asminternational.org](http://www.asminternational.org) AND log-in the site using your ASM ID and Password. You will receive this information through email. See registration if you need your ASM ID to login. Please note if you register within two weeks of the conference or on-site, access to the proceedings will be available 24–48 hours after the start of the conference.
2. Click on the EVENTS tab at the top of the page

3. Click on CONFERENCE PROCEEDINGS on the left side navigation bar.

4. Enter AeroMat 2015, ITSC 2015, or IMS 2015 in CONFERENCE PROCEEDINGS SEARCH field and click on SEARCH.

5. Click on the search results to access the complete proceedings or extended abstracts.

All Proceedings files are in Adobe PDF format. To view/print these files you will need to have a PDF reader installed, which comes standard with most personal computers. If you need to obtain a PDF reader, see the Adobe website at http://get.adobe.com/reader/, for information about downloading a free PDF reader.
ATTENDEE LUNCHEONS

Monday, May 11 from 12:00 p.m.–1:15 p.m. and Tuesday, May 12 from 12:00 p.m.–1:00 p.m., Inside Exhibit Halls A&B

Join us for lunch on the Exhibit Floor Monday and Tuesday. One ticket for each lunch is provided with full conference registration. Additional tickets are available for purchase on-site.

- Monday Lunch—Enjoy a tasting of International cuisine
- Tuesday Lunch—A Taste of California
- Concessions also available for purchase

Refreshment Breaks

Morning and afternoon refreshment breaks are offered throughout the conference.

- **Monday, May 11:** Morning Refreshment Break—Meeting Space Foyer
  Afternoon Refreshment Break—Exhibit Halls A&B
- **Tuesday, May 12:** Morning and Afternoon Refreshment Break—Exhibit Halls A&B
- **Wednesday, May 13:** Morning Refreshment Break—Exhibit Halls A&B
  Afternoon Refreshment Break—Exhibit Halls A&B
- **Thursday, May 14:** Morning Refreshment Break—Meeting Space Foyer

Expo Welcome Reception

Monday, May 11, 2015 from 5:30 p.m.–7:00 p.m.—Inside Exhibit Halls A&B

All are welcome! Connect with exhibitors in a relaxed environment as we celebrate the opening of our co-located events! *Attending the Welcome Reception is included in registration fee.*

Wine and beer tastings from 5:30 p.m.–6:30 p.m. See page 99 for more information!

**PLEASE NOTE,** during the expo welcome reception a Remote Pilot Vehicle will be on the tradeshow floor taking aerial shots of the event.

CONFERENCE SOCIAL EVENT

**Tuesday, May 12 at the Queen Mary • 7:00 p.m.–10:00 p.m.**

Enjoy an evening with friends and colleagues during this year’s exciting social event aboard the Queen Mary! Join us for a reception style dinner with live entertainment, two drink tickets and a cigar bar. Don’t miss out on this one-of-a-kind social event that won’t disappoint! All Aboard! Cocktail attire optional.

Transportation included.

*Ticket required and sold separately—tickets available for sale at Registration through Monday at 12:00 p.m.*

TRANSPORTATION SCHEDULE

**Transportation to the Queen Mary from the Hyatt Regency Long Beach** will run on a flow with the first bus departing at 6:45 p.m.

**Transportation to the Queen Mary from the Hyatt the Pike Long Beach** departing at 6:45 p.m. and 7:30 p.m. After 7:30 p.m., buses will depart from the Hyatt Regency Long Beach.

**Transportation leaving the Queen Mary** will be available until 10:15 p.m. and will drop off at the Hyatt Regency Long Beach and Hyatt the Pike Long Beach

STAY CONNECTED AT THE SHOW IN THREE DIFFERENT WAYS!

1. Follow show news on Twitter or share your photos and videos by using hashtag **#2015MegaShow**
2. Like the ASM International Facebook page
3. Download the official AeroMat, ITSC and IMS Event App (for Apple and Android devices)

The app provides instant access to show information you need to know!

- Complete technical program including abstracts
- Exhibitors information booth locations
- Surveys
- Contact fellow attendees
- Announcements and maps for quick navigation

**App Name: MegaShow 2015**

See Registration for mobile app technical support
Meet poolside at the Hyatt Regency Long Beach (headquarter hotel) at 5:45 a.m. for registration. Fun Run/Walk starts at 6:00 a.m. with energizing refreshments poolside upon competition of 5k route.

This 5k route offers some of the best waterfront views in Downtown Long Beach.

Pre-registration is required.
Meet poolside at the Hyatt Regency Long Beach (headquarter hotel) at 5:45 a.m. for registration. Fun Run/Walk starts at 6:00 a.m. with energizing refreshments poolside upon completion of 5k route. This 5k route offers some of the best waterfront views in Downtown Long Beach.

Map may not be to exact scale.

Distances Approximated.
MONDAY, MAY 11
1:30 p.m.–3:00 p.m.

Dr. John Grotzinger
Chief Scientist and Head of Strategic Planning for Mars Rover Mission

Dr. John Grotzinger is the chief scientist and head of strategic science planning for NASA's $2.5 billion Curiosity rover mission to Mars, which riveted the country with its dare-devil landing. A veteran geologist of more than 30 years of exploration of Earth and Mars, Grotzinger has led expeditions to the far corners of the globe. He now heads the most visible mission in the history of robotic space exploration in its search for evidence of past life. He received NASA's prestigious Outstanding Public Leadership Medal for the unprecedented success of the mission, and Popular Mechanics named him No. 2 on its list of "10 Innovators who Changed the World." Discover magazine also listed the Mars Curiosity rover giving researchers unprecedented access to the Red Planet as No. 1 in its list of the "Top 100 Science Stories of 2013." Exclusively represented by Leading Authorities speakers bureau, Grotzinger discusses strategic planning, motivating and leading teams working under intense pressure, and the need to take on a "grand challenge" while sharing awe-inspiring and cutting-edge stories, video, and photos about space and unexplored territories of Mars. Grotzinger combines tales of adventure and discovery with lessons in leadership, consensus building, and novel applications of technology that is literally out of this world.

Mars Exploration. Leading a team of more than 450 scientists, Grotzinger is responsible for future planning, parallel operations, determining Curiosity's exploratory sites, and ensuring smooth and productive collaboration between several independent engineering teams—a key element of mission success. The rover’s objectives include characterization of the Martian landscape, measuring radiation levels to enable future human exploration, and analyzing soil and rock samples in an effort to find environments that could have once supported life. Since 2003, Grotzinger also has worked on the Spirit and Opportunity rovers. In 2004, he and Opportunity rover team made the discovery of evidence for liquid water on ancient Mars based on image, mineralogical, and chemical data. In 2007, he became a member of the HiRISE camera imaging team on Mars Reconnaissance Orbiter.

Geological Roots. Grotzinger is interested in the evolution of surficial environments of Earth and Mars. Because the planets are thought to have had similar early climates and geologic conditions, his work on early Earth helps guide Curiosity's exploration of early environments on Mars. He has led field missions to arctic Canada, Siberia, Africa, and Oman and has worked closely with the oil and gas industry, serving as a consultant for frontier exploration in the Middle East. For his great contributions to understanding the co-evolution of life and environment on early Earth, Grotzinger received the Charles Doolittle Walcott Medal from the National Academy of Sciences—awarded once every five years. For his work in the geology and geochemistry of hydrocarbon exploration, he was honored with the 2012 Halbouty Award of the American Association of Petroleum Geologists.

Education and Professorships. Grotzinger was the Robert Shrock professor of geology at MIT, were he worked from 1988–2005. There, he was also named the Waldemar Lindgren distinguished scholar. He moved to the California Institute of Technology (Caltech), where he was the Moore distinguished scholar in 2004 and the Fletcher Jones professor of geology starting in 2005. He was also a distinguished visiting scientist at NASA's Jet Propulsion Laboratory from 2004–2006.

TUESDAY, MAY 12
1:00 p.m.–3:30 p.m.

1:00–1:45 p.m. – Mr. Humberto Luiz de Rodrigues Pereira
1:45–2:00 p.m. – ITSC/TSS Award Presentations
2:00–2:45 p.m. – Dr. Robert Vaßen
2:45–3:30 p.m. – Dr. Frank Mücklich

Mr. Humberto Luiz de Rodrigues Pereira,
VP Engineering and Technology with Embraer
Presenting: "A Vision on how advanced Materials may address the challenges of future aircraft"

Abstract: The aeronautical sector is characterized by low production rates, high competition which demands better product performance, lower costs, frequent product evolution and flexible manufacturing systems.
In addition, environmental aspects such as emissions, noise and new cabin comfort standards will continue to be important drivers for new technologies.

This presentation intends to bring a vision on how advanced materials and future manufacturing processes may address these challenges.

**Biography:** Humberto Luiz de Rodrigues Pereira, Vice-President, Engineering—Executive Jets, is responsible for the development, certification and support the operation to all executive aviation products.

Humberto has been working for Embraer for 25 years. He started his carrier as a stress engineer, working in the development of several products such as EMB-120—Brasilia and EMB-312—Tucano. He led the ERJ-145 Structural Engineering Team being responsible for the design of the entire primary structure of this airplane.

In 1998, he was assigned Manager of Structural Engineering responsible for all Embraer airplanes, including EMBRAER 170 and EMBRAER190. In 2001, he became a member of the Aviation Rulemaking Advisory Committee.

He was assigned Product Support Engineering Director in 2005, involved in all engineering aspects related to Embraer airplanes in operation. In 2007 he took over as Director of Development Engineering dedicated to all Embraer development products.

Since 2009, he has taken over the position of Director of Engineering for Executive Aviation Market, responsible for all products, including aircrafts in development phase and those which are in operation. Among these aircrafts, there are in operation: Phenom 100, Phenom 300, Lineage 1000, Legacy 600 and Legacy 650 and, finally, at full development is the Legacy 500.

He was graduated from Federal University of Minas Gerais (Univesidade Federal de Minas Gerais – UFMG) in Mechanical Aeronautical Engineering and specialized in Aeronautical Structures at Aeronautics Technological Institute (Instituto Tecnológico de Aeronáutica – ITA).

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**Abstract:** Thermal barrier coatings are widely used in both stationary and aero gas turbines to improve their efficiency by allowing an increase of the turbine inlet temperature. Standard manufacturing processes are atmospheric plasma spraying (APS) and electron beam – physical vapor deposition (EB-PVD). While the more expensive EB-PVD process is mainly used for the coating of highly loaded blades in aero engines due to its columnar, highly strain-tolerant microstructure, APS is the deposition method applied for most of the other applications. This deposition process gives as an excellent thermal cyclic performance due to its micro-cracked, porous microstructure. In the last decades in addition to APS advanced thermal spray methods have attracted much attention. One is suspension or solution plasma spraying which allows the deposition of fine species in the sub-micrometer range and by that the manufacture of new microstructures as highly segmented and columnar ones. Another advanced process is plasma spray—physical vapor deposition (PS-PVD) in which powderous feedstocks are evaporated and extremely strain-tolerant microstructures can be established. Besides new processes also advanced materials beyond the standard yttria stabilized zirconia (YSZ) are studied intensively. One favorite material is gadolinium zirconate which is typically applied in a so-called double layer system with YSZ underneath. This material also shows an improved resistance against Calcium Magnesium Aluminum Silicate (CMAS) attack which is also an important research topic. Further recent activities described in the talk are related to advanced bond coats, to embedded additional functionalities in the coatings and to diagnostic concepts in the thermal spray process.

**Biography:** Dr. Vaßen is Professor of Mechanical Engineering at the Ruhr-University Bochum in Germany and employed at Forschungszentrum Jülich GmbH, where he researches energy systems.
He is also a guest professor at University West, Trollhattan, Sweden.

Professor Vaßen’s research fields include thermal spray technology, protective high-temperature coatings (thermal and environmental barrier coatings), powder technology, ceramics processing, lifetime modelling, and solid oxide fuel cells and membranes.

His projects include several European projects on TBCs (SAMBA) and membranes (DEMOYS), DFG-projects on Bondcoats, TBCs and stresses in thermal spray coatings, federal government funded project on new TBCs, abradables and repair, and industrial projects on coating development and testing.

He obtained his doctoral degree in physics in 1990 at the Rheinisch-Westfälische Technische Hochschule Aachen. Robert Vaßen is author and co-author of more than 160 papers and holds more than 10 patents. He is active in different committees of the German and American ceramic society and worked as organizer and session chair in different materials conferences and workshops.

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**Abstract:** 3D microstructure characterization plays a key role for the quantitative understanding of the relationship between processing, microstructure and properties of high performing materials. However, it could not be fully exploited so far due to the lack of adequate 3D characterization techniques in some of the relevant scales. Recent progress in tomographic techniques has led to quantitative insights into the evolution of materials microstructures with gradual field of view sizes. We present hierarchical investigations for complex microstructure morphologies e.g. of an important lightweight material for automobiles – the Al-Si alloys. The interdendritic Al-Si eutectic network with its 3D shape and arrangement plays an essential role for stiffness, toughness and strain at fracture. The eutectic seeding on the atomic scale [1], the microstructural growth mechanisms on the nano scale [2] as well as their stochastic effect in the micro scale on the macroscopic properties are still under discussion and the materials are potentially far away from being optimal.


**Biography:** Frank Muecklich (Prof.Dr.-Ing.) studied Materials Science and Engineering and obtained his PhD (Dr.-Ing.) at the Freiberg University of Mining and Technology (1988). After having a leading position at the Max-Planck-Institute for Metals Research in Stuttgart he was appointed as professor and head of the Chair for Functional Materials at Saarland University (1995). Since 2008 he has also been Chairman of the European School of Materials (EUSMAT) at Saarland University. In addition to this, he has been the scientific director and CEO of the Materials Engineering Center Saarland (MECS) since 2009.

Frank Muecklich published more than 300 scientific papers, holds 12 patents and is co-author of the textbook "Statistical Analysis of Microstructures in Materials Science"(Wiley). Since 2014 he has been the Editor of “Practical Metallography”, the international journal for preparation, imaging and quantitative analysis of materials microstructures (Hanser). In 2013 he was appointed as the Scientific Chairman of Europe’s largest scientific conference in Materials Science and Engineering, the EUROMAT2013 in Seville (Spain).

His main fields of scientific interest are:

- 3D analysis of materials microstructures in the micro, nano and atomic scale
- High performing surfaces by 2D+ microstructure design and surface functionalization
- Advanced functional materials with tailored microstructures for electrical application

For his scientific work Frank Muecklich received various national and international awards such as Georg Masing Memorial Prize, Werner Koester Prize, Roland Mitsche Prize, Alfred Krupp Prize. In 2009 he was appointed as the Morton Antler Memorial Lecturer of IEEE in Vancouver. In 2012 he was awarded the Loehn Prize of the Steinbeis foundation for the most successful transfer of science into business. In 2013 he received the Copper Prize of the German Copper Institute.
BASE YOUR DESIGNS ON SOLID INFORMATION YOU CAN TRUST

Your materials projects can only be successful if they’re built on credible information. So don’t risk your reputation on information you’ve sourced from the internet. ASM’s technical reference books have been peer-reviewed by materials experts across all industries. We maintain the world’s most respected library on materials sciences, covering both common and niche topics, like these great titles.

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- **Steels: Processing, Structure, and Performance**, 2nd Edition
- **Understanding How Components Fail**, 3rd Edition

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Check out our full catalog online for ASM’s complete line of materials information resources. asminternational.org/techbooks
On behalf of the Organizing Committee I am honored to welcome you to AeroMat 2015 in sunny Long Beach, California. This year the event was organized jointly with the International Thermal Spray Conference (ITSC 2015) and Microstructural Characterization Aerospace Materials and Coatings (IMS 2015). This provides unique opportunity to become acquainted with not only the latest breakthroughs in aerospace materials/manufacturing processes but also a variety of surface enhancement treatments and latest developments in microstructural characterization.

For the past twenty-six years, AeroMat has maintained a status of being the preeminent annual forum that facilitates the interchange of pertinent technical information on aerospace industry materials and processes. We continue with the theme “The Latest Word in Aerospace Materials.” To support this ambitious theme, this year’s venue will include over 160 technical presentations, plenary speakers featuring the aerospace industry’s most preeminent leaders in aerospace materials and a diverse exposition. You can expect high-quality papers covering topics in aluminum, magnesium, titanium, thermomechanical processing, high-strength steels, high-temperature alloys, welding and joining, coatings and surface treatments, and materials and processes for space applications; plus, a very large session on additive manufacturing. Our plenary speakers representing NASA and aircraft builders will cover topics ranging from Curiosity Mars Rover robotic space exploration in its search for evidence of past life to an overview of the development, certification and support for the operation of all executive aviation products. The exposition has been expanded to a record 80 companies and organizations showcasing state-of-the-art products/services.

As chairman of the organizing committee, I was privileged and honored to work with an extremely dedicated team of aerospace and material science professionals. At the same time, we are indebted to the ASM team who provided tremendous support and guidance during the past eleven months. We are hopeful that you will have an opportunity to network, establish new technical/business contacts, become familiar with/introduce new technologies or enjoy the exhibits. With that, the entire team welcomes you to Long Beach and AeroMat 2015 and wishes for a productive experience.

Michael Niedzinski
Chairman Aeromat 2015
# 2015 AEROMAT ORGANIZING COMMITTEE

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NAVAIR - FRC EAST

## MEMBERS

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ADDITIVE MANUFACTURING
The Additive Manufacturing (AM) sessions will in-clude presentations on recent advances in metallic AM processes and technologies in the aerospace, medical and transportation industries. Presentations will cover AM methods, applications, materials & processes, mechanical properties as well as design practices. Presentations on AM methods will cover the various deposition processes used to produce metallic components. Applications will include both prototype and production implementation and examples of associated lessons learned. Secondary processing required, including heat treatment, surface finishing, repair & non-destructive inspection (NDI) will be covered in the Materials & Processes session. AM design practice topics will include design criteria, modeling & simulation techniques, analysis methods, certification requirements and the use of reverse engineering.

ADVANCED ALUMINUM ALLOYS—LIGHT HIGH PERFORMANCE ALLOYS AND STRUCTURES
The “Advanced Aluminum Alloys—Light High Performance Alloys and Structures” sessions cover research, development and applications of Aluminum alloys and Aluminum alloy-based hybrid materials (e.g., FML, MMC). The technical presentations cover subjects ranging from alloy development, processes involved in the manufacture of aluminum products and structures, and evaluations of the performance of structural subcomponents and components. Focus areas include the development, processing, manufacture and application of recently commercialized aluminum alloys including Al-Li alloys; the corrosion and durability properties of new aluminum alloys; and new design and manufacturing technologies aimed at reducing cost of aluminum and hybrid structures.

COMPOSITE MATERIALS, PROCESSES AND STRUCTURES
Research and development of composite materials, processes and structures have continued their high rate of growth and application for advanced aircraft designs. While the vast majority of composite materials systems are fiber-reinforced polymer-matrix, there is also continued expansion into metal and ceramic matrices for targeted applications (e.g. elevated temperatures, high compression loads, unusual environments, etc.) Many of the implementation challenges have a common thread originating in either unknown material behavior or in the transition to manufacturing where large-scale or high rate processes are employed. Concurrently, new composite materials are continually evolving, holding promise for even better performance (and more challenges). These composite sessions will cover current work ranging from fundamental science and technology development to process development and fabrication, and include: matrix and reinforcement materials development, processing and process modeling, dimensional control, applications, defect management and detection, tooling methods, surface preparation, characterization (including microscopy and diffraction methods), cost and cost modeling, additive fabrication methods and cross-sector (commercial, defense, consumer and space) market transitions.

EMERGING MATERIALS AND PROCESSES
Emerging materials and process technologies allow the aerospace industry to improve performance and affordability in all life-cycle phases of aerospace systems. These sessions will focus on new alloy developments and novel processing techniques across the range of aerospace materials.

FAILURE ANALYSIS OF AEROSPACE COMPONENTS
Failure analysis has been used as a tool to enhance aviation safety throughout the decades. It draws on a variety of science and engineering disciplines in order to identify root causes and make recommendations to avoid repeat offenses. As materials, processes, and aircraft designs evolve, new methods combined with traditional practices are required to provide solutions to the aviation industry. This session will highlight a variety of recent cases with a special presentation on the future of aviation failure analysis.

HIGH TEMPERATURE & TURBINE MATERIALS
High temperature materials and their advancement are often on the critical path for development of propulsion systems, aerospace vehicles, and gas turbines for power generation. While meeting performance and structural integrity requirements is essential, accelerating development of high temperature materials has meant an increased reliance on emerging Integrated Computational Materials Engineering (ICME) methods. Advances in alloys, ceramics, intermetallics and coatings for high temperature applications will be presented, with emphasis on how ICME has become enabling to cost-effective, rapid development and implementation.
INTEGRATED COMPUTATIONAL MATERIALS ENGINEERING (ICME)

“Integrated Computational Materials Engineering” (ICME) methods, as enabled by industry and government efforts such as the “Materials Genome Initiative” (MGI), have garnered increased attention over the past several years. The AeroMat 2015 ICME session covers research related to the computational modeling and accelerated development of advanced new aerospace materials. Particular areas of interest include: (1) the development of process-structure and structure-property computational models and their integration into materials design practice; (2) the optimization of a materials’ production or processing path; and (3) the rapid development and qualification of new aerospace materials including structural alloys, lightweight materials, castings, corrosion-resistant materials, high temperature materials and coatings. A broad range of talks, both from the research community and from the commercialization (industry) perspective, is envisioned.

NON DESTRUCTIVE EVALUATION TECHNIQUES IN AEROSPACE

The significant developments in manufacturing, welding and joining and additive manufacturing processes in the last 15 years has led to even better non-destructive evaluation techniques to assist the aerospace industry. This session will review the following techniques: acoustic wave, laser ultrasonics, quantitative percussion diagnostics, phased array ultrasonics, full matrix capture and computed tomography, used to inspect a range of metallic and non-metallic material components for the airframe and aircraft engine market.

SURFACE ENGINEERING AND FATIGUE LIFE ENHANCEMENT

Fatigue is involved in the majority of aerospace structural failures. In some applications, the fatigue requirements are greater than that which the material alone can provide. In these cases, fatigue life enhancement techniques are often employed. These techniques include surface microstructural modification, metallic coatings and methods to induce beneficial surface residual compressive stresses. The AeroMat 2015 Surface Engineering and Fatigue Life Enhancement session covers research and commercial advances based on these approaches.

SUSTAINABILITY OF AEROSPACE MATERIALS & PROCESSES

These sessions aim to highlight and report on challenges in environmental sustainability particular to the aerospace industry, elucidate leading sustainable approaches and recommend best practices. Experts will share their knowledge and discuss design of materials and processes for improved recyclability, design for environment (DFe) and processing to recover manufacturing scrap and end of life (EoL) parts for new resources. Challenges in maintaining premium chemistry control and preventing impurity pickup and concentration are of special interest for high-performance aerospace alloys (magnesium, aluminum, titanium, ferrous alloys and superalloys). Similarly, methods of addressing fiber recovery from reinforced thermoplastics and thermostet polymer composites are highly desirable topics. Cost modeling and life cycle assessment likewise appropriate. The evolution and future of recycling methods, inline scrap characterization and control, and modern melting methods also fit well in this program. Other topics of interest include: renewable materials sources, biomaterials, EoL dismantling, aircraft DfE, and environmental legislation and controls.

TITANIUM ALLOY TECHNOLOGY

These processing and metallurgy sessions will provide an update on the latest titanium aerospace technologies covering near-alpha, alpha/beta and beta alloys across a wide range of topics and new developments. There is an interesting study on oxidation behavior of near-alpha alloys at 950C to further the understanding of this problem for high temperature applications and another study analyzing the effect of heat treatment and microstructure, including a2 formation, on mechanical properties. Other studies include analyses of the effects of thermomechanical processing and microstructure on the properties of several alpha-beta and beta alloys, use of hydrogen as a temporary alloying addition, powder processing and friction stir welding.

WELDING AND JOINING

Welding technologies have been used in aircraft engine component manufacture for decades, but in more recent years there has been an increase in laser welding, friction welding and adhesive hybrid bonding for airframe manufacture in addition to the more conventional riveting technology. These technologies are continuing to develop and improve, and are being used for higher load applications, and in areas where dissimilar material joints are beneficial to the design for weight saving and performance requirements. The Welding sessions cover many areas of friction, power beam and fusion welding technologies, and adhesive hybrid bonding for a variety of aircraft and space applications.
## PROGRAM AT-A-GLANCE

<table>
<thead>
<tr>
<th>Monday May 11</th>
<th>Tuesday May 12</th>
<th>Wednesday May 13</th>
<th>Thursday May 14</th>
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<td>Additive Manufacturing I</td>
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<td>3:30 p.m.–5:30 p.m.</td>
<td>4:00 p.m.–5:40 p.m.</td>
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<tr>
<td>Advanced Coatings for the Aerospace Industry (JOINT SYMPOSIUM with ITSC)</td>
<td>Thermal Barrier Coatings (TBCs)</td>
<td>Engineering, Protection and Repair of Aircraft Structural Parts 1</td>
<td>Bond Coat Development for TBCs</td>
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<td>Composite Materials and Structures</td>
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<tr>
<td>Emerging Materials and Processes</td>
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<td>Recent Developments in Ferrous Alloys</td>
<td>Failure Analysis of Aerospace Components</td>
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<td>Failure Analysis of Aerospace Components</td>
<td>High Temperature and Turbine Materials I</td>
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<td><strong>Integrated Computational Materials Engineering (ICME)</strong></td>
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<td>Non Destructive Evaluation Techniques in Aerospace</td>
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<td>Plenary</td>
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<td><strong>Surface Engineering and Fatigue Life Enhancement</strong></td>
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<td><strong>Sustainability of Aerospace Materials &amp; Processes</strong></td>
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<td><strong>Titanium Alloy Technology</strong></td>
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<td>Welding and Joining</td>
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## NETWORKING OPPORTUNITIES

### Monday
- **Morning Refreshment Break**: 10:00 a.m.–10:30 a.m., Meeting Space Foyer
- **Lunch**: 12:00 p.m.–1:15 p.m., Exhibit Halls A&B
- **Afternoon Refreshment Break**: 3:00 p.m.–3:30 p.m., Exhibit Halls A&B
- **Expo Welcome Reception**: 5:30 p.m.–7:00 p.m., Exhibit Halls A&B

### Tuesday
- **Morning Refreshment Break**: 10:00 a.m.–10:30 a.m., Exhibit Halls A&B
- **Lunch**: 12:00 p.m.–1:00 p.m., Exhibit Halls A&B
- **Afternoon Refreshment Break**: 3:30 p.m.–4:00 p.m., Exhibit Halls A&B
- **Social Event***: 7:00 p.m.–10:00 p.m., Queen Mary

### Wednesday
- **Morning Refreshment Break**: 10:00 a.m.–10:30 a.m., Exhibit Halls A&B
- **Allied Facility Tour**: 10:45 a.m.–1:15 p.m., departing from Hyatt Regency. Preregistration required.
- **Afternoon Refreshment Break**: 3:00 p.m.–3:30 p.m., Exhibit Halls A&B

### Thursday
- **Morning Refreshment Break**: 10:00 a.m.–10:30 a.m., Meeting Space Foyer

*Ticket Sold Separately

## EXPOSITION HOURS/ACTIVITIES

<table>
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<tr>
<th>Monday</th>
<th>12:00 p.m.–7:00 p.m.</th>
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<tr>
<td>V.I.P. Expo Tour</td>
<td>10:15 a.m.–11:15 a.m. (qualified attendees were notified regarding acceptance.)</td>
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<tr>
<td>Lunch</td>
<td>12:00 p.m.–1:00 p.m.</td>
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<tr>
<td>Plenary</td>
<td>1:30 p.m.–3:00 p.m.</td>
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<td>Refreshment Break</td>
<td>3:00 p.m.–3:30 p.m.</td>
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<tr>
<td>Welcome Reception</td>
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<th>Tuesday</th>
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<td>Refreshment Break</td>
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<tr>
<td>AeroMat Plenary</td>
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Lunches provided Monday and Tuesday on the Exhibit Floor. Attenees on own for lunch Wednesday.

## EDUCATION SHORT COURSES

**Thursday, May 14th at the Hyatt Regency Long Beach**

- Additive Manufacturing Systems
- Friction Stir Welding & Processing

See page 42 for course description.

*Education Short Course Registration opens at 8:00 a.m. in the Seaview Foyer at the Hyatt Regency Long Beach*
On behalf of ASM International®, we would like to thank the Organizing Committee, Champions, Session Chairs, and Speakers for their time and efforts in creating an outstanding AeroMat Conference and Exposition. Abstracts can be found online at asminternational.org. See page 3 for download instructions.

Monday, May 11, 2015

Additive Manufacturing I
8:00 a.m.–12:00 p.m.
Meeting Room: 201A

Session Chair:
Mr. Hank Phelps
Lockheed-Martin
Marietta, GA USA

8:00 a.m.
Prediction of Bulk Residual Stresses in Electron Beam Additive Manufactured Aluminium Alloy:
Mr. Florent Peillon, Dr. Vu Nguyen, Dr. Yuqing Feng and Dr. Sri Lathabai, CSIRO, Clayton South, Victoria, Australia

8:30 a.m.
Further Development of a Predictive Tool for Managing Distortion in Electron Beam Additive Manufacturing:
Dr. Vu Nguyen1, Dr. Yuqing Feng1, Dr. Sri Lathabai1, Mr. John Barnes1 and Mr. Gary Coleman1, 
1CSIRO, Clayton South, Victoria, Australia, 2Metals—Welding and Forming, Boeing Research & Technology, Seattle, WA

9:00 a.m.
An integrated Global/Local Optimization Framework for Subsonic Wing with Ribs having Holes:
Mr. Shuvodeep De1, Dr. Qiang Liu2, Mr. Mohamed Jrad3 and Prof. Rakesh K. Kapania4, 1Engineering Science and Mechanics, Virginia Polytechnic Institute and State University, Blacksburg, VA, 2Aerospace and Ocean Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA

9:30 a.m.
Simulation and Characterization of Electron Beam Additive Manufacturing Ti-6Al-4V:
Ms. Jun Cao, Prof. Philip Nash and Mr. Ming Yin, Illinois Institute of Technology, Chicago, IL

10:00 a.m.–10:30 a.m.
• Refreshment Break • Meeting Space Foyer •

10:30 a.m.
Damage Tolerance Study of Curvilinearly Stiffened Panels:
Mrs. Nihal El Bourkadi1 and Mr. Mohamed Jrad2, 1Visitor student at Virginia Tech, asnieres sur seine, France, 2Engineering Science and Mechanics, Virginia Polytechnic Institute and State University, Blacksburg, VA

11:00 a.m.
Minimizing Residual Stresses in Gamma-TiAl Produced by Electron Beam Melting Process:
Dr. Ashfaq Mohammad, Mr. Muneer Khan Mohammed, Prof. Abdulrahman AlAhmari, Abdullah AlFaify and Abdulrahman Alomar, FARCAMT, Advanced Manufacturing Institute, King Saud University, Riyadh, Saudi Arabia

11:30 a.m.
Study on Interface Temperature and Plastic Strain During Ultrasonic Consolidation Process and their Influence of on Bonding Strength:
Mr. Song Zhang1, Prof. Hui Zhang2, Prof. Lili Zheng3, Ms. Xiaohua He4, Prof. Huiji Shi5 and Prof. Zhigang Yang6, 1Department of Engineering Mechanics, Tsinghua University, Beijing, China, 2Department of Engineering Physics, Tsinghua University, Beijing, China, 3School of Aerospace Engineering, Tsinghua University, Beijing, China, 4Department of Material Science and Engineering, Tsinghua University, Beijing, China

12:00 p.m.–1:15 p.m.
• Lunch • Exhibit Halls A&B •

Composite Materials & Structures
8:00 a.m.–11:30 a.m.
Meeting Room: 203A

Session Chair:
Mr. Mark Rogalski
Boeing Commercial Airplanes
Everett, WA USA

8:00 a.m.
Degradation Monitoring of Fatigued Notched Carbon Fiber Composites using DIC and Modal Techniques:
Mr. Bilel Aidi and Prof. Scott W. Case, Biomedical Engineering and Mechanics, Virginia Tech, Blacksburg, VA

8:30 a.m.
Characterization of Carbon Fiber Reinforced Thermoplastics for Induction Processing:
Mr. John Jackowski, Dr. Valentin Nemkov and Mr. Robert C. Goldstein, Fluxtrol Incorporated, Auburn Hills, MI

9:00 a.m.
Study of Fiber Pull-Out Characterization in Drilling Carbon Fiber Reinforced Polymers:
Mr. Sina Alizadeh Ashrafi and Dr. Dave Kim, Washington State University Vancouver, Vancouver, WA
9:30 a.m.  
The Multi-Scale Modeling of Failure of Continuous Fiber Composites for Virtual Allowables: Mr. Robert Schmitz¹, Mr. Philippe Hebert² and Dr. Benoit Bidaine³, ¹e-Xstream Engineering, Denver, CO, ²e-Xstream Engineering, Mont-Saint-Guibert, Belgium

10:00 a.m.–10:30 a.m.  
• Refreshment Break • Meeting Space Foyer •

10:30 a.m.  
An Overview of the NASA Composite, Liquid Hydrogen Cryotank Technologies and Demonstration: Mr. Robert Boucher, Mr. Daniel E. Rivera, The Boeing Company, Boeing Research and Technology, Huntington Beach, CA

11:00 a.m.  
Quantitative Full Survey Chemical Analysis and Distribution Measurement of Impurities in Novel Ceramic Matrix Composites: Dr. Xinwei Wang, Dr. Karol Putyera and Mr. Christian Iversen, EAG—NY, Evans Analytical Group LLC., Liverpool, NY

12:00 p.m.–1:15 p.m.  
• Lunch • Exhibit Halls A&B •

High Temperature and Turbine Materials I  
8:00 a.m.–11:30 a.m.  
Meeting Room: 202B

Session Chair:  
Mr. Eli Ross  
UTC Pratt & Whitney  
East Hartford, CT USA

8:00 a.m.  
The Ever-Changing, Never-Ending Nature of Superalloy Development: Dr. John de Barbadillo, Research and Development, Special Metals, Huntington, WV

8:30 a.m.  
Effects of Prior Inelastic Strain and Stress Concentrations on Fatigue Crack Nucleation and Propagation Behavior in High Pressure Turbine Disc Materials: Mr. Robert Warren, Institute of Structural Materials, Swansea University, Swansea, United Kingdom

9:00 a.m.  
Considerations in the Fatigue Lifing of a High Strength Nickel Alloy: Ms. Emily Duffy¹, MT Whittaker¹, N Barnard¹, B Cockings¹ and T Hyde², ¹College of Engineering, Institute of Structural Materials, Swansea, United Kingdom, ²Rolls Royce plc, Derby, United Kingdom

9:30 a.m.  
Evolution and Stability of the Two-Phase γ-γ′ Microstructure in Co-Al-W Alloys: Dr. Eric Lass, National Institute of Standards and Technology, Gaithersburg, MD

10:00 a.m.–10:30 a.m.  
• Refreshment Break • Meeting Space Foyer •

10:30 a.m.  
Solid State Synthesis and Characterization of Mixed Rare Earth Hexaaluminates: Dr. Armen Kuzanyan¹, Dr. Karine Hovhanessyan², Georgi Badalyan³, Dr. Atom Yeganyan², Prof. Ashot Petrosyan³ and Prof. Vassilis Stathopoulos³, ¹MS, Institute for Physical Research, National Academy of Sciences, Ashtarak, Armenia, ²LSM, Institute for Physical Research, National Academy of Sciences, Ashtarak, Armenia, ³Department of Electrical Engineering, Technological Educational Institute of Sterea Ellada, Psachna Chalkida, Greece

11:00 a.m.  
High Temperature Oxidation/Sulfidation of Superalloy Haynes 230: Mr. Manuel Lira¹, Dr. Facundo Almeraya Calderon, Dr. Patricia Zambrano Robledo¹, Dr. Citlalli Gaona Tiburcio¹ and Dr. Alberto Martinez Villafañe¹, ¹Universidad Autonoma de Nuevo Leon, San Nicolas de los Garza, Mexico, ²Corrosion, Centro de Investigación e Innovación en ingeniería Aeronáutica-FIME-UANL, Apodaca N.L., Mexico, ³Metalurgia, Centro de Investigacion en Materiales avanzados, Chihuahua, Mexico

12:00 p.m.–1:15 p.m.  
• Lunch • Exhibit Halls A&B •

Suspension/Solution and Plasma-Spray PVD TBCs—Novel TBC Materials  
8:00 a.m.–12:10 p.m.  
Meeting Room: 102A

Session Chairs:  
Dr. Rogerio S. Lima  
National Research Council of Canada (NRC)  
Boucherville, QC Canada

Mr. Brian Hazel  
Pratt & Whitney USA  
East Hartford, CT USA

8:00 a.m.  
Columnar Suspension Plasma Spray Thermal Barrier Coatings: Influence of Suspension Properties and Bond Coat Preparation: Dr. Nicholas Curry¹, Dr. Kent VanEvery¹, Mr. Johann Susnjar¹, Mr. Stefan Björklund¹ and Todd Snyder², ¹Research and Development, Treibacher Industrie AG, Althofen, Austria, ²Progressive Surface, Grand Rapids, MI, ¹University West, Trollhättan, Sweden
8:20 a.m.
Solution Precursor Plasma Spray of Yttrium Aluminum Garnet Thermal Barrier Coatings: Dr. Eric Jordan1, Dr. Maurice Gell1, Dr. Jiwen Wang2, Chen JiAng, Mr. Jeffrey Roth1 and Mr. Rishi Kumar3, 1School of Mechanical Engineering, The University of Connecticut, Storrs, CT, 2Hifunda LLC, Storrs, CT, 3MSE, University of Connecticut, Storrs, CT

8:40 a.m.

9:00 a.m.
Thermal Barrier Coatings Performed by Suspension Plasma Spraying: Development and Characterization: Mr. Benjamin Bernard1,2, Dr. Luc BianChi1, Mr. André Malie3, Dr. Vincent Schick2 and Dr. Benjamin Remy2, 1CEA DAM, Monts, France, 2Laboratoire d’Energétique et de Mécanique Théorique et Appliquée (LEMTA/CNRS), Vandœuvre-lès-Nancy Cedex, France, 3Safran Snecma, Châtellerault cedex, France

9:20 a.m.
Thermal Transport Properties of Columnar Structured Zirconia Coatings Deposited by Suspension Plasma Spraying Method: Prof. Lech Pawlowski1, Mr. Pawel Sokolowski1, Dr. Dagmar Dietrich1, Prof. Thomas Lampke1, Dr. Leszek Latka1 and Mr. David Jech1, 1SPCTS, University of Limoges, Limoges, France, 2Technical University of Chemnitz, Chemnitz, Germany, 3Chemnitz University of Technology, Chemnitz, Germany, 4University of Limoges, Limoges, France, 5Brno University of Technology, Brno, Czech Republic

9:40 a.m.
This is In Situ Synthesis of α-Alumina Layer Against CMAS (CaO-MgO-Al2O3-SiO2) Corrosion in Thermal Barrier Coatings Prepared by PS-PVD Case: Prof. Ke-Song Zhou and Mr. Xiao-Feng Zhang, New materials institute, Guangdong General Research Institute of Industrial Technology (Guangzhou Research Institute of Non-ferrous Metals), Guangzhou, China

10:00 a.m.-10:30 a.m.
- Refreshment Break - Meeting Space Foyer -

10:30 a.m.
Evaluating Conditions for Manufacturing Suspension Plasma TBCs: Dr. Kent VanEvery, Progressive Surface, Grand Rapids, MI

10:50 a.m.
Axial Suspension Plasma Sprayed Thermal Barrier Coatings: Dr. Zhaolin Tang1, G Masindo1, D Barentzen2 and Z Celler1, 1Northwest Mettech Corp., North Vancouver, BC, Canada, 2Northwest Mettech Corp., North Vancouver, BC, Canada

11:10 a.m.
Internal Stresses in Ytterbium Disilicate Multilayer Environmental Barrier Coatings With Calcium-Magnesium-Aluminosilicate Exposure: Dr. Fabian Stolzenburg1, Dr. Peter Kenesei2, Dr. Jonathan Almer2, Dr. Kang Lee3 and Prof. Katherine Faber4, 1Northwestern University, Evanston, IL, 2Argonne National Laboratory, Argonne, IL, 3Rolls-Royce Corporation, Indianapolis, IN

11:30 a.m.
Preparation and Characterization of Lanthanum Zirconate by Atmospheric Plasma Spray Coatings: Mr. Sivakumar Sankaran, Mr. Praveen Kandasamy and Dr. Gurusamy Shanmugavelayutham, Bharathiar University, Coimbatore, IA, India

11:50 a.m.
Synthesis Of Rare Earth Aluminates From Pseudoboehmite And Oxides: Mr. Wilson Hernández, UMSNH, Morelia, Mexico

12:10 p.m.-1:15 p.m.
- Lunch - Exhibit Halls A&B -

Welding and Joining I
8:00 a.m.—10:00 a.m.
Meeting Room: 202C

Session Chair:
Mr. Fernando Fernandez
Embraer
São José dos Campos, Brazil

8:00 a.m.
Bond PTFE and Metals Together: Dr. Lei Wang, Dr. Chris Yun and Mr. Petter Dutton, Aerospace, Defense & Marine, TE Connectivity, Menlo Park, CA

8:30 a.m.
Development of Friction Stir Welding of Titanium Alloys for Spacecraft Propellant Tanks: Dr. Richard Freeman1, Dr. M. J. Russell2, Mr. A. Norman3 and Dr. Tommaso Ghidini4, 1TWI Ltd, Cambridge, United Kingdom, 2Friction & Forge Processes Group, TWI Ltd, Cambridge, United Kingdom, 3European Space Agency
9:00 a.m.
Influence of the Pin Shape on the Flow Characteristics of the Plasticity Metal in the Friction Stir Welded Al-Alloy: Prof. Li Xing, Mr. Chaoying Yan and Prof. liming ke, NanChang HangKong University, NanChang, JiangXi, China

9:30 a.m.
Linear Friction Welding (LFW) of Aircraft Structural Components in High Strength Aluminium Alloys: Dr. Richard Freeman1, Dr. M. J. Russell2 and Mr. Dick Andrews2, 1TWI Ltd, Cambridge, United Kingdom, 2Friction & Forge Processes Group, TWI Ltd, Cambridge, United Kingdom

10:00 a.m.–10:30 a.m.
• Refreshment Break
• Meeting Space Foyer

Functional Coatings
8:30 a.m.–12:00 p.m.
Meeting Room: 202A

Session Chair:
Mr. Brian Boyette
NAVAIR
Cherry Point, NC USA

8:30 a.m.
Beaker to Bomber – Computational Modeling Reduces Technical and Commercial risk in Transitioning Promising Coating Technologies from the Laboratory to Full Scale: Dr. Alan Rose and Dr. Keith Legg, Corrdesa LLC, Newnan, GA

9:00 a.m.
Fatigue Response of Common Conversion Coatings on Al7075: Mrs. Molly Walters1, Dr. Kumar Jata2, Mr. W. John Porter1 and Dr. Dennis J. Buchanan1, 1University of Dayton Research Institute, Dayton, OH, 2Materials & Manufacturing Directorate, AFRL/RXCM, Wright-Patterson AFB, OH

9:30 a.m.
Tantalum Diffusion Layer for Extremely Corrosive Environments: Dr. Jacob J. Stiglich, Mr. Dean Gambale and Mr. Brian Williams, Ultremat, Pacoima, CA

10:00 a.m.–10:30 a.m.
• Refreshment Break

10:30 a.m.
Virtual Design of Inhibited Primers: Prof. Ivan Cole1, Dr. Erik Sapper2 and Dr. Joseph Osborne2, 1CSIRO, Melbourne, Australia, 2Boeing Research & Technology, St. Louis, MO
10:30 a.m.
Integrated Computational Materials Design (ICME) of Co-based Cu-Be Alternative for Aerospace Bushing Applications: Mr. David Snyder, Dr. Jiadong Gong, Dr. James Saal and Dr. Jason Sebastian, QuesTek Innovations, LLC, Evanston, IL

11:00 a.m.
Trends in Segregation Energies and their Application to Embrittlement and Creep: Mr. Michael A. Gibson and Christopher A. Schuh, Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA

12:00 p.m.–1:15 p.m.
• Lunch • Exhibit Halls A&B •

Monday Plenary Session
1:30 p.m.–3:00 p.m.
Exhibit Halls A&B

1:30 p.m.
Dr. John Grotzinger, Chief Scientist and Head of Strategic Planning for the Mars Rover Mission

3:00 p.m.-3:30 p.m.
• Refreshment Break • Exhibit Halls A&B •

Advanced Aluminum Alloys-Light High Performance Alloys and Structures I
3:30 p.m.–5:30 p.m.
Meeting Room: 203A

Session Chair:
Mr. Roy Nash
Kaiser Aluminum
Spokane, WA USA

3:30 p.m.
High Performance Alcoa Thick Gauge Products for Next-Generation Aircraft: Dr. Julien Boselli¹, Ms. Diana Denzer¹, Dr. Lynne M. Karabin¹, Dr. Gary Bray¹, Dr. Jay Goodman¹, Ms. Heather Watson², Ms. Ellahe-Naz Farhangnia³, Dr. Carolyn Small¹ and Mr. Gregory Venema⁴, ¹Alcoa Technical Center, Alcoa Center, PA, ²Alcoa Forged Products, AFE, Cleveland, OH, ³Alcoa Inc, Birmingham, United Kingdom, ⁴Alcoa Inc, Davenport, IA

4:00 p.m.
New KaiserSelect® Products for Aerospace Applications: Mr. Jason Scheuring, Dr. Philippe Gomiero, Dr. Zhendong (Steven) Long, Dr. Florence Baldwin and Mr. Roy Nash, Research and Development, Kaiser Aluminum, Spokane, WA

4:30 p.m.
Novel Wing Cover Solutions for Commercial Aircraft: Mr. Tristan Crawford¹, Dr. Timothy Warner¹, Ms. Géaëlle Pouget², N Bayona-Carrillo² and A. Bigot³, ¹CRV, Constellium LLC, Voreppe, France, ²Constellium Research Center, Voreppe, France

5:00 p.m.
Development of Al-Li 2050 and 2195 forgings at Weber Metals: Dr. Tony Yao¹, Mr. Mark Timko¹ and Mr. Michael Niedzinski⁵, ¹Metallurgy, Weber Metals, Paramount, CA, ⁵Constellium, South Barrington, IL

5:30 p.m.–7:00 p.m.
• Expo Welcome • Reception Exhibit Halls A&B •

High Temperature and Turbine Materials II
3:30 p.m.–5:30 p.m.
Meeting Room: 202B

Session Chair:
Dr. John Foltz
ATI
Albany, OR USA

3:30 p.m.
Life Prediction Model of Air Plasma Sprayed Thermal Barrier Coatings: Dr. Prakash Patnaik¹ and Dr. Kuiying Chen¹, ¹Gas Turbine Laboratory, National Research Council Canada, Ottawa, ON, Canada

4:00 p.m.
Investigation of Cold Sprayed Bond Coat: Microstructure and Oxidation Behavior: Dr. Mo Yandouzi¹, Mr. Deliang Guo² and Prof. Bertrand Jodoin¹, ¹Mech. Eng., University of Ottawa (uOttawa), Ottawa, ON, Canada, ²Mech. Eng., University of Ottawa, Ottawa, ON, Canada

4:30 p.m.
Integrated Computational Materials Engineering Development of High-Strength Molybdenum Alloys with Improved Ductility: Dr. Jason Sebastian, Mr. David Snyder, Prof. Gregory Olson and Mr. Jeff Grabowski, QuesTek Innovations, LLC, Evanston, IL

5:00 p.m.
Thermal History Paint for Temperature Profiling of Critical Components: Dr. Christopher Pilgrim, Dr. Jörg Feist, Mr. Stéphane Berthier, Ms. Silvia Ara- guas and Dr. Shilpi Karmakar Biswas, Sensor Coating Systems Ltd., London, United Kingdom

5:30 p.m.–7:00 p.m.
• Expo Welcome • Reception Exhibit Halls A&B •
Integrated Computational Materials Engineering (ICME) II
3:30 p.m.—5:00 p.m.
Meeting Room: 201B

Session Chair:
Dr. Gary Bray
Alcoa Technical Center
Alcoa Center, PA USA

3:30 p.m.
Design, Qualification and Deployment of Computationally Designed Ferrium Alloys: Mr. Jeff Grabowski, Dr. Jason Sebastian and Prof. Gregory Olson, QuesTek Innovations, LLC, Evanston, IL

4:00 p.m.
MedeA—An Atomistic Simulation Environment for ICME: Dr. Clive Freeman¹, Dr. Erich Wimmer² and Dr. Paul Saxe³, ¹Materials Design, Inc., Angel Fire, NM, ²Materials Design, SARL, Montrouge, France

4:30 p.m.
A Software Architecture for Managing the Material Information Data Streams, Test Data and Model Predictions, Evident in Successful ICME Implementations: Dr. Will Marsden, Granta Design, Cambridge, United Kingdom

5:30 p.m.—7:00 p.m.
• Expo Welcome • Reception Exhibit Halls A&B •

Thermal Barrier Coatings (TBCs)
3:30 p.m.—5:30 p.m.
Meeting Room: 102A

Session Chair:
Dr. Rogerio S. Lima
National Research Council of Canada (NRC)
Boucherville, QC Canada

3:30 p.m.
Improving the Corrosion Resistance of Thermal Barrier Coatings against CMAS by Depositing top ceramic layer of Enhanced Splat Bonding: Mr. Tao Liu, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li, Dr. Xiao-Tao Luo and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

3:50 p.m.
Laser Surface Texturing Pretreatment Before Thermal Spraying—A Way to Adapt and Control The Surface Topography to the Considered Materials and the Stresses Imposed: Mr. Robin Kroemer¹, Dr. Sophie Costil¹, Dr. Jonathan cormier², Dr. Laurent Berthe³, Dr. Patrice peyre³ and Mr. Damien cour pied³, ¹IRTS-LERMPS institute, Belfort cedex, France, ²Département de Physique et Mécanique des Matériaux, Institut P’, CHASSENEUIL, France, ³Laboratoire Procédés et Ingénierie en Mécanique et Matériaux, Arts&Métiers ParisTech, Paris, France

4:10 p.m.
Concept Optimization for Coating Application and Quality of APS applied TBC on Gas Turbine Blades and Vanes: Dr. Thomas Duda and Mr. Tobias Buecklers, Alstom (Switzerland), Birr, Switzerland

4:30 p.m.
Thermal Phase Stability of Various Plasma Sprayed TBCs: Dr. Li Li¹ and Dr. Benjamin Peterson², ¹Praxair Surface Technologies, Inc., Indianapolis, IN, ²Honeywell Aerospace, Phoenix, AZ

4:50 p.m.
Novel High Sintering-Resistant Plasma-sprayed Thermal Barrier Coatings with Designed Large Two-Dimensional Inter-lamellar Voids: Dr. Tao Liu, Mr. Shan-Lin Zhang, Dr. Xiao-Tao Luo, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

5:10 p.m.
Thermal Gradient Behaviour of TBCs Subjected to a Laser Gradient Test Rig: Simulating an Air-to-Air Combat Flight: Dr. Rogerio S. Lima¹, Dr. Basil R. Marple¹ and Mr. Pierre Marcoux², ¹National Research Council of Canada (NRC), Boucherville, QC, Canada, ²Vac Aero International, Boucherville, QC, Canada

5:30 p.m.—7:00 p.m.
• Expo Welcome • Reception Exhibit Halls A&B •

Welding and Joining II
4:00 p.m.—5:30 p.m.
Meeting Room: 202C

Session Chair:
Dr. Richard Freeman
TWI Ltd
Cambridge, United Kingdom

4:00 p.m.
Damage Tolerance Analysis of Dissimilar Butt-Joints Obtained by Stationary Shoulder Friction Stir Welding: Mr. Alessandro Barbini¹, Dr. Jorge F. dos Santos¹ and Prof. Norbert Huber², ¹Solid-State Joining Processes, Helmholtz-Zentrum Geesthacht GmbH, Institute of Materials Science, Materials Mechanics, Geesthacht, Germany, ²Helmholtz-Zentrum Geesthacht GmbH, Institute of Materials Science, Materials Mechanics, Geesthacht, Germany
4:30 p.m.
Manufacturing of a Novel Upper Wing Cover Demonstrator Using Friction Stir Welding: Dr. Frank Eberl¹, Mr. K. Paul Smith², Mr. Julien Laye¹, Mr. Fernando Fernandez³, Mrs. Daniéle Nunes³, Mr. Marcio Cruz⁴, Mr. Marcos Miyazaki⁵, Mr. G. Aleixo⁶, Mr. Rafael Sanchez⁷ and Mr. Jose-Luis Garcia⁸, ¹Constellium LLC, Issoire Cedex, France, ²Constellium LLC, Ravenswood, France, ³R & D, Embraer, São José dos Campos, Brazil, ⁴Manufacturing Engineer, Embraer, Sao Jose dos Campos, Brazil, ⁵Helmholtz-Zentrum Geesthacht GmbH, Institute of Materials Science, Materials Mechanics, Geesthacht, Germany, ⁶AERONOVA, S.A.U., Tarazona, Spain

5:00 p.m.
Aluminum Tailor Welded Blanks – Preparing for High Volume Production: Mr. Yuri Hovanski¹, Dr. Piyush Upadhyay¹, Mr. Brandon Landino², Mr. Mark Eisenmenger³ and Dr. John Carsley⁴, ¹Applied Material Processing, Pacific Northwest National Laboratory, Richland, WA, ²Global Aerospace, Transportation, & Industrial Rolled Products, Alcoa Inc. -, Farmington Hills, MI, ³TWB Company LLC., Monroe, MI, ⁴GM Global R&D, Warren, MI

5:30 p.m.–7:00 p.m.
• Expo Welcome • Reception Exhibit Halls A&B •

Tuesday, May 12, 2015

Additive Manufacturing II
8:00 a.m.–11:00 a.m.
Meeting Room: 201A

Session Chair:
Dr. Francisco Medina
Arcam
Naperville, IL USA

8:00 a.m.
Material Properties of AS7G06 Aerospace Components Built Using Selective Laser Melting: Dr. Stephanie Giet¹, Mr. Heng Rao², Dr. Paul Romansch¹ and Prof. Xinhua Wu¹,², ¹Monash Centre for Additive Manufacturing, Notting Hill, Australia, ²Mechanical and Aerospace Engineering, Monash University, Clayton, Australia

8:30 a.m.
Mechanical and Electrochemical Evaluation of Ti-6Al-4V 3-D Printed Alloys Versus their Wrought Counterparts: Ms. Hannah Bindig¹, Dr. Paul M. Natishan¹ and Mr. Scott Olig¹, ‘Vision Point Systems in support of the Naval Research Laboratory, Washington, DC, ‘6130, Naval Research Laboratory, Washington, DC

9:00 a.m.
Tensile Deformation and Fatigue Strength of DMLS Materials: Light Metals: Dr. Todd Mower and Mr. Michael Long, MIT Lincoln Laboratory, Lexington, MA

9:30 a.m.
Manipulation and Characterization of Novel Titanium Powder for Additive Manufacturing Applications: Alexandra Kingsbury, Mr. S. Gulizia¹, Dr. Anselm Oh¹, Ms. Yingying Sun¹, Prof. Ma Qian², Dr. Y.F Yang³ and Dr. Christian Doblin¹, ¹Manufacturing Flagship, CSIRO, Melbourne, Australia, ²RMIT, Melbourne, Australia

10:00 a.m.–10:30 a.m.
• Refreshment Break • Exhibit Halls A&B •

10:30 a.m.
Selective Laser Melting (SLM) of Ti64 and Quality Control of its Products and Powder Feedstock: Prof. Xinhua Wu, Monash University, Notting Hill, Australia

12:00 p.m.–1:00 p.m.
• Lunch • Exhibit Halls A&B •

Advanced Aluminum Alloys-Light High Performance Alloys and Structures II
8:00 a.m.–12:00 p.m.
Meeting Room: 203A

Session Chair:
Mr. Michael Niedzinski
Constellium
South Barrington, IL USA

8:00 a.m.
A New 2nd Generation AlMgSc Alloy for Aerospace Applications: Dr. Sabine Spangel, Dr. Achim Bürger and Philippe Meyer, Aleris Rolled Products Germany GmbH, Koblenz, Germany

8:30 a.m.
Australian Scandium Supply – A Paradigm Shift for a Strategic Metal: Mr. Sam Riggall and Mr. John Carr, Clean TeQ Metals, Melbourne, Australia

9:00 a.m.
Advanced Product Solutions for Commercial Aircraft Fuselage Structures: Mr. K. Paul Smith¹, Dr. Frank Eberl¹, Dr. J. Chevy¹, M. Bouet-Griffon¹ and Ms. Gaëlle Pouget¹, ¹Constellium LLC, Issoire Cedex, France, ²Constellium R&D Center, Voreppe, France, ³Constellium Research Center, Voreppe, France
9:30 a.m.  
Advanced Metallic Fuselage Alloy Development:  
Dr. Paul Magnusen1, Dr. David Heard1, and Mr. Gregory Venema1,  
1Alcoa, Inc., Alcoa Center, PA, 2Alcoa Inc, Riverdale, IA

10:00 a.m.-10:30 a.m.  
• Refreshment Break  
• Exhibit Halls A&B

10:30 a.m.  
Rapid Development of a New Kaiser High Strength Al-Li Sheet Alloy for Forming Applications: Mr. Roy Nash1, Dr. Zhengdong (Steven) Long2, Dr. Florence Baldwin3, Mr. Philippe Lassince4, Mr. Jason Scheuring2 and Mr. Rob Matuska5,  
1Research and Development, Kaiser Aluminum, Spokane, WA, 2Research and Development, Kaiser Aluminum, Paris, France, 3Research and Development, Kaiser Aluminum, Heath, OH

11:00 a.m.  
Recent Progress in Understanding the Durability and Damage Tolerance of AIRWARE Products:  
Dr. Nicolas Bayona, Dr. Timothy Warner, Ms. Gaëlle Pouget, Dr. C. Sigli, Dr. J. Chevy and Mr. Bernard Bes, Constellium Technology Center, Voreppe, France

11:30 a.m.  
Assessment of Aluminum Lithium Alloys for Primary Aircraft Structures: Mr. Kevin Stonaker1, John Bakuckas1, Ian Won2, Mark Freisthler2, Mr. Bruce Thomas3 and Dr. Frank Eberl4,  
1Department of Mechanical Engineering, Helmut Schmidt University, University of the Federal Armed Forces Hamburg, Hamburg, Germany, 2Lufthansa Technik AG, Hamburg, Germany

12:00 p.m.-1:00 p.m.  
• Lunch  
• Exhibit Halls A&B

8:30 a.m.  
High-Strength and Flame-Resistant LPSO Magnesium Alloys Produced by Rapidly Solidified Powder Metallurgy Processing: Prof. Yoshimoto Kawamura, Magnesium Research Center, Kumamoto University, Kumamoto, Japan

9:00 a.m.  
Hot Forming and Superplastic Forming: Presses Evolution and New Applications in the Aerospace Industry: Mr. Guillaume Sana, R&D, ACB, Nantes, France

9:30 a.m.  
Low-Cost Thin Titanium Shape Memory Alloy Foils by Planar Flow Casting: Mr. Michael Kellam, Dr. Guangsheng Song and Dr. Daniel Liang, CSIRO Manufacturing Flagship, Clayton, Australia

10:00 a.m.-10:30 a.m.  
• Refreshment Break  
• Exhibit Halls A&B

10:30 a.m.  
CFD Simulation Approach for Quenching and Thermal Treatment Optimization: Dr. David Greif, AVL-AST d.o.o., Maribor, Slovenia

11:00 a.m.  
Electric Discharge Machining of Low Conductivity Materials: Dr. Roberto Perez, R & D, GF Machining Solutions, Geneva, Switzerland

12:00 p.m.-1:00 p.m.  
• Lunch  
• Exhibit Halls A&B

8:00 a.m.  
Cold Spraying for Aerospace Applications: Prof. Thomas Klassen1, Dr. Kurt Binder2, Dr. Maria Villa3, Dr. Frank Gärtnert, Prof. Hamid Assadi4 and Dr. Thomas M. Gartner5,  
1Department of Mechanical Engineering, Helmut Schmidt University, University of the Federal Armed Forces Hamburg, Hamburg, Germany, 2Lufthansa Technik AG, Hamburg, Germany
8:40 a.m.  
Metallization of Polymeric Substrates by Cold Spray – Is it Possible?: Dr. Julio Villafuerte¹, Dr. Jianfeng Wang¹ and Dr. Harvey Ye¹, ¹Corporated, Centerline (Windsor) Limited, Windsor, ON, Canada, ²SST, Centerline (Windsor) Limited, Windsor, ON, Canada

9:00 a.m.  
Spall Resistant HVOF Coatings: Mr. David Webb, R&D, ES3, Clearfield, UT

9:20 a.m.  
Mechanism of Calcareous Deposit formation on TSA-coated Steel Structures at Elevated Temperatures: Dr. Shiladitya Paul¹, Ms. N S Zulkfi², Dr. K Yunus³, Dr. A C Fisher² and Mr. M D F Harvey¹, ¹Materials Group, TWI, Cambridge, Cambridge, United Kingdom, ²Department of Chemical Engineering and Biotechnology, University of Cambridge, Cambridge, United Kingdom, ³Surface Engineering, TWI, Cambridge, United Kingdom

9:40 a.m.  
Improving the Adhesion Of Wear-Resistant Coatings on Aerospace Polymer Composites: Ms. Axelle Eriikh¹, Dr. Simon Goutier¹, Dr. Gordon Armstrong² and Prof. Armelle Vardelle¹, ¹European Ceramic Center, University of Limoges, Limoges, France, ²Materials and Surface Science Institute, University of Limerick, Limerick, Ireland

10:00 a.m.—10:30 a.m.  
• Refreshment Break • Exhibit Halls A&B •

10:30 a.m.  
Coaxial Laser Assisted Cold Sprayed WC–Co Coatings: Microstructure and Mechanical Properties: Mr. Praneet Talwar, Mr. Vikram Varadarajan and Prof. Pravansu Mohanty, Mechanical Engineering, UNIVERSITY OF MICHIGAN DBN, Dearborn, MI

10:50 a.m.  
Process-Property Correlation of Heat Treated Aluminium 6061 Cold Spray Coatings: Mr. Kelvin Loke, ST Kinetics Integrated Engineering Pte Ltd, Singapore, Singapore

11:10 a.m.  
Effect of Friction-stir Processing on the Wear Rate of WC-based MMC Coatings Deposited by Low Pressure Cold Gas Dynamic Spraying: Mr. Sayed Hossein Ashrafizadeh¹, Mr. Adrian Lopera¹, Dr. Adrian Gerlich¹ and Dr. André McDonald¹, ¹Mechanical Engineering, University of Alberta, Edmonton, AB, Canada, ²Mechanical and Mechatronics Engineering, University of Waterloo, Waterloo, ON, Canada

12:00 p.m.—1:00 p.m.  
• Lunch • Exhibit Halls A&B •
10:00 a.m.  
Nondestructive Determination of Bulk Residual Stresses: Dr. T. Calvin Tszeng, Santa Clara University, Santa Clara, CA

11:00 a.m.  
Non-Destructive Testing of Components Made by Selective Laser Melting: Dr. Paul Rometsch, Dr. Daniele Pelliccia, Dr. Ulf Garbe, Dr. Dacian Tomus, Dr. Stephanie Giet, Monash Centre for Additive Manufacturing, Monash University, Melbourne, Australia, 2Department of Materials Engineering, Monash University, Melbourne, Australia, 3School of Physics, Monash University, Melbourne, Australia, 4Bragg Institute, Australian Nuclear Science and Technology Organisation, Sydney, Australia

11:30 a.m.  
Detecting Contact-Type Cracks by Modulation Spectroscopy of Acoustic Waves: Dr. T. Calvin Tszeng, Santa Clara University, Santa Clara, CA

12:00 p.m.–1:00 p.m.  
• Lunch • Exhibit Halls A&B •

Titanium Alloy Technology I  
8:00 a.m.–11:30 a.m.  
Meeting Room: 201B

Session Chairs:  
Dr. Daniel G. Sanders  
The Boeing Company  
Seattle, WA USA

Mr. Robert Briggs  
The Boeing Company  
Seattle, WA USA

8:00 a.m.  
Titanium Development Needs for the Airframe Industry: A 2015 Update: Dr. James D. Cotton, Materials and Manufacturing Technology, Boeing Research and Technology, Seattle, WA

8:30 a.m.  
Deformation Studies of Titanium Wire for Fastening Systems Performance: Dr. John Foltz, ATI, Albany, OR

9:00 a.m.  
Mechanical Properties and Microstructures of Low-Cost, Friction Stir welded Ti-531C Plates for Aircraft Applications: Prof. Mitsuo Niinomi, Dr. Masaaki Nakai, Dr. Ken Cho, Dr. Kengo Narita, Prof. Yoshibo Fujii, Dr. Yoshiaki Morisada, Mr. Yoshihito Ito, Mr. Takashi Konno, Mr. Yoshio Itsumi, Dr. Hideo Oyama, Mr. Wataru Abe, Mr. Koji Asai and Dr. Kenichi Kaminuki, Institute for Materials Research, Tohoku University, Sendai, Japan, 2Joining and Welding Research Institute, Osaka University, Ibaraki, Japan, 3Kobe Steel, Ltd., Materials Research Laboratory, Kobe, Japan, 4Titanium Research and Development section, Titanium Division, Iron & Steel Business, Kobe Steel, Ltd., Takasago, Japan, 5Titanium Research Laboratory, Kobe Steel, Ltd., Takasago, Japan, 6Titanium Research and Development Section, Titanium Division, Iron & Steel Business, Kobe Steel, Ltd., Takasago, Japan, 7Aerospace Company, Kawasaki Heavy Industries, Ltd., Kagamigahara, Japan

9:30 a.m.  
Beta-C Titanium Alloy Revisited: Dr. Sesh Tamirisa, RTI International Metals Inc, Niles, OH

10:00 a.m.–10:30 a.m.  
• Refreshment Break • Exhibit Halls A&B •

10:30 a.m.  
Sheet Roll Forming of a New High-Strength Titanium Alloy: Dr. Luis Ruiz-Aparicio, 1Market & Prod. Devl., ATI, Natrona Heights, PA, 2Wesler Profile Austria GmbH, Ybbsitz, Austria

11:00 a.m.  
Conditions of Invar-Type Effect Origin in Martensitic Titanium Alloy: Prof. Sergey Demakov, Dr. Stepan Stepanov and Prof. Anatoly Illarionov, Heat Treatment and Physics of Metals, Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg, Russia

12:00 p.m.–1:00 p.m.  
• Lunch • Exhibit Halls A&B •
8:00 a.m.
**In Situ Characterisation of the Strain Distribution Produced Around GTAW Welds: Mr. H J Stone⁴, Dr. Nicholas G. Jones⁵, Dr. Sebastien Rouquette⁶, Dr. Joe Keller⁷, Dr. David Dye⁸ and Dr. Leigh Connor⁹.**

1. Department of Materials Science & Metallurgy, University of Cambridge, Cambridge, United Kingdom, 2. The University of Cambridge, Cambridge, United Kingdom, 3. ISIS pulsed neutron and muon source, Didcot, United Kingdom, 4. Imperial College London, London, United Kingdom, 5. Diamond Light Source Ltd, Didcot, United Kingdom

8:30 a.m.
**Single-Sided Laser Beam Welding of Dissimilar T-Joints for the Aircraft Industry: Ms. Josephin Enz, Stefan Riekehr, Volker Ventzke and Nikolai Kashaeve.**

Joining and Assessment (WMF), Helmholtz-Zentrum Geesthacht—Centre for Materials and Coastal Research, Geesthacht, Germany

9:00 a.m.
**Laser Welding of Stainless Steel Weldments Applied in Aeronautical: Ms. María del Carmen Ramírez López⁴, Dr. Francisco Fernando Curiel López⁵, Dr. José Ángel Cabral Miramontes⁶, Dr. Citlalli Gaona Tiburcio⁷, Dr. Patricia Zambrano⁸ and Dr. Facundo Almeraya Calderón⁹.**

1. Corrosión, Centro de Investigación e Innovación en ingeniería Aeronáutica-FIME-UANL, Apodaca, Mexico, 2. Facultad de Ingeniería Mecánica y Eléctrica, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Mexico

9:30 a.m.
**Pi Box Weld Development: Mr. Gary Coleman⁴ and Ms. Bridgette Hannifin⁵.**

1. Metallics—Welding and Forming, Boeing Research & Technology, Seattle, WA, 2. 787 Program Support, Boeing Research & Technology, Seattle, WA

10:00 a.m.-10:30 a.m.
**Refreshment Break - Exhibit Halls A&B**

10:30 a.m.
**Microstructural and Mechanics Characterization of Stainless Steel Weldments Applied in Vanes of Missiles: Ms. María del Carmen Ramírez López⁴, Dr. Francisco Fernando Curiel López⁵, Dr. Mario Alberto Garcia Ramirez⁶, Dr. Citlalli Gaona Tiburcio⁷, Dr. Patricia Zambrano⁸ and Dr. Facundo Almeraya Calderón⁹.**

1. Corrosión, Centro de Investigación e Innovación en ingeniería Aeronáutica-FIME-UANL, Apodaca, Mexico, 2. Facultad de Ingeniería Mecánica y Eléctrica, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Mexico

11:00 a.m.
**Investigation of Alloy 2050 FSWelding: Dr. Michael Eller⁴, Matthew Champagne⁵ and Matthew Melérrine⁶.**


12:00 p.m.-1:00 p.m.
**Lunch - Exhibit Halls A&B**

1:00 p.m.
**AeroMat Plenary Presentation, Mr. Humberto Luiz de Rodrigues Pereira, Embraer, presenting on Advanced Structural Materials**

1:45 p.m.
**ITSC/TSS Award Presentations**

2:00 p.m.
**ITSC Plenary Presentation**

2:45 p.m.
**IMS Plenary Presentation**

3:30 p.m.-4:00 p.m.
**Refreshment Break - Exhibit Halls A&B**

4:00 p.m.
**Evaluation of Multiple Heat Treat Schedules on Mechanical Properties of Additively Manufactured Nickel Alloy 718: Mr. Hank Phelps, Lockheed-Martin, Marietta, GA**

4:30 p.m.
**Selective Laser Melting (SLM) of a Ni Alloy and its Components: Prof. Xinhua Wu, Monash University, Noting Hill, Australia**
5:00 p.m.
Development of the Additive Manufacturing Process for the ATI C-103™ Niobium Alloy: Dr. Noah Philips, Allegheny Technologies, Albany, OR

7:00 p.m.-10:00 p.m.
Social Event* - Queen Mary
Transportation Provided at Hyatt Regency and Hyatt Pike • *Ticket Required & Sold Separately

Engineering, Protection and Repair of Aircraft Structural Parts 2
4:00 p.m.–5:40 p.m.
Meeting Room: 102A

Session Chairs:
Dr. Li Li
Praxair Surface Technologies, Inc.
Indianapolis, IN USA

Mr. Christopher Dambra
Oerlikon Corporation
Export, PA USA

4:00 p.m.
The Effect of Complex Geometrical Variations within the Spray Footprint on Thermal Barrier Coating Properties: Mr. Mitchell L. Sesso1, Prof. Christopher C. Berndt1, Dr. John Thornton1 and Ms. Sun Yung Kim1, 1Industrial Research Institute Swinburne (IRIS), Swinburne University of Technology, Hawthorn, VIC, Australia, 2Air Vehicles Division, DSTO, Melbourne, Australia

4:20 p.m.
Advanced Cold Spray Development for Aerospace Aluminum Alloys: Mr. Victor K. Champagne, U.S. Army Research Laboratory, Aberdeen Proving Ground, MD

4:40 p.m.
Evaluation of Powder Properties on the Performance of Cold Sprayed Ti6Al4V for Aerospace Repairs: Dr. Tiziana Marrocco1, Philip McNutt2, Dr. Roger Barnett2, Dr. Simone Vezzi2, Enrico Vedelago2, Prof. Mario Guagliano3, Dr. Seyyed Mostafa Hassan-Gangaraj4, Dr. Pedro Poza5, Dr. C.J. Munez5, Miguel Angel Garrido-Maneiro5, A. Rico5, Robert Defley6, Antonio Aragon-Ortiz6 and Ms. H L de Villiers Lovelock7, 1TWI ltd, Cambridge, United Kingdom, 2Dipartimento di Ingegneria Meccanica, Politecnico di Milano, Milano, Italy, 3Veneto Nanotech, Venice, Marghera, Italy, 4Mechanical engineering department, Politecnico di Milano, Milano, Italy, 5University Rey Juan Carlos, Mostoles, Spain, 6Veneto Nanotech, Venice, Italy, 7LPW Technology, Runcorn, United Kingdom, 8Ingenieria de SPF, Airbus Military (CBC Plant), El Puerto de Santa Maria (Cadiz), Spain

5:00 p.m.
Cold Spray of Al Alloys as Repair Technology in Aeronautics: Dr. Simone Vezzi1, Enrico Vedelago1, Mr. Peter Richter Sr.2, Mr. Peter Richter Jr.2, Prof. Mario Guagliano3, Mrs. Atieh Moridi4, Dr. Pedro Poza5, Dr. C.J. Munez5, Dr. Giovanni Paolo Zanon6 and Dr. Giovanni Alfeo7, Dr. Seyyed Mostafa Hassan Gangaraj7, 1Veneto Nanotech, Venice, Italy, 2Impact Innovations GmbH, Rattenkirchen, Germany, 3Mechanical engineering department, Politecnico di Milano, Milano, Italy, 4Universidad Rey Juan Carlos, Mostoles, Spain, 5GE Avio s.r.l., Rivalta di Torino, Italy, 6GE Avio s.r.l., Brindisi, Italy, 7Mechanical Engineering Department, Politecnico di Milano, Milano, Italy

5:20 p.m.
The Measurement of Residual Stresses in Cold Sprayed Nickel Based Superalloys via Neutron Diffraction: Ms. Sun Yung Kim1, Dr. Vladimir Luzin2, Dr. John Thornton3, Dr. Peter King4, Dr. Darren Fraser4, Mr. Mitchell L. Sesso1, Mr. Stefan Gulizia5, Dr. Yat Choy Wong5 and Prof. Christopher C. Berndt1, 1Industrial Research Institute Swinburne (IRIS), Swinburne University of Technology, Hawthorn, VIC, Australia, 2The Bragg Institute, Australian Nuclear Science and Technology Organisation, Sydney, Australia, 3Air Vehicles Division, DSTO, Melbourne, Australia, 4Manufacturing Flagship, CSIRO, Melbourne, Australia

7:00 p.m.-10:00 p.m.
Social Event* - Queen Mary
Transportation Provided at Hyatt Regency and Hyatt Pike • *Ticket Required & Sold Separately

Recent Developments in Ferrous Alloys
4:00 p.m.–5:30 p.m.
Meeting Room: 202A

Session Chairs:
Mr. Brian Boyette
NAVAIR
Cherry Point, NC USA

Dr. Michael Hahn
Northrop Grumman Corporation
Torrance, CA USA

Dr. Jeffrey Waldman
Navmar Applied Sciences Corporation
Warmister, PA USA

4:00 p.m.
High-Strength Stainless Steels: A Balance to Achieve Mechanical Properties and Stress Corrosion Resistance: Mr. Martin Surand1, Mr. Franck Devilder2, Mr. Jacques Lecadet3, Mr. Sylvain Puech4, Dr. Nicolas Binet5 and Mrs. Valentine Deneux6, 1Material & Process Department, Messier Bugatty Downey, Bidos, France, 2Technical direction, Aubert&Duval,
PARIS CEDEX 15, France, 'Technical direction, Aubert&Duval, Les Ancizes, France, 'Material & Process department, Messier Bugatty Downty, Bidos, France

4:30 p.m.
Properties of M54 Steel: Dr. Eun U. Lee, Navy, Naval Air Warfare Center Aircraft Division, Patuxent River, MD

5:00 p.m.
Integrated Computational Materials Engineering (ICME) Development of a High-Hardness Solution-Nitrided Stainless Steel: Dr. Jason Sebastian, Jiadong gong, Mr. David Snyder, Nicholas Hatcher and Prof. Gregory Olson, QuesTek Innovations, LLC, Evanston, IL

7:00 p.m.-10:00 p.m.
- Social Event* - Queen Mary
Transportation Provided at Hyatt Regency and Hyatt Pike •
*Ticket Required and Sold Separately

Wednesday, May 13, 2015

Additive Manufacturing IV
8:00 a.m.–12:00 p.m.
Meeting Room: 201A

Session Chair:
Dr. Daniel G. Sanders
The Boeing Company
Seattle, WA USA

8:00 a.m.
Laser Metal Deposition of an Al-0.9wt%Sc Alloy: Dr. Paul Rometsch1,2, Dr. Tom Jarvis1,2 and Prof. Xinhua Wu1,2, 1Monash Centre for Additive Manufacturing, Monash University, Melbourne, Australia, 2Department of Materials Engineering, Monash University, Clayton, Australia

8:30 a.m.
The Influence of Processing Parameters on Selective Laser Melting of A357 Al Cast Alloy: Mr. Heng Rao1,2, Dr. Stephanie Giet1,2, Prof. Chris Davies1,2 and Prof. Xinhua Wu1,2, 1Monash Centre for Additive Manufacturing, Monash University, Clayton, Australia, 2Monash Centre for Additive Manufacturing, Notting Hill, Australia, 3Materials Engineering, Monash University, Clayton, Australia

9:00 a.m.
Selective Reinforcement Using Metal Matrix Composite Prepreg and Ultrasonic Additive Manufacturing: Mr. Brian Gordon1 and Mr. Mark Norfolk2, 1Touchstone Research Laboratory, Triadelphia, WV, 2Fabrisonic, Columbus, OH

9:30 a.m.
Industrial Applications of Laser Additive Manufacturing: Dr. Richard Freeman1, Dr. Robert Scudamore2, Dr. Carl Hauser3 and Dr. Sozon Tsopanos4, 1TWI Ltd, Cambridge, United Kingdom, 2TWI Technology Centre (Yorkshire), Rotherham, United Kingdom

10:00 a.m.-10:30 a.m.
- Refreshment Break - Exhibit Halls A&B •

10:30 a.m.
Quality Assurance for Electron Beam 3D Printing: Dr. Richard Freeman1, Mr. Mike Nunn2, Dr. Colin Ribton2 and Dr. Robert Scudamore1, 1TWI Ltd, Cambridge, United Kingdom, 2Electron Beam, TWI Limited, Cambridge, United Kingdom, 3TWI Technology Centre (Yorkshire), Rotherham, United Kingdom

11:00 a.m.
Additively Manufactured Vents for NASA’s Orion Exploration Flight Test 1: Mr. Andrew Clifton1, Mr. Roger Taylor III2, Mr. Brian Tichenor3 and Mr. Alex Fima4, 1Lockheed Martin Space Systems Company, New Orleans, LA, 2Lockheed Martin Space Systems Company, Kennedy Space Center, FL, 3Lockheed Martin Information Systems & Global Solutions, Houston, TX, 4RTI Directed Manufacturing, Austin, TX

11:30 a.m.
On Influence of Processing Parameters on Surface Roughness and Microstructure of Hastelloy X Produced by Selective Laser Melting (SLM): Mr. Yang Tian1, Prof. Xinhua Wu2, Dr. Dacian Tomus1, Dr. Emilie Herny3, Dr. Jean-Francois Rideau4 and Dr. Stephane Vaillant5, 1Monash Centre for Additive Manufacturing, Monash University, Victoria, Australia, 2Monash University, Notting Hill, Australia, 3Microturbo, Toulouse, France

Lunch On Own •

Bond Coat Development for TBCs
8:00 a.m.–9:40 a.m.
Meeting Room: 102B

Session Chairs:
Prof. Robert Vaßen
Forschungszentrum Jülich GmbH
Jülich, Germany

Mr. Raymond Sinatra
Rolls Royce Corporation
Indianapolis, IN USA

8:00 a.m.
Plasma Sprayed High Entropy Alloys: Microstructure and Properties of AlCoCrFeNi and MnCoCrFeNi: Dr. Andrew S.M. Ang1, Prof. Christopher C. Berndt2, Mr. Mitchell L. Sesso3, Ms. Ameey Anupam3, Mr.
Praveen Sathiyanamoorthi, Dr. Ravi Sankar Kottada and Prof. B.S. Murty, 1Industrial Research Institute Swinburne (IRIS), Swinburne University of Technology, Hawthorn, VIC, Australia, 2Industrial Research Institute of Swinburne (IRIS), Swinburne University of Technology, Melbourne, Australia, 3Department of Metallurgical and Materials Engineering, Indian Institute of Technology Madras, Chennai, India

8:20 a.m.
Investigation of Cold Sprayed MCrAlY as a Bondcoat Candidate for Thermal Barrier Coating: Dr. Xinqing Ma and Mr. Peter Ruggiero, 1Curtis Wright Corporation, East Windsor, CT, 2Curtiss Wright Corporation, East Windsor, CT

8:40 a.m.
Low Pressure Coating System (LPCS) for Plasma Spraying of Aerospace Gas Turbine Engine Applications: Dr. Robert Gansert, Mr. Ralph Herber, Mr. Adrian Vogel and Mr. Ludwig Guggenheim, 1Advanced Materials & Technology Services, Inc., Simi Valley, CA, 2AMT AG, Dottingen, Switzerland

9:00 a.m.
Influence of Pre-treatment on the Growth Behavior of TGO on MCrAlY Bond Coat Surface: Mr. Bang-Yan Zhang, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

9:20 a.m.
Cold Sprayed CoNiCrAlY Bond Coats for Thermal Barrier Coatings Applications: Dr. Cristian V. Cojoacaru and Dr. Eric Irissou, National Research Council of Canada, Boucherville, QC, Canada

8:20 a.m.
Hierarchical Nanocomposite Coatings for Component Life Extension: Mr. Andrew J. Sherman, Dr. Evelina Vogli and Mr. Gabriel Santillan, Mesocoat Inc., Euclid, OH

8:40 a.m.
Manufacturing of Thick, Crack-Free Wear Protective Coatings on Complex Geometries for Gas Turbine Parts: Dr. Thomas Duda and Mr. Marcus Riedel, Alstom (Switzerland), Birr, Switzerland

9:00 a.m.
The Effect of Heat Treatment on Mechanical Properties of Thermally Sprayed Sandwich Structure Beams: Mr. Saeid Salavati, Prof. Thomas W. Coyle and Prof. Javad Mostaghimi, Centre for Advanced Coating Technologies (CACT), University of Toronto, Toronto, ON, Canada

9:20 a.m.
Investigation of the Deposition Mechanism of Cold Spray onto Carbon Fibre Reinforced Polymers: Mr. Hanqing Che, Prof. Stephen Yue and Dr. Phuong Vo, 1Materials Engineering, McGill University, Montreal, QC, Canada, 2Mining and Materials Engineering, McGill University, Montreal, QC, Canada, 3National Research Council Canada, Boucherville, QC, Canada

9:40 a.m.
The Phase Structure of High Purity Rare Earth Oxide Coatings Used for Anti-Plasma Erosion: Ms. Xiaojuan Ji, Mr. Yueguang Yu, Wei’ao Hou and Xianjing Ren, Beijing General Research Institute of Mingning & Metellurgy (BGRIMM), Beijing, China

10:00 a.m.–10:30 a.m.
• Refreshment Break • Exhibit Halls A&B •

High Temperature and Turbine Materials III
8:00 a.m.–11:30 a.m.
Meeting Room: 202B

Session Chair:
Mr. Eli Ross
UTC Pratt & Whitney
East Hartford, CT USA

8:00 a.m.
Additive Manufacturing using Kinetic Metallization™: Dr. Ralph Tapphorn, Mr. Howard Gabel and Mr. Kyle Burriesci, Inovati, Santa Barbara, CA

8:30 a.m.
Cyclic Oxidation and Degradation of High-Temperature Alloys: Dr. Kuiying Chen and Dr. Prakash
9:00 a.m.
**Oxidation Kinetic of Nickel Base Superalloy for Seamless Wrought Rings in Aviation Industry:**
Mr. Jorge Taboada, Dr. Facundo Almeraya, Prof. Patricia Zambrano, Dr. Citllalli Gaona, and Mr. Manuel Lira, Universidad Autonoma de Nuevo Leon, Apodaca, Mexico, Aeronautical Materials, Universidad Autonoma de Nuevo Leon, Apocada, Nuevo Leon, Mexico, AERONAUTICAL ENGINEERING, UNIVERSIDAD AUTONOMA DE NUEVO LEON, SAN NICOLAS NL, Mexico, Metallurgy, CIMAV, Chihuahua, Mexico, Universidad Autonoma de Nuevo Leon, San Nicolas de los Garza, Mexico

10:00 a.m.–10:30 a.m.
- Refreshment Break - Exhibit Halls A&B -

10:30 a.m.
**Rapid, Cost-Effective, Melt Infiltration Processing of Ultrahigh Temperature Ceramic and Metal Matrix Composites:** Dr. Jacob J. Stiglich, Mr. Jerry Brockmeyer, Mr. Timothy Stewart and Mr. Brian Williams, Ultramet, Pacoima, CA

11:00 a.m.
**Predicting the Self-Healing Potential of MAX Phase Metallo-Ceramics under Turbine Engine Relevant Conditions:** Ms. Ann-Sophie Farle, TU Delft, Delft, Netherlands

8:00 a.m.
**Nitriding Hardness Validation:** Mr. William Wentland, Materials Science & Engineering, United Technologies Aerospace Sytems, Rockford, IL

9:00 a.m.
**Metallic Glass Coating for Enhancing Fatigue Property:** Mr. C. H. Chang, Dr. C. M. Lee, Mr. Chia-Chi Yu, Dr. Wahyu Diyatmika, Prof. Peter K. Liaw and Prof. Jinn P. Chu, Dept. of Materials Sci. and Eng., National Taiwan University of Science and Technology, Taipei, Taiwan, Department of Materials Science and Engineering, The University of Tennessee, Knoxville, TN

9:30 a.m.
**Fretting Wear, Rotary Bending and Ultrasonic Fatigue Properties of Aged Inconel 718 Alloy Subjected to Ultrasonic Nanocrystal Surface Modification Technique:** Dr. Auezhan Amanov, Mr. Jun-Hyong Kim, Dr. In-sik Cho and Prof. Young-Sik Pyun, Mechanical Engineering, Sun Moon University, Asan, South Korea, Mbrosia, Asan-si, South Korea

10:30 a.m.
**Improvement in Rotary Bending Fatigue and Ultrasonic Fatigue Behavior of Ti-6Al-4V STA alloy by Ultrasonic Nanocrystal Surface Modification Technique:** Prof. Young-Sik Pyun, Dr. Auezhan Amanov, Mr. Jun-Hyong Kim and Dr. In-sik Cho, Mechanical Engineering, Sun Moon University, Asan, South Korea, Mbrosia, Asan-si, South Korea

8:00 a.m.
**On the Application of Cold Spray Coating in Repairing Damaged Parts: Study of Cavity Filling and Fatigue Behavior:** Dr. Simone Vezzu, Mrs. Atieh Moridi, Prof. Mario Guagliano and Dr. Seyyed Mostafa Hassan Gangaraj, Veneto Nanotech, Venezia, Marghera, Italy, Mechanical Engineering Department, Politecnico di Milano, Milano, Italy, Mechanical engineering department, Politecnico di Milano, Milano, Italy

11:00 a.m.
**Ultrasonic Nanocrystalline Surface Modification (UNSM) Technique towards Improving Mechanical and Tribological Properties of Metallic Materials and Ceramics:** Mr. Jun-Hyong Kim, Dr. Auezhan Amanov and Prof. Young-Sik Pyun, Mechanical Engineering, Sun Moon University, Asan, South Korea

· Lunch On Own ·
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**Sustainability of Aerospace Materials & Processes**
8:00 a.m.-10:00 a.m.
Meeting Room: Room 201B

**Session Chairs:**
Mr. Fernando Fernandez
Embraer
São José dos Campos, Brazil

Dr. James D. Cotton
Boeing Research and Technology
Seattle, WA USA

8:00 a.m.
A Preliminary Study on Glass Fiber Reinforced Thermoplastic Composite Fabrication for Small Wind Turbine Blade: Dr. Dave Kim, Mr. Juan Garate, Dr. Steve Solovitz and Mr. Sina Alizadeh Ashrafi, Washington State University Vancouver, Vancouver, WA

8:30 a.m.
Ultra-Low NOx Technology with Temperature Uniformity Benefits for Forge and Heat Treat Applications: Mr. Justin Dzik1 and Mr. William Tracey2, 1Research and Development, Fives North American Combustion, Cleveland, OH, 2Specialty Sales Group, Fives North American Combustion, Cleveland, OH

9:00 a.m.
CO2 Technology Transforms Manufacturing: Mr. David Jackson, CleanLogix LLC, Santa Clarita, CA

9:30 a.m.
A New Design for Aircraft Weight Distribution Control: Dr. Mohsine Bouya1, Dr. Badr Abou El majd2 and Prof. Abdellatif Ben Abdellah3, 1R&D, Université Internationale de Rabat, Sala al Jaddida, Morocco, 2Math & CS, Université Hassan II, Casablanca, Morocco, 3Université Abdelmalek Essaied, Tanger, Morocco

10:00 a.m.-10:30 a.m.
- Refreshment Break • Exhibit Halls A&B •

Advanced Aluminum Alloys: Light High Performance Alloys and Structures III
8:30 a.m.-11:30 a.m.
Meeting Room: 203A

**Session Chair:**
Dr. Julien Boselli
Alcoa Technical Center
Alcoa Center, PA USA

8:30 a.m.
Properties of High Energy Milled Structural Aluminum MMC: Mr. Don Hashiguchi, FASM1, Dr. David Tricker2 and Mr. Andrew Tarrant2, 1Materion Aerospace Metal Composites Ltd, Farnborough, Hampshire, England, 2Materion Aerospace Metal Composites Ltd, Elmore, OH

9:00 a.m.
Progression of Corrosion Damage in a 3rd Generation Aluminum Lithium Alloy 2060: Mr. Michael Velez1, Dr. Nick Wilson1, Mr. Homero Castaneda2 and Dr. Kumar Jata3, 1UES Inc.AFRL/RXCM, Wright-Patterson AFB, OH, 2UDRI, AFRL/RXS5, Wright-Patterson AFB, OH, 3University of Akron, Akron, OH

10:00 a.m.-10:30 a.m.
- Refreshment Break • Exhibit Halls A&B •

10:30 a.m.
A20X, Already in Serial Casting Production, also Shows Remarkable Properties in Powder Metallurgy, Extrusion, Sheet and Superplastic Forming: Mr. Mike Bond, Aeromet International PLC, Worcester, United Kingdom

11:00 a.m.
Advanced Aluminum Materials for Elevated Temperature Applications: Mr. Edmund Dunn1, Dr. Timothy Warner2, Dr. C. Sigli1, Ms. Gaëlle Pouget3 and D. Ebersolt4, 1Constellium Aerospace and Transportation, Kirkland, WA, 2CRV, Constellium LLC, Voreppe, France, 3Constellium Research Center, Voreppe, France

- Lunch On Own -

Additive Manufacturing V
1:00 p.m.—4:30 p.m.
Meeting Room: 201A

**Session Chair:**
Mr. Zach Loftus
Lockheed Martin Space Systems
Littleton, CO USA

1:00 p.m.
A Novel Additive Manufacturing Process Based on Wire and Plasma: Dr. Hilde Løken Larsen, Mathisen, M. Mathisen, P. Almeida, Mr. Pedrum Sodouri and Francisco Vega, Norsk Titanium AS, Honefoss, Norway
1:30 p.m.
Early Insertion of Additive Manufacturing on Spacecraft Components: Mr. Suraj Rawal and Elliot Goldman, Lockheed Martin Space Systems, Denver, CO

2:00 p.m.
Process Refinement to Improve NDI in Additively Manufactured Components: Mr. Hank Phelps, Lockheed-Martin, Marietta, GA

2:30 p.m.
Deployment of Additive Manufacturing at Lockheed Martin Space Systems Company: Mr. Zach Lofthus, N/A Slade Gardner, Mr. Suraj Rawal and N/A Ken Marts, Lockheed Martin Space Systems, Littleton, CO

3:00 p.m.–3:30 p.m.
• Refreshment Break • Exhibit Halls A&B •

3:30 p.m.
Material Measurements Research for Additive Manufacturing: Dr. Richard Ricker, Material Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD

4:00 p.m.
The Development of Electron Beam Melting for High-Volume Production: Dr. Francisco Medina, Arcam, Naperville, IL

Engineering TBCs and Abradables
1:00 p.m.–4:50 p.m.
Meeting Room: 102B

Session Chairs:
Mr. Yuk-Chiu Lau
General Electric Global Research
Niskayuna, NY USA

Jeff Smith
Material Processing Technology
Norton Shores, MI USA

1:00 p.m.
Investigation on Plasma Sprayed CoNiCrAlY-BN-Polyester Abradable Coating Consistency using In-flight Particle Diagnostics: Dr. Eric Irissou¹, Prof. Christian Moreau² and Dr. Rogério S. Lima³, ¹National Research Council Canada, Boucherville, QC, Canada, ²Mechanical and Industrial Engineering, Concordia University, Montreal, QC, Canada, ³National Research Council of Canada (NRC), Boucherville, QC, Canada

1:20 p.m.
Microstructure and Properties of porous Abradable Alumina Coatings flame-sprayed by Semi-molten Particles: Prof. Chang-Jiu Li, Ms. Jiao Zou, Mr. Hui-Bin Huo, Prof. Cheng-Xin Li, Prof. Guan-Jun Yang and Ms. Jian-Tao Yao, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

1:40 p.m.
Influence Of APS Process Parameters On Morphologies Of YSZ-Polyester Abradable Coatings: Mrs. Delphine Aussavy³, Dr. Rodolphe BOLOT‡, Prof. Ghislain Montavon⁴, Prof. François Peyraut⁵, Dr. Gregory Szendelman⁴, Dr. Julien Gurt-Santanach⁴ and Dr. Serge Selezneff⁶, ³IRTES-LERMP, University of Technology of Belfort-Montbéliard, Belfort, France, ⁴M3M-LERMPS, UTBM, Belfort, France, ⁵Oerlikon Metco, Wohlen, Switzerland, ⁶TURBOMECA, Bordes, France, ²SNECMA, Moissy-Cramayel, France

2:00 p.m.
Application of FEM for the Estimation of Thermo-Mechanical Properties of Plasma Sprayed Composite Coatings: Dr. Rodolphe BOLOT‡, Ms. Delphine Aussavy³ and Prof. Ghislain montavon⁴, ³IRTES-LERMP, University of Technology of Belfort-Montbéliard, Belfort, France, ²University of Technology of Belfort-Montbéliard, Belfort, France

2:20 p.m.
AFM Study of the Faceting of Ceramic Splats during Thermal Exposure for designing high sintering-resistance TBCs: Dr. Tao Liu, Dr. Xiao-Tao Luo, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

2:40 p.m.
High Efficiency Deposition of the Porous Ceramic Abradable Coating using a High Energy Plasma Torch: Jianming Liu, Jianming Liu, Mr. Yueguang Yu, Beijing General Research Institute of Mingning & Metallurgy (BGRIMM), Beijing, China

3:00 p.m.–3:30 p.m.
• Refreshment Break • Exhibit Halls A&B •

3:30 p.m.
Formation of a continuous β-NiAl layer near the interface in a γ+β MCrAlY: Dr. Kang Yuan¹, Prof. Ru Lin Peng¹ and Dr. Xin-Hai Li², ¹Linkoping University, Linkoping, Sweden, ²Material Technology, Research & Development, Siemens Industrial Turbomachinery AB, Finspong, Sweden

3:50 p.m.
High Temperature Oxidation of Cold Gas Sprayed Bond Coats for Tbc Application: Prof. Carlos R. C. Lima¹, Mr. V. Crespo², Dr. I. G. Cano³, Dr. Sergi Dosta³, Ms. M.J.X. Belem¹ and Prof. Josep M. Guilemany³, ¹College of Engineering, UNIMEP—Methodist University of Piracicaba, Santa Bárbara d’Oeste,
A Comparison of the Thermal Properties of ZrO2-Ln2O3 (Ln – Y, La, Nd, Sm, Gd) Thermal Barrier Coatings: Mr. Ivan Mazilin1, Dr. Lev Baldaev2 and Prof. Dmitri Drobot3, 1TSPC Ltd., Moscow, Russia, 2TSPC Ltd., Moscow, Russia, 3Lomonosov Moscow University of Fine Chemical Technology, Moscow, Russia

Hybrid HVOF and High Power Plasma Spray Gun Coating Advancements for Aero and Land Based Gas Turbine Engine Applications: Mr. Ludwig Guggenheim1, Mr. Ralph Herber1, Mr. Adrian Vogel1 and Dr. Robert Gansert2, 1AMT AG, Dottingen, Switzerland, 2Advanced Materials & Technology Services, Inc., Simi Valley, CA

Development Of A Two-Stage Hybrid Technology For Repairing Turbine Blades: Dr. Martin Nicolaus, Dr. Kai Möhwald and Prof. Hans J. Maier, Institute of Materials Science, Leibniz University of Hannover, Garbsen, Germany

Thermal Exposure Testing of a Multilayer Oxidation Protection System for Gamma-TiAl: Prof. Kirsten Bobzin, Mr. Mehmet Öte and Mr. Thomas Frederik Linke, Surface Engineering Institute, RWTH Aachen University, Aachen, Germany

HVOF and HVAF Coatings of nano-agglomerated Tungsten Carbide—Cobalt powders for Water Droplet Erosion Application: Dr. Fariba Tarasi1, Mr. Mohammad- Sadegh mahdipoor1, Prof. Ali Dolatabadi2, Prof. Mamoun medraj2 and Prof. Christian Moreau2, 1MIE, Concordia University, Montréal, QC, Canada, 2Mechanical and Industrial Engineering, Concordia University, Montreal, QC, Canada

Wear Characteristics of Mixed Lubricious Oxide Coatings: Dr. Satish Dixit1, Dr. Osman Levent Eryilmaz2 and Dr. Ali Erdemir3, 1Plasma Technology Inc., Torrance, CA, 2Argonne National Lab, Chicago, CA

In-Situ Observation Of Laves Phase Precipitation And Oxidation Of HVOF Deposited Tribaloy™ T-800 (CoMoCrSi alloy) Coatings: Mr. Andrew Vackel1, Mr. David Lee2 and Prof. Sanjay Sampath1, 1Materials Science and Engineering, Stony Brook University, Center for Thermal Spray Research, Stony Brook, NY, 2Kennametal Stellite, Goshen, IN, 3Center for Thermal Spray Research, Stony Brook University, Stony Brook, NY

Kinetic Metallization™ of Tungsten Carbide Wear Resistant Coatings: Dr. Ralph Tapphorn, Mr. Howard Gabel and Mr. Travis Crowe, Inovati, Santa Barbara, CA

Low Hydrogen Embrittlement (LHE) Alkaline Zinc Nickel (Zn-Ni) Plating: Mr. Craig Pessetto, R&D, ES3, Clearfield, UT

Dimensional Restoration of High-Valued Military Components Using Kinetic Metallization™: Dr. Ralph Tapphorn, Mr. Howard Gabel and Mr. Travis Crowe, Inovati, Santa Barbara, CA

Eliminating Hexavalent Cr Emissions in Thermal Spray Alloys: Dr. Justin Cheney, SCOPERTA, INC., San Diego, CA

Failure Analysis of Aerospace Components 1:00 p.m.–3:00 p.m. Meeting Room: 202A

Session Chair: Mr. Brian Boyette  NAVAIR
Cherry Point, NC USA

1:00 p.m. INVITED: Failure Analysis in the Aerospace Industry—What’s Next?: Dr. Daniel Dennies, Materials & Corrosion, Exponent—Failure Analysis Associates, Irvine, CA
1:30 p.m.
Virtual Failure Analysis of an Aerospace Aluminum Alloy Component: Dr. JT Staley, Corporate Technology, Element Materials Technology, New Berlin, WI

2:00 p.m.
Caustic Embrittlement Cracking on a Helicopter Tail Rotor Output Shaft: Mr. Robert Figueroa, Bell Helicopter Textron Inc., Fort Worth, TX

2:30 p.m.
Mechanical Electrochemical Study of Susceptibility to Stress Corrosion Cracking of Aeronautical Alloys Al6061-T6 and Inconel 600: Ms. Catalina Jaramillo Isaza, Dr. Facundo Almeraya and Dr. Citlalli Gaona Tiburcio, Aeronautical Materials, Universidad Autonoma de Nuevo Leon, Apocada, Nuevo Leon, Mexico

3:00 p.m.–3:30 p.m.
- Refreshment Break - Exhibit Halls A&B -

Titanium Alloy Technology II
1:00 p.m.–4:30 p.m.
Meeting Room: 201B

Session Chairs:
Dr. Don Li
RTI International Metals, Inc.
Niles, OH USA

Mr. Eric Bono
Summit Materials, LLC
McDonald, PA USA

1:00 p.m.
Development of New High Strength Alloy: Titanium 5Al-5V-5Mo-3Cr: Mr. Robert Briggs, The Boeing Company, Seattle, WA

1:30 p.m.
On the Influence of Microstructure on the Mechanical Behaviour of Ti-5Al-5Mo-5V-3Cr: Dr. Nicholas G. Jones¹, Dr. David Dye¹ and Prof. Trevor Lindley¹, ‘The University of Cambridge, Cambridge, United Kingdom, ‘Imperial College London, London, United Kingdom

2:00 p.m.
The Effect of Heat Treatment on the Structure and Fracture Behavior of VST5553 Titanium Alloy: Prof. Sergey Demakov, Prof. Dmitry Gadeev and Prof. Anatoly Illarionov, Heat Treatment and Physics of Metals, Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg, Russia

2:30 p.m.
Assessment of the High-Temperature Oxidation Performance of Ti-Based Systems via a Novel Combinatorial Approach: Mr. Peyman Samimi, Mr. David Brice, Mr. Yue Liu and Prof. Peter C Collins, Dept. of Materials Science & Engineering, University of North Texas, Denton, TX

3:00 p.m.–3:30 p.m.
- Refreshment Break - Exhibit Halls A&B -

3:30 p.m.
Influence of Non-Equilibrium Structure on the Mechanical Properties of Heat-Resistant Titanium Alloy: Mrs. Maria Popova and Prof. Artemy Popov, Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg, Russia

4:00 p.m.
The Design of Hot-Isostatic Pressing Schemes for Ti-5Al-5Mo-5V-3Cr and their Effects on Microstructure and Fatigue Properties: Dr. Nataliya Perevoschikova¹, Dr. Christopher Hutchinson¹ and Prof. Xinhua Wu¹, ¹Department of Materials Engineering, Monash Clayton University, Victoria, Australia, ¹Monash University, Notting Hill, Australia

Thursday, May 14, 2015

Tribological, Oxidation, Corrosion Behavior of Aerospace-based Coatings
8:00 a.m.–11:30 a.m.
Meeting Room: 102A

Session Chair:
Prof. Petri Vuoristo
Tampere University of Technology
Tampere, Finland

8:00 a.m.
Cold Spray and Reaction Sintering of Ti-TiAl3 Composite Coatings: Dr. Volf Leshchynsky¹, Dr. Oleksandra Bielousova² and Prof. Anatoli Papyrin³, ¹Institute for Diagnostic Imaging Research, University of Windsor, Windsor, ON, Canada, ²DIPI Laboratory, Ecole Nationale d’Ingenieurs de Saint-Etienne (ENISE), Saint-Etienne, France, ³Cold Spray Technology, Albuquerque, NM

8:20 a.m.
The Micro Structure and Tribological Properties of Liquid-Fuel HVOF Sprayed Fine WC-Co-CR Coating: Mr. Rohit Upadhyaya¹, Dr. Sharad Shrivastava¹, Mr. S.C Modi² and Mr. A Modi², ¹Birla Institute of Technology and Science ,Pilani INDIA, Pilani, India, ²R&D, Metallizing Equipment Company, Jodhpur, India
8:40 a.m.
High Temp. Coatings Based on Aluminum Phosphate: Dr. Lingyan Kong, Division of Surface Engineering, Institute of metal research, CAS, Shenyang, China

9:00 a.m.
Preparation and Oxidation Behavior Of Thermal Barrier Coatings with a TiAl3 Bond Coat on γ-TiAl Alloy: Prof. Tianying Xiong, DIVISION OF SURFACE ENGINEERING, Institute of metal research, CAS, SHENYANG, China

9:20 a.m.
Effect Of Particle Morphology On The Tribological Behavior Of Cold Sprayed Al MMC Coatings: Mr. J. Michael Shockley1, Prof. Richard R. Chromik1, Dr. Sylvie V. Descartes2 and Dr. Phuong Vo3, 1Mining and Materials Engineering, McGill University, Montreal, QC, Canada, 2Laboratoire de Mécanique des Contacts et des Structures, INSA de Lyon, Lyon, France, 3National Research Council Canada, Boucherville, Montreal, QC, Canada

9:40 a.m.
Preparation and Oxidation Behavior of a TiAl3 Coat on TiAl Alloy by Cold Spray: Prof. Tianying Xiong, DIVISION OF SURFACE ENGINEERING, Institute of metal research, CAS, Shenyang, China

10:00 a.m.–10:30 a.m.
 Refreshment Break • Meeting Space Foyer •

10:30 a.m.
LaMgAl11O19 Coating for Thermal Barrier Applications Produced by EB-PVD: Dr. Armen Kuzanyan1, Silva Petrosyan2, Georgi Badalyan1, Astghik Kuzanyan1 and Prof. Vassilis Stathopoulos1, 1MS, Institute for Physical Research, National Academy of Sciences, Ashtarak, Armenia, 2LLFS, Institute for Physical Research, National Academy of Sciences, Ashtarak, Armenia, 3Department of Electrical Engineering, Technological Educational Institute of Sterea Ellada, Psachna Chalkida, Greece

10:50 a.m.
Preparation of Inorganic Ceramic Coatings on γ-TiAl Alloys: Dr. Lingyan Kong, DIVISION OF SURFACE ENGINEERING, Institute of metal research, CAS, Shenyang, China

11:10 a.m.
Effects of the Heat Treatments on the Corrosion Rate of Ni-base Alloy Coatings Applied by Thermal Spray: Dr. José Cabral1, Mrs. Jamnie Achem1, Dr. Facundo Almeraya2, Dr. Patricia Zambrano3, Dr. Carlos Poblano4 and Dr. Citllalli Gaona5, 1Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Mexico, 2Aeronautical Materials, Universidad Autonoma de Nuevo Leon, Apocada, Nuevo León, Mexico, 3Facultad de Ingeniería Mecánica y Eléctrica, Universidad Autónoma de Nuevo León, San Nicolas de los Garza, Mexico, 4Centro de Tecnologia Avanzada, El Marques, Mexico

DAVID J. CHELLMAN SCHOLARSHIP

ASM Materials Education Foundation is pleased to announce a recently established scholarship by Mrs. Arline Denny in loving memory of her husband David J. Chellman.

As a long-standing Senior Technical Fellow with Lockheed Martin Corporation, a life member of ASM International and enthusiastic member of the AeroMat Conference Organizing Committee for 25 years, David J. Chellman will be missed by all of those who were touched by his work in the industry.

The new scholarship is an expression of his commitment to education and material science and the engineering community at large. It will be awarded to one individual in the amount of $2,500 and the winner will be judged on academic merit and financial need.

To honor his memory, donations are now being accepted towards the David J. Chellman scholarship. For more information please contact Nichol Campana at Nichol.campana@asminternational.org or 800-336-5152 X 5506.
EDUCATION COURSES

Improve your materials knowledge by taking an ASM Education short course at AeroMat. Taught by industry experts, these interactive learning experiences will help you stay up-to-date and competitive while getting the most from the AeroMat Conference and Exposition.

Registration and Courses will be held at the Hyatt Regency Long Beach • Thursday, May 14, 2015

Education Short Course registration will be from 8:00 a.m.–10:00 a.m. in the Seaview Foyer

Education Short Course Pricing
Member: $525.00 • Non-Member: $725.00 • Student: $275.00

ADDITIVE MANUFACTURING SYSTEMS
Instructor: Francisco Medina, PhD, ARCAM/ORNL MDF

Course Description
The course, Additive Manufacturing Systems, deals with various aspects of additive, subtractive, and joining processes to form three-dimensional parts with applications ranging from prototyping to production. Additive manufacturing (AM) technologies fabricate three-dimensional (3D) parts using layer-based manufacturing processes directly from computer-aided-design (CAD) models. Direct digital manufacturing (DDM) or rapid manufacturing (RM) is the use of AM technologies in direct manufacturing of end-use parts. In this course, you will learn about a variety of AM and other manufacturing technologies, their advantages and disadvantages for producing both prototypes and functional production quality parts, and some of the important research challenges associated with using these technologies.

Upon completion of this course, each student should be able to:

- Provide a comprehensive overview of AM technologies including descriptions of related technologies including design and AM-specific software and post-processing/part finishing approaches.
- Discuss the wide variety of new and emerging applications like micro-scale AM, medical applications, direct printing of electronics and Direct Digital Manufacturing of end-use components.
- Explain the capabilities, limitations, and basic principles of alternative AM technologies.
- Evaluate and select appropriate AM technologies for specific applications.
- Apply AM techniques to a challenging rapid manufacturing application.
- Identify, explain, and prioritize some of the important research challenges in AM.

FRICITION STIR WELDING & PROCESSING
Instructors: Tony Reynolds and Yuri Hovanski

Course Description
Friction stir welding (FSW) was invented by TWI, Cambridge, UK and patented in 1991. In the last twenty years, the research community has made significant advances in understanding of the process, and numerous industrial applications have been taken to full implementation. During the same period, friction stir processing (FSP) has been developed in parallel with FSW, and essentially employs FSW tooling to perform local thermomechanical treatments rather than to make joints.

The scientific and technical literature is rich with information on joining of aluminum, steel, titanium, magnesium, metal matrix composites, and even superalloys as well as generic information on process fundamentals. The goal of this course is to provide participants with the essence of the accumulated FSW/FSP knowledge: both fundamental and practical. This course is designed to provide a basic understanding of the process and the linkage to performance by introducing aspects from basic process design, controls, tools, and metallurgical aspects. Although the course is general in nature, aerospace applications will be emphasized.
27th AeroMat Conference and Exposition

AEROMAT 2016
MAY 23–26 | MEYDENBAUER CENTER BELLEVUE, WASHINGTON, USA

INNOVATION TAKES FLIGHT
IN AEROSPACE MATERIALS & PROCESSES

CALL FOR PAPERS | DEADLINE: 11.9.15

Organized By: ASM International
Industry Partner: ATI
Corporate Sponsor: Boeing
On behalf of the ASM Thermal Spray Society (TSS), the German Welding Society (DVS), and the International Institute of Welding (iiw), we welcome you to the International Thermal Spray Conference and Exposition 2015. ITSC is where the global thermal spray community meets and conducts business. This year, ITSC 2015 is co-located with AeroMat and IMS/Microstructural Characterization of Aerospace Materials and Coatings offering 3x the technical programming, 3x exhibiting companies and 3x the connections, all for the price of one show!

During our 4 days together, you will learn the latest from industry leaders who will provide opportunities to explore and broaden your specific interests and help achieve professional goals. For students and new professionals involved in thermal spray, this conference will provide invaluable networking opportunities that will serve you for years to come. For our exhibitors, your support of advancements in equipment, materials and services plays a critical role in ITSC’s success.

We have many new and exciting features planned for this year’s conference, including a special presentation by Dr. John Grotzinger, Chief Scientist and Head of Strategic Planning for the Mars Rover Mission, an evening with fellow conference attendees aboard the historic Queen Mary, and much more!

Sincerely,

General Chairs:  
C. Moreau, FASM, Concordia University  
W. Krommer, The Linde Group

Technical Chairs:  
D. Puerta, Curtiss-Wright  
K. Bobzin, RWTH Aachen University

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2015 ITSC ORGANIZING COMMITTEE/PROCEEDINGS EDITORS

Special thanks to the ITSC 2015 technical program volunteers for another outstanding conference. Your hard work and dedication is greatly appreciated.

GENERAL CHAIRS
Christian Moreau, FASM
Concordia University (CA)

Werner Krömmer
The Linde Group (DE)

TECHNICAL CHAIRS
Doug Puerta
Element Materials Technology (US)

K. Bobzin
RWTH Aachen University (DE)

SYMPOSIUM ORGANIZERS
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GE Global Research

Rogerio Lima
National Research Council of Canada

Mitchell Dorfman
Oerlikon Metco Ltd.

Thank You to the ITSC 2015 Proceedings Editors

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Florida International University

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University of Modena and Reggio Emilia

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Thermal Spray Centre (CPT)
Universitat de Barcelona

Yuk-Chiu Lau
GE Power and Water

André McDonald
University of Alberta

Filofteia-Laura Toma
Fraunhofer Institute Material and Beam Technology (IWS)

Erja Turunen
VTT Technical Research Centre of Finland

Christian A. Widener
South Dakota School of Mines and Technology
CONGRATULATIONS TO THE 2015 TSS HALL OF FAME INDUCTEES

Christian Coddet
IRTES-LERMPS
University of Technology of Belfort-Montbéliard
For developing innovative thermal spray techniques and applications and for developing international collaboration programs dedicated to thermal spray research in developing countries.

Lech Pawlowski
University of Limoges
For sustained and innovative thermal spray research and development and significant contributions to the fundamental and technical advancement of thermal spraying.

Sanjay Sampath, FASM
Center for Thermal Spray Research
State University of New York
For innovative interdisciplinary thermal spray research bridging the gap between fundamental science and industrial practice through better understanding of coating properties and the development of advanced diagnostic tools.
The ASM International Thermal Spray Hall of Fame was established in 1993 by the ASM thermal Spray Society. Induction to the Hall of Fame is a means of recognizing and honoring outstanding leaders who have made significant contributions to the science, practice, education, management and advancement of thermal spray.

2015 Class of Inductees
Christian Coddet, University of Technology of Belfort-Montbeliard
Lech Pawlowski, University of Limoges
Sanjay Sampath, FASM, State University of New York

2014 Class of Inductees
Mitchell R. Dorfman, FASM, Oerlikon Metco (US), Inc.

2013 Class of Inductees
M. Brad Beardsley, Caterpillar, Inc.
Christian Moreau, FASM, National Research Council of Canada

2012 Class of Inductees
Frank J. Hermanek, Praxair Thermal Spray Product
Elliott R. Sampson, Tafa/Praxair Surface Technologies

2011 Class of Inductees
Peter Heinrich, Linde Gas AG
Akira Ohmori, Osaka University
Dettlev H. H. Stöver, Forschungszentrum Jülich GmbH

2010 Class of Inductees
Klaus Dieter Landes, Universität der Bundeswehr Muenchen
Andrew Nicoll

2009 Class of Inductees
Daryl E. Crawford, FASM, Thermal Spray Technologies, Inc.
Akira Nakahira, Tocalo Co., Ltd.
Anatolii N. Papyrin, Cold Spray Technology, LLC

2008 Class of Inductees
Robert M. Gage, Union Carbide Corp.
Albert Kay, FASM, ASB Industries, Inc.

2007 Class of Inductees
Christopher C. Berndt, FASM, James Cook University

2006 Class of Inductees
Atsushi Hasui, Keio University
Mark Smith, FASM, Sandia National Laboratories
Donald Yenni, FASM, Union Carbide Corp.

2005 Class of Inductees
Heinrich Kreye, University of Federal Armed Forces

2004 Class of Inductees
Fred W. Gartner, Jr., F. W. Gartner Thermal Spray Company
Anthony J. Rotolico, Englehard Surface Technology
Joachim V. Heberlein, University of Minnesota

2003 Class of Inductees
Maher I. Boulos, University of Sherbrooke
Douglas H. Harris, APS Materials Incorporated

2002 Class of Inductees
Hans-Dieter Steffens, University of Dortmund
Robert C. Tucker, Jr., FASM, The Tucker Group, LLC
René David Wasserman, Eutectic+Castolin

2001 Class of Inductees
Vernon A. Cook, Metallizing Company of America (Mogul)
Ferdinand J. Dittrich, Sulzer Metco (US) Inc.
Hiroshi F. Nakahira, Tocalo Co., LTD

2000 Class of Inductees
No inductees awarded this year.

1999 Class of Inductees
Erich F. Lugscheider, Aachen University

1998 Class of Inductees
Pierre Léon Fauchais, University of Limoges
Moses A. Levinstein, General Electric Aircraft Engine
Herbert† and Marlies Nussbaum, Plasma-Technik

1997 Class of Inductees
Robert E. Mahood, St. Louis Metallizing, Inc.
Erich Muehlberger, Sulzer Metco, Inc.
Jack Ritchie, Bender Machine, Inc.

1996 Class of Inductees
Rea A. Axline, Metco, Inc.
James A. Browning, DRACO, Inc.
Reginald McPherson, Monash University
George H. Smith, Union Carbide Corp.

1995 Class of Inductees
Jack Kittel, H.C. Starck, Inc.
Walter B. Meyer, St. Louis Metallizing, Inc.

1994 Class of Inductees
Herbert Herman, State University of New York
Daniel R. Marantz, Flame-Spray Industries, Inc.
Merle L. Thorpe, Tafa, Inc.
William E. Ballard, Metallisation, Ltd.
Max Ulrich Schoop, Inventor
## PROGRAM AT-A-GLANCE

### NETWORKING OPPORTUNITIES

<table>
<thead>
<tr>
<th>Day</th>
<th>Morning Refreshment Break</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Monday</td>
<td></td>
<td>10:00 a.m. – 10:30 a.m.</td>
<td>Meeting Space Foyer</td>
</tr>
<tr>
<td></td>
<td>Lunch</td>
<td>12:00 p.m. – 1:15 p.m.</td>
<td>Exhibit Halls A&amp;B</td>
</tr>
<tr>
<td></td>
<td>Afternoon Refreshment Break</td>
<td>3:00 p.m. – 3:30 p.m.</td>
<td>Exhibit Halls A&amp;B</td>
</tr>
<tr>
<td></td>
<td>Expo Welcome Reception</td>
<td>5:30 p.m. – 7:00 p.m.</td>
<td>Exhibit Halls A&amp;B</td>
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<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Location</th>
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<tr>
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<td>Exhibit Halls A&amp;B</td>
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<td></td>
<td>12:00 p.m. – 1:00 p.m.</td>
<td>Exhibit Halls A&amp;B</td>
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<td></td>
<td>3:30 p.m. – 4:00 p.m.</td>
<td>Exhibit Halls A&amp;B</td>
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<tr>
<td></td>
<td>7:00 p.m. – 10:00 p.m.</td>
<td>Queen Mary</td>
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**Tuesday**

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<thead>
<tr>
<th>Morning Refreshment Break</th>
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<td>10:00 a.m. – 10:30 a.m.</td>
<td>Exhibit Halls A&amp;B</td>
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<tr>
<td>Lunch</td>
<td>12:00 p.m. – 1:00 p.m.</td>
<td>Exhibit Halls A&amp;B</td>
</tr>
<tr>
<td>Afternoon Refreshment Break</td>
<td>3:00 p.m. – 3:30 p.m.</td>
<td>Exhibit Halls A&amp;B</td>
</tr>
<tr>
<td>Social Event*</td>
<td>7:00 p.m. – 10:00 p.m.</td>
<td>Queen Mary</td>
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**Wednesday**

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<thead>
<tr>
<th>Morning Refreshment Break</th>
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<tbody>
<tr>
<td></td>
<td>10:00 a.m. – 10:30 a.m.</td>
<td>Exhibit Halls A&amp;B</td>
</tr>
<tr>
<td>Allied Facility Tour</td>
<td>10:45 a.m. – 1:15 p.m.</td>
<td>departing from Hyatt Regency. Preregistration required.</td>
</tr>
<tr>
<td>Afternoon Refreshment Break</td>
<td>3:00 p.m. – 3:30 p.m.</td>
<td>Exhibit Halls A&amp;B</td>
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**Thursday**

<table>
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<tr>
<th>Morning Refreshment Break</th>
<th>Time</th>
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<tr>
<td></td>
<td>10:00 a.m. – 10:30 a.m.</td>
<td>Meeting Space Foyer</td>
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*Ticket Sold Separately

### EXPOSITION HOURS/ACTIVITIES

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Monday</td>
<td>12:00 p.m. – 7:00 p.m.</td>
<td>V.I.P. Expo Tour 10:15 a.m. – 11:15 a.m. (qualified attendees were notified regarding acceptance.)</td>
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<tr>
<td></td>
<td>Lunch</td>
<td>12:00 p.m. – 1:00 p.m.</td>
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<tr>
<td></td>
<td>Plenary</td>
<td>1:30 p.m. – 3:00 p.m.</td>
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<tr>
<td></td>
<td>Refreshment Break</td>
<td>3:00 p.m. – 3:30 p.m.</td>
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<tr>
<td></td>
<td>Welcome Reception</td>
<td>5:30 p.m. – 7:00 p.m.</td>
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<tr>
<td>Tuesday</td>
<td>9:00 a.m. – 4:00 p.m.</td>
<td>Refreshment Break 10:00 a.m. – 10:30 a.m.</td>
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<tr>
<td></td>
<td>AeroMat Plenary</td>
<td>10:30 a.m. – 12:00 p.m.</td>
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<td></td>
<td>Lunch</td>
<td>12:00 p.m. – 1:00 p.m.</td>
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<td>Plenary</td>
<td>1:00 p.m. – 3:30 p.m.</td>
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<td>Refreshment Break</td>
<td>3:30 p.m. – 4:00 p.m.</td>
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<tr>
<td>Wednesday</td>
<td>9:00 a.m. – 4:00 p.m.</td>
<td>Refreshment Break 10:00 a.m. – 10:30 a.m.</td>
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<td></td>
<td>Refreshment Break</td>
<td>3:00 p.m. – 3:30 p.m.</td>
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Lunches provided Monday and Tuesday on the Exhibit Floor. Attendees on own for lunch Wednesday.
<table>
<thead>
<tr>
<th>Program at a Glance</th>
<th>Monday May 11</th>
<th>Tuesday May 12</th>
<th>Wednesday May 13</th>
<th>Thursday May 14</th>
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<td>p.m.</td>
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<tr>
<td>Advanced Coatings</td>
<td>Suspension/</td>
<td>Thermal</td>
<td>Engineering</td>
<td>Engineering</td>
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<td>for the Aerospace</td>
<td>Solution and</td>
<td>Barrier</td>
<td>Protection and</td>
<td>Protection and</td>
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<tr>
<td>Industry</td>
<td>Plasma-</td>
<td>Coatings (TBCs)</td>
<td>Repair of Aircraft</td>
<td>Repair of Aircraft</td>
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<tr>
<td>(JOINT</td>
<td>Spray-PVD TBCs</td>
<td>Room: 102A</td>
<td>Structural Parts 1</td>
<td>Structural Parts 3</td>
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<tr>
<td>SYMPOSIUM</td>
<td>- Novel TBC</td>
<td>3:30 p.m. -</td>
<td>Room: 102A</td>
<td>Room: 102A</td>
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<tr>
<td>with AeroMat)</td>
<td>Materials</td>
<td>5:30 p.m.</td>
<td>8:00 a.m. -</td>
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<td>Room: 102A</td>
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<td>11:30 a.m.</td>
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<td>Parts 4 Room: 102A</td>
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<td>4:50 p.m.</td>
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<tr>
<td>Fundamentals /R&amp;D</td>
<td>Suspension</td>
<td>Suspension &amp;</td>
<td>Cold Spray</td>
<td>Cold Spray</td>
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<td></td>
<td>Plasma Spray</td>
<td>Solution Thermal Spray Processing</td>
<td>Processing 3</td>
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<td>Room: 102B</td>
<td>Room: 102B</td>
<td>Room: 102C</td>
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We would like to thank the Organizing Committee, Technical Program Volunteers, Proceedings Editors, Session Chairs, and Speakers for their time and efforts in creating an outstanding ITSC Conference and Exposition.

Proceedings can be found online at asminternational.org. See page 3 for download instructions.

Monday, May 11, 2015

Cold Spray Metals and Ceramics
8:00 a.m.–12:10 p.m.
Meeting Room: 102C

Session Chairs:
Dr. Julio Villafuerte
Centerline (Windsor) Limited
Windsor, ON Canada
Dr. Oliver Stier
Siemens AG
Berlin, Germany

8:00 a.m.
Understanding the Fatigue Response of Cold Sprayed Ni based Superalloy Coatings: Dr. Dheepa Srinivasan1, Dr. Joydeep Pal1, Dr. Prasad R.V.S2, Mr. Santhosh Bangera3, Dr. Yuk-Chiu Lau3 and Mr. Lawrence levy4, 1Repair Development Center, GE Power & Water, Bangalore, India, 2Materials & Process Engineering, GE Power and Water, Schenectady, NY, 3Repair Depevopment Centre, GE Power Development, Centerline (Windsor) Limited, Windsor, ON, Canada, 4Materials & Process Engineering, GE Power and Water, Schenectady, NY, 4Repair Depevopment Centre, GE Power Development, Centerline (Windsor) Limited, Windsor, ON, Canada

8:20 a.m.
Microstructure and Properties of 6061 and 7075 Aluminum Alloys Deposited by High-Pressure Cold Spray: Mr. M. Reza Rokni1, Dr. Christian A. Widener4, Dr. Grant A. Crawford1, Dr. Michael K. West1, Mr. Victor K. Champagne2 and Mr. Michael Carter3, 1South Dakota School of Mines and Technology, Rapid City, SD, 2U.S. Army Research Laboratory, Aberdeen Proving Ground, MD

8:40 a.m.
Structure and Mechanical Properties of Thick Copper coating made by Cold Spray: Dr. Volf Leshchynsky1, Dr. Roman Gr. Maev1, Dr. Emil Strumban1, Dr. Dmitry Dzhurinskiy2 and Dr. Elena Maeva2, 1Institute for Diagnostic Imaging Research, University of Windsor, Windsor, ON, Canada, 2Physics, University of Windsor, Windsor, ON, Canada

9:00 a.m.
Role of Precursor Properties in Cold Spray Coating Process: Mr. Vikram Varadarajan and Prof. Pravansu Mohanty, Mechanical Engineering, University of Michigan, Dearborn, MI

9:20 a.m.
Mechanical Properties of WC-25/17/12Co Cermets Sprayed by HVOF and CGS: Mr. Miguel Couto1, Dr. Sergi Dosta1, Dr. I. G. Cano1, Dr. Amadeu Concustell1, Dr. Nuria Cinca1 and Prof. Josep M. Guilemany1, 1Dept. de Ciencia dels Materials i Enginyeria Metallurgica, Thermal Spray Centre (CPT)—Universitat de Barcelona, Barcelona, Spain, 2Thermal Spray Center, University of Barcelona, Barcelona, Spain

9:40 a.m.
Erosive Wear Behavior of a Wc-Ni Composite Coating Deposited by Cold Spray: Mrs. Sima Ahmad Allokh1, Prof. Richard R Chromik2, Prof. Steve Yue1, Dr. Huseyin Aydin1, Dr. Praveena Manimunda1 and Dr. Phuong Vo1, 1Department of Mining and Materials Engineering, McGill university, Montreal, QC, Canada, 2National Research Council Canada, Boucherville, Montreal, QC, Canada

10:00 a.m.–10:30 a.m.
- Refreshment Break - Meeting Space Foyer -

10:30 a.m.
Deposition Behavior and Film Property with Different Impact Velocity of Al2O3 Particle in Vacuum Kinetic Spraying System: Mr. Hyungkwon Park, Mr. Iljoo Lee, Mr. Jinyoung Kim and Prof. Changhee Lee, Division of Materials Science and Engineering, Hanyang University, Seoul, South Korea

10:50 a.m.
The Impact Behavior Alteration Depending on the Process Conditions in Kinetic Spraying of Al2O3 Particles: Mr. Jaeick Kim, Mr. Gyeongjun Byun and Prof. Changhee Lee, Division of Materials Science and Engineering, Hanyang University, Seoul, South Korea

11:10 a.m.
Room Temperature Solid-State Deposition of Alumina: Dr. Pylin Sarobol1, Dr. Michael Chandross, Dr. Jay Carroll, Dr. William Mook, Dr. Daniel Bufford, Dr. Paul Kotula, Ms. Bonnie McKenzie, Dr. Brad Boyce, Dr. Khalid Hattar and Dr. Aaron Hall, Sandia National Laboratories, Albuquerque, NM

11:30 a.m.
Preparation and Characterization of Transparent Hydrophobic Al2O3 Surface by Vacuum Cold Spray: Dr. Jie Li, Ms. Yu Zhang, Prof. Cheng-Xin Li, Prof. Xi-De Pan, Prof. Guan-Jun Yang, Xiao-Tao Luo and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China
11:50 a.m.
Investigation of the Bonding Mechanisms of Al Coatings on Ceramic Substrates Deposited by Cold Gas Spraying and Magnetron Sputtering: Mr. Rico Drehmann1, Dr. Thomas Grund1, Prof. Thomas Lampke1, Prof. Bernhard Wielage1, Mrs. Christina Wüstefeld1, Dr. Mykhaylo Motylenko2, Mr. Gerhard Schreiber2 and Prof. David Rafaja3, 1Institute of Materials Science and Engineering (IWW), Chemnitz University of Technology, Chemnitz, Germany, 2Freiberg University of Mining and Technology, Freiberg, Germany

12:10 p.m.-1:15 p.m.
Lunch • Exhibit Halls A&B

Corrosion 1
8:00 a.m.-11:30 a.m.
Meeting Room: 101A

Session Chairs:
Dr. Shiladitya Paul
TWI
Cambridge, United Kingdom
Richard Vander Straten
ES3
Syracuse, UT

8:00 a.m.
Analysis of Thermal Spraying in the Industries of Western Canada: Dr. André McDonald, Mechanical Engineering, University of Alberta, Edmonton, AB, Canada

8:40 a.m.
Twin Wire Arc Spray for Oil Field Tubulars: Mr. Joe L. Scott, ResOps LLC, Tomball, TX

9:00 a.m.
Ultraflex(TM) Coatings for Protection of Non-Line of Sight Surfaces: Mr. Douglas Kimball1, Jim faust1 and Mr. James Dezelle2, 1Kennametal, New Albany, IN, 2Energy Americas Kennametal, Inc., New Albany, IN

9:20 a.m.
Sealers in Use With Micro Arc Oxidation for Rough Service Environments in the O&G Industry: Dr. Inbar Dag and Mr. Arie Laor, PCT, Haifa, Israel

9:40 a.m.
An Evaluation of WC-10% Ni Thermal Spray Powders and HVOF Coatings, Part I: Characteristics of Powders and HVOF Coatings: Dr. Jianhong He and Dr. Thomas Wolfe, R & d, Global Tungsten and Powders, Towanda, PA

10:00 a.m.-10:30 a.m.
Refreshment Break • Meeting Space Foyer

10:30 a.m.
Enhancement of Wear and Corrosion Resistance of Carbide Based Coating Deposited by High-Velocity Liquid Fuel Thermal Spraying: Mr. Rohit Upadhyaya1, Dr. Sharad Shrivastava1, Mr. S.C Modi2 and Mr. A Modi2, 1Birla Institute of Technology and Science Pilani INDIA, Pilani, India, 2R&D, Metallizing Equipment Company, Jodhpur, India

10:50 a.m.
Surface Modification by Means of Multilayer Systems and Micro-Milling Technology: Mr. Leif Hagen1, Prof. Wolfgang Tillmann1, Mr. Dominic Stangier1, Prof. Dirk Biermann2 and Mr. Eugen Krebs3, 1Institute of Materials Engineering, Technische Universität Dortmund, Dortmund, Germany, 2Department of Machining Technology, TU Dortmund, Dortmund, Germany, 3Department of Machining Technology, Technische Universität Dortmund, Dortmund, Germany

11:10 a.m.
Breaking Behavior of Oxide Scale on the LPPS Bond Coats Surface During Pre-treatment in Vacuum: Mr. Bang-Yan Zhang, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

12:10 p.m.-1:15 p.m.
Lunch • Exhibit Halls A&B
8:00 a.m.  
Development of Thin WC-12Co Coatings Manufactured by HVOF-spraying:  Prof. Wolfgang Tillmann, Mr. Peter S. Hollingsworth, Dr. Ingor Baumann and Mr. Marcel Laschitzki, Institute of Materials Engineering, Technische Universität Dortmund, Dortmund, Germany

8:20 a.m.  
Processing Mapping and Comparison of High Velocity Oxy-Fuel (HVOF) Produced Damage Tolerant Coatings: Processing to Properties to Performance:  Mr. Andrew Vackel and Prof. Sanjay Sampath, Materials Science and Engineering, Stony Brook University, Center for Thermal Spray Research, Stony Brook, NY

8:40 a.m.  
Metal-Ceramic Nanocomposite Coatings Produced by HVOF Thermal Spray and in-situ Precipitation of Ceramic Components for Tribological Applications:  Dr. Robert Schulz and Sylvio Savoie, Materials Science, Hydro-Quebec, Varennes, QC, Canada, Hydro-Quebec, Varennes, QC, Canada

9:00 a.m.  
Investigation of the Interface of Overlapping Splats for a WC-Based Cermet:  Mr. Birger Hussong, Prof. Wolfgang Tillmann and Mrs. Vera Lünemann, Institute of Materials Engineering, Technical University of Dortmund, Dortmund, Germany

9:20 a.m.  
Residual Stresses in WC-Co Coatings In As-Sprayed And Surface-Grinded Conditions:  Dr. Vladimir Luzin, Dr. Alfredo Valarezo, Mr. Andrew Vackel and Prof. Sanjay Sampath, The Bragg Institute, Australian Nuclear Science and Technology Organisation, Sydney, Australia, Mechanical Engineering, Universidad San Francisco de Quito, Quito, Ecuador, Materials Science and Engineering, Stony Brook University, Center for Thermal Spray Research, Stony Brook, NY, Materials Science and Engineering Department, Center for Thermal Spray Research, State University of New York at Stony Brook, Stony Brook, NY

9:40 a.m.  
Improving the Fatigue Resistance of Warm Sprayed WC-CoCr Coatings by Micro-Finishing:  Prof. Wolfgang Tillmann, Dr. Jan Nebel, Mr. Christopher Schaak, Prof. Dirk Biermann, Mr. Sebastian Goek and Mr. Goetz Matthaeus, Institute of Materials Engineering, TU Dortmund, Dortmund, Germany, Institute of Machining Technology, TU Dortmund, Dortmund, Germany, Thermico USA, Inc., Charlotte, NC

10:00 a.m.-10:30 a.m.  
Refreshment Break - Meeting Space Foyer

10:30 a.m.  
Influence of the Surface Characteristics of Cr3C2-NiCr Coatings Sprayed by HVOF and HVAF on the Coefficient of Static Friction:  Dr. Lutz-Michael Berger, Mrs. Irina Shakhverdova, Mr. Roberto Puschmann, Mr. Matthias Gräfensteiner, Prof. Erhard Leidich, Ms. Saskia Schiefer and Marco Gerlach, Fraunhofer IKTS, Dresden, Germany, Fraunhofer Institute for Material and Beam Technology (IWS), Dresden, Germany, Fraunhofer IWS, Dresden, Germany, Chemnitz University of Technology, Chemnitz, Germany

10:50 a.m.  
Comparison of Residual Stress Generation in High Kinetic HVOF and HVAF Processes:  Mr. Tommi Varis, Mr. Tommi Suhonen, N/A Mika Jokipii and Mr. Jarkko Metsäjoki, Materials and Manufacturing, VTT Technical Research Centre of Finland, Espoo, Finland, Thermal Spray, VTT Technical Research Centre of Finland, Espoo, Finland

11:10 a.m.  
Tribological Properties of Hard Metal Coatings Sprayed by High Velocity Air Fuel Process:  Dr. Christoph Lyphout, Mr. Kazuto Sato, Šárka Houdková, E. Smazalova, Luca Lusvarghi, Giovanni Boletti and Paolo sassatelli, Production Engineering, University West, Trollhättan, Sweden, Thermal Spray Materials Dept., Fujimi Incorporated, Kakamigahara, Gifu Pref., Japan, VZU Plzen, Plzen, Czech Republic, Department of Engineering “Enzo Ferrari”, University of Modena and Reggio Emilia, Modena, Italy

11:30 a.m.  
Evaluation of HVAF Sprayed Cr3C2 Based Coatings by Abrasion, Erosion and Cavitation Erosion Wear Tests:  Mr. Ville Matikainen, Giovanni Boletti, Dr. Heli Koivuluoto, Luca Lusvarghi and Prof. Petri Vuoristo, Department of Materials Science, Tampere University of Technology, Tampere, Finland, Department of Engineering “Enzo Ferrari”, University of Modena and Reggio Emilia, Modena, Italy

12:10 p.m.-1:15 p.m.  
Lunch - Exhibit Halls A&B
Suspension Plasma Spray
8:00 a.m.–12:10 p.m.
Meeting Room: 102B

Session Chair:
Dr. Filofteia-Laura Toma
Fraunhofer Institute for Material and Beam Technology (IWS)
Dresden, Germany

8:00 a.m.
Comparison of Spray Techniques Depositing Fine Species: Prof. R. Vaßen, Stefan Rezanka, Nadin Schlegel, Dr. Georg Maurer and Prof. Olivier Guillou, 1Institute of Energy and Climate Research (IEK-1), Forschungszentrum Jülich GmbH, Jülich, Germany, 2Institut für Energie- und Klimaforschung IEK-1, Forschungszentrum Jülich GmbH, Jülich, Germany

8:20 a.m.
Investigation of Alumina and Yttria Coating Microstructures Manufactured by Suspension Plasma Spraying: Mrs. Emilie Aubignat, Ms. Marie-Pierre Planche, Dr. Alain Allimant, Mr. Dominique Billières and Prof. Ghislain Montavon, 1IRTES-LERMPS/UTBM, Sevenans, France, 2IRTES-LERMP, UTBM, Sevenans, France, 3Saint-Gobain C.R.E.E., Cavaillon, France, 4Saint-Gobain Coating Solutions, Avignon, France, 5University of Technology of Belfort-Montbéliard, Belfort, France

8:40 a.m.
Influence of Porosity on Thermal Properties of Columnar Suspension Plasma Sprayed Thermal Barrier Coatings: Mr. Ashish Milind Ganvir, Dr. Nicholas Curry, Dr. Nicolaie Markocsan, Prof. Per Nylen, Ms. Monika Vilemova and Dr. Zdenek Pala, 1Production Technology, University West, Trollhättan, Sweden, 2Trollhättan, Sweden, 3Production Engineering, University West, Trollhättan, Sweden, 4Institute of Plasma Physics AS CR, Prague, Czech Republic, 5IPP ASCR, Prague, Czech Republic

9:00 a.m.
Thermal Sprayed Dense Ceramic Coating Fabricated by Using Fine Particle: Mr. Kazuto Sato and Mr. Hiroyuki ibe, Thermal Spray Materials Dept., Fujimi Incorporated, Kakamigahara, Gifu Pref., Japan

9:20 a.m.
Low Cost Suspension Plasma Spraying of YSZ Coatings: Dr. Mohammed Shahien and Dr. Masato Suzuki, 1Energy Technology Research Institute, National Institute of Advanced Industrial Science and Technology, AIST, Tsukuba, Ibaraki, Japan, 2Central Metallurgical Research and Development Institute, CMIRDI, Cairo, Egypt

10:00 a.m.–10:30 a.m.
• Refreshment Break • Meeting Space Foyer •

10:30 a.m.
Control of Droplet Size in Suspension Plasma Spray Process: Dr. Masato Suzuki and Dr. Mohammed shahien, 1Energy Technology Research Institute, National Institute of Advanced Industrial Science and Technology, AIST, Tsukuba, Ibaraki, Japan, 2Toyohashi University of Technology, Toyohashi, Japan

10:50 a.m.
Homogenization of Coating Properties in Three-Cathode Atmospheric Plasma Spraying by Use of Advanced Diagnostics and Numerical Simulation—Investigations of Suspension Plasma Spraying (SPS) Process: Dr. Stephan Zimmermann, Mr. Sven Schmettlach, Dr. Sebastian Weber, Dr. Guenter Forster, Prof. Klaus Landes, Prof. Jochen Schein, Mrs. Christin Lummer, Mr. Patrick Knödler, Mr. Simon Kresnik, Dr. K. Möhwald and Prof. Hans J. Maier, 1Lab for Plasma Technology (LPT), EIT 1, Universität der Bundeswehr München, Neubiberg, Germany, 2Institute of Materials Science, Leibniz Universität Hannover, Garbsen, Germany

11:10 a.m.
Online Measurement of Size Distribution of In-flight Particles in the Suspension Plasma Spray Process: Mr. Ali Akbar Nozari, Prof. Ali Dolatabadi and Prof. Christian Moreau, Mechanical and Industrial Engineering, Concordia University, Montreal, QC, Canada

11:30 a.m.
Influence of Plasma Radiation on Temperature Measurement of In-flight Particles in Suspension Plasma Spraying: Mr. Bishop Samuel Aziz and Dr. Christian Moreau, 1Mechanical Engineering, Concordia University, Montreal, QC, Canada, 2MIE, Concordia University, Montreal, QC, Canada
11:50 a.m.
Effect of Substrate Curvature on In-flight Particle Characteristics in Suspension Plasma Spraying: Mr. Kourosh Pourang1, Prof. Christian Moreau2, and Prof. Ali Dolatabadi3, 1Concordia University, Montreal, QC, Canada, 2National Research Council of Canada (NRC), Boucherville, QC, Canada, 3Mechanical and Industrial Engineering, Concordia University, Montreal, QC, Canada

12:10 p.m.–1:15 p.m.
• Lunch • Exhibit Halls A&B •

Session Chairs:
Mr. Brian Hazel
Pratt & Whitney USA
East Hartford, CT USA
Dr. Rogerio S. Lima
National Research Council of Canada (NRC)
Boucherville, QC Canada

8:00 a.m.
Columnar Suspension Plasma Spray Thermal Barrier Coatings: Influence of Suspension Properties and Bond Coat Preparation: Dr. Nicholas Curry1, Dr. Kent VanEvery2, Mr. Johann Susnjar1, Mr. Stefan Björklund3 and Todd Snyder2, 1Research and Development, Treibacher Industrie AG, Althofen, Austria, 2Progressive Surface, Grand Rapids, MI, 3University West, Trollhättan, Sweden

8:20 a.m.
Solution Precursor Plasma Spray of Yttrium Aluminum Garnet Thermal Barrier Coatings: Dr. Eric Jordan1, Dr. Maurice Gell1, Dr. Jiwen wang1, Chen Jiang1, Mr. Jeffrey roth1 and Mr. Rishi kumar3, 1School of Mechanical Engineering, The University of Connecticut, Storrs, CT, 2Hifunda LLC, Storrs, CT, 3MSE, University of Connecticut, storrss, CT

8:40 a.m.
Process-Structure-Property Relationships in Advanced Thermal Barrier Coatings (TBC) Fabricated via Plasma Spray – Physical Vapor Deposition (PS-PVD): Mr. Michael P. Schmitt1,2, Dr. Bryan J. Harder3 and Dr. Douglas E. Wolfe1,2, 1Materials Science and Engineering, The Pennsylvania State University, University Park, PA, 2The Applied Research Laboratory, The Pennsylvania State University, University Park, PA, 3Environmental Effects and Coatings (LME), NASA Glenn Research Center, Cleveland, OH

9:00 a.m.
Thermal Barrier Coatings Performed by Suspension Plasma Spraying: Development and Characterization: Mr. Benjamin Bernard1,2, Dr. Luc Bianchi1, Mr. André MALIE3, Dr. Vincent Schlick2 and Dr. Benjamin Remy2, 1CEA DAM, Monts, France, 2Laboratoire d’Energétique et de Mécanique Théorique et Appliquée (LEMTA/CNRS), Vandeuvre-lès-Nancy Cedex, France, 3Safran Snecma, Châtellerault cedex, France

9:20 a.m.
Transient High Heat Load Performance of Thick VPS W coating on Relatively Large CuCrZr Substrate: Prof. Ke-Song Zhou and Mr. Xiao-Feng Zhang, New materials institute, Guangdong General Research Institute of Industrial Technology (Guangzhou Research Institute of Non-ferrous Metals), Guangzhou, China

9:40 a.m.
Thermal Transport Properties of Columnar Structured Zirconia Coatings Deposited by Suspension Plasma Spraying Method: Prof. Lech Pawlowski1, Mr. Pawel Sokolowski1, Dr. Dagmar Dietrich2, Prof. Thomas Lampke1 and Mr. David Jech1, 1SPCTS, University of Limoges, Limoges, France, 2Technical University of Chemnitz, Chemnitz, Germany, 3Chemnitz University of Technology, Chemnitz, Germany, 4Bmo University of Technology, Bmo, Czech Republic

10:00 a.m.–10:30 a.m.
• Refreshment Break • Meeting Space Foyer •

10:30 a.m.
Evaluating Conditions for Manufacturing Suspension Plasma TBCs: Dr. Kent VanEvery, Progressive Surface, Grand Rapids, MI

10:50 a.m.
Axial Suspension Plasma Sprayed Thermal Barrier Coatings: Dr. Zhaolin Tang1, G Masindo1, D Barentzen2 and Z Celler1, 1Northwest Mettech Corp., North Vancouver, BC, Canada, 2Northwest Mettech Corp., North Vancouver, BC, Canada

11:10 a.m.
Internal Stresses in Ytterbium Disilicate Multilayer Environmental Barrier Coatings With Calcium-Magnesium-Aluminosilicate Exposure: Dr. Fabian Stolzenburg1, Dr. Peter Kencesi2, Dr. Jonathan Almer2, Dr. Kang Lee3 and Prof. Katherine Faber4, 1Northwestern University, Evanston, IL, 2Argonne National Laboratory, Argonne, IL, 3Rolls-Royce Corporation, Indianapolis, IN
11:30 a.m.
Preparation and Characterization of Lanthanum Zirconate by Atmospheric Plasma Spray Coatings: 
Mr. Sivakumar Sankaran, Mr. Praveen Kandasamy and Dr. Gurusamy Shanmugavelayutham, Bharathiar university, Coimbatore, IA, India

11:50 a.m.
Synthesis of Rare Earth Aluminates from Pseudoboehmite and Oxides: Mr. Wilson Hernández, UMSNH, Morelia, Mexico

12:10 p.m.–1:15 p.m.
• Lunch • Exhibit Halls A&B •

Testing and Characterization 1
8:00 a.m.–11:30 a.m.
Meeting Room: 101B

Session Chairs:
Dr. Benjamin Peterson
Honeywell
Tempe, AZ USA

Mr. Scott M. Briody
Innovative Test Solutions
Scotia, NY USA

8:00 a.m.
On the Certification and Specification of WC-Co Type Powders: Mr. Andrew R. Nicoll, Thermal Spray, Switzerland, Switzerland

8:20 a.m.
A Three Dimensional Surface Finish Measuring System that Excludes Porosity to Improve Quantification of Grounded or Lapped Thermal Spray Coated Surfaces: Mr. Harold E McCormick and Mr. Will J Pisoni, C-K Engineering, Ellisville, MO

8:40 a.m.
Characterizations of Plasma Sprayed CNT Reinforced Al2O3 Coatings on Boiler Tube Steels: Mr. Rakesh Goyal1, Dr. Vikas Chawla1 and Dr. Buta Singh Sidhu2, 1Mechanical Engineering, Chitkara University, Rajpura, India, 2Mechanical Engineering, Ferozepur College of Engineering & Technology, Ferozepur, Punjab, INDIA, Ferozepur, India, 3Punjab Technical University, Kapurthala, Punjab, India

9:00 a.m.
Chemical Composition Influence on the FeMnCrSi Alloy Microstructure Deposited by HVOF: Dr. Anderson Geraldo Marenda Puksiewicz1, Mr. Rodolfo Fernando Vaz2 and Mr. Gustavo Bavaresco Sucharski3, 1Mechanical Engineering, UTFPR—Ponta Grossa, Ponta Grossa, Brazil, 2Mechanical Engineering, LACTEC Institute of Technology for Development, Curitiba, Brazil, 3Mechanical Department, Universidade Federal do Paraná, Curitiba, Brazil

9:20 a.m.
Coaxial Introductions of Resin Rods with Ceramics Nanoparticles into Gas Flame Spraying: Mr. Kazuto takai, Osaka University, Ibaraki, Japan

9:40 a.m.
Comparison of Hot Corrosion Behaviors of Thermally Sprayed NiCr and Cr3C2–NiCr Coatings Exposure to Molten Vanadium Pentoxide and Sodium Sulfate: Dr. Sukhpal Singh Chatha1, Dr. Buta Singh Sidhu2 and Dr. Hazoor s Sidhu3, 1Yadavindra College of engineering, Punjabi University Guru Kashi Campus, Talwandi Sabo, Bathinda, India, 2Punjab Technical University, Kapurthala, Punjab, India

10:00 a.m.–10:30 a.m.
• Refreshment Break • Meeting Space Foyer •

10:30 a.m.
Corrosion Testing of Thermally Sprayed Aluminium: Dr. Shiladitya Paul1, Mr. Q Y Ho2, Dr. K Yunus3, Dr. A C Fisher4 and Mr. M D F Harvey5, 1Materials Group, TWI, Cambridge, United Kingdom, 2Department of Chemical Engineering and Biotechnology, University of Cambridge, Cambridge, United Kingdom, 3Surface Engineering, TWI, Cambridge, United Kingdom

10:50 a.m.
Fe-based Powder Alloys Deposited by HVOF and HVAF for Applications Exposed to Solid Particle Erosion: Dr. Senad Dizdar1 and Mr. Manish Kumar2, 1Global Development, Höganäs AB, Höganäs, Sweden, 2Technology & Innovation, Höganäs India Pvt. Ltd, Pune, India

11:10 a.m.
Hybrid Co-Cr/W-WC and Ni-W-Cr-B/W-WC Coating Systems: Mr. Luc Vernhes1,2, Dr. Marwan Azzi3, Dr. Etienne Boussier2 and Dr. Jolanta E Klemberg-Sapieha2, 1Engineering, Velan, Montréal, QC, Canada, 2Engineering Physics, Polytechnique Montréal, Montréal, QC, Canada, 3Mechanical Engineering, Notre Dame University, Zouk Mosbeh, Lebanon

12:10 p.m.–1:15 p.m.
• Lunch • Exhibit Halls A&B •
Monday Plenary Session
1:30 p.m.-3:00 p.m.
Exhibit Halls A&B

1:30 p.m.
Dr. John Grotzinger, Chief Scientist and Head of Strategic Planning for the Mars Rover Mission

3:00 p.m.-3:30 p.m.
- Refreshment Break - Exhibit Halls A&B -

Arc Spray
3:30 p.m.-5:10 p.m.
Meeting Room: 104A

Session Chair:
Dr. James Ruud
General Electric Global Research
Delmar, NY (US)

3:30 p.m.
The effect of Preheating on the Morphology of the Lamellae of Different Steel Compositions Sprayed by ASP: Mr. Rodolpho Fernando Vaz1, Dr. Anderson Geraldo Marenda Puksasiewicz2, Dr. Ramón Sigfried Cortez Paredes3 and Mr. Andre Ricardo Capra4, 1Mechanical Engineering, LACTEC Institute of Technology for Development, Curitiba, Brazil, 2Mechanical Engineering, UTFPR—Ponta Grossa, Ponta Grossa, Brazil, 3UFPR, Curitiba, Brazil

3:50 p.m.
Controlling the Twin Wire Arc Spray Process Using Artificial Neural Networks (ANN): Dr. Karsten Hartz-Behrend1, Prof. Jochen Schein1, Dr. Jörg Schauf1 and Dr. Jochen Zierhut1, 1Lab for Plasma Technology, Universitaet der Bundeswehr Muenchen, Neubiberg, Germany, 2Zierhut Messtechnik GmbH, Muenchen, Germany

4:10 p.m.
Influence of Gas Flow Parameters and Nozzle Design on Secondary Atomization in a Rotating Twin-Wire Arc Spray System: Mr. Jean-Baptiste Devillers1, Prof. Hanlin Liao2, Dr. Jean-Marie Malhaire3 and Prof. Christian Coddet1, 1IRTES—LERMPS, University of Technology Belfort—Montbéliard, SEVENANS, France, 2IRTES-LERMPS, Université de Technologie de Belfort-Montbéliard, Belfort, France, 3ECAM Rennes—Louis de Broglie, Rennes, France

4:30 p.m.
Investigation of a Pulsed Current Wire Arc Spray Process: Mr. Stefan Kirner1, Mr. Alexander Atzberger1, Dr. Stephan Zimmermann1, Prof. Jochen Schein1 and Dr. Guenter Forster1, 1Lab for Plasma Technology (LPT), EIT 1, Universitaet der Bundeswehr Muenchen, Neubiberg, Germany, 2Universitaet der Bundeswehr Muenchen, Neubiberg, Germany

4:50 p.m.
Evolution of Microstructure and Wear Behavior of Heat-Treated and Fused Arc-Sprayed Coatings Containing FeB Crystals Dispersed in Different Steel-Based Matrices: Dr. Serge Dallaire, SYNTHESARC INC., Boucherville, QC, Canada

5:30 p.m.-7:00 p.m.
- Expo Welcome - Reception Exhibit Halls A&B -

Automotive and Heavy Duty Truck
3:30 p.m.-5:30 p.m.
Meeting Room: 101B

Session Chairs:
Dr. Montia C. Nestler
Oerlikon Metco
Westbury, NY USA
Mr. Daniel Hayden
Hayden Corporation
Springfield, MA

3:30 p.m.
Application of the Thermal Spraying Technology in Pot Hardware of CGLs: Mr. Lu Wang and Mr. Li Qingshen, BAOSTEEL-NSC AUTOMOTIVE STEEL SHEETS Co.LTD, SHANGHAI, China

3:50 p.m.
Assessment of the Properties about the Thermal Sprayed Coatings for the Thermal Barrier Applied to the Internal-Combustion Engine: Prof. KEIJI SONOYA, Masanobu Nakamura and Mr. Masashi SEKINE, Department of Mechanical System Engineering, University of Yamanashi, Kofu, Japan

4:10 p.m.
Development of Protective Coatings for A390 Alloy: Dr. Ildiko Peter1, Prof. Mario Rosso2, Christian Castella1 and Dr. Avi Bendavid2, 1Dep. of Applied Science and Tecnology, Politecnico di Torino, Torino, Italy, 2CSIRO Manufacturing Flagship, CSIRO Manufacturing Flagship, Sydney, NSW, Australia, Sydney, Australia

4:30 p.m.
Metal Matrix Composite Permanent Magnets Produced by Cold Spray: Dr. Jean-Michel Lamarre and Dr. Fabrice Bernier, National Research Council Canada, Boucherville, QC, Canada

4:50 p.m.
Wear and Corrosion Resistance of Fe-based Composite TiC Particles Reinforced Coating for Application in Hydraulic Systems: Prof. Kirsten Bobzin, Mr. Mehmet Öte, Mr. Thomas Frederik Linke and Ms. Katarzyna Maria Malik, Surface Engineering Institute, RWTH Aachen University, Aachen, Germany
5:10 p.m. Discussion

5:30 p.m.-7:00 p.m.
- Expo Welcome - Reception Exhibit Halls A&B -

Cold Spray Processing
3:30 p.m.-5:30 p.m.
Meeting Room: 102C

Session Chair:
Dr. Eric Irissou
National Research Council Canada
Boucherville, QC Canada

3:30 p.m.
Microstructure Evolution During Heat Treatment of Cold-Sprayed Ni-Ti Composite Coatings: Prof. Hamid Assadi, Department of Mechanical Engineering, Helmut Schmidt University, Hamburg, Germany

3:50 p.m.
High Dense Fe-Al Composites Made by Annealing of Cold-Sprayed Coatings: Dr. Evgeny Leshchinsky¹, Dr. Oleksandra Bielousova² and Dr. Elena Maeva³, ¹Mechanical Engineering, The University of Windsor, Windsor, ON, Canada, ²DIPI Laboratory, Ecole Nationale d’Ingenieurs de Saint-Etienne (ENISE), Saint-Etienne, France, ³Physics, University of Windsor, Windsor, ON, Canada

4:10 p.m.
Effect of Heat Treatment on the Microstructure and Properties of Cold Sprayed Ta Coating Layer: Ms. Ji-Hye Lee¹, Ms. Ji-Won Kim¹, Dr. Hyung Jun Kim² and Prof. Kee-Ahn Lee¹, ¹Department of Advanced Materials Engineering, Andong National University, Andong-si, South Korea, ²RIST, Pohang, South Korea

4:30 p.m.
Development of the Microstructured and Mechanical Properties of Cold-Sprayed IN718 Alloy Coating by a Novel In-Situ Shot Peening Process: Dr. Xiao-Tao Luo, Mr. Meng-Lin Yao and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

4:50 p.m.
Effect of Substrate Roughness on the Cratering Phenomenon in Surface Coating Using Cold Spray Process: Mr. Sébastien GOJON¹, Mr. Robin KROMER², Prof. Hanlin LIAO³, Dr. Christophe Verdy¹ and Dr. Sophie Costil², ¹IRITES-APMS, Belfort, France, ²IRITES-APMS institute, Belfort cedex, France

5:10 p.m.
Influence of Grit Blasting on the Interface Roughness and Adhesion Strength of Cold Sprayed Copper Coatings: Dr. Roman Gr. Maev¹, Dr. Volf Leshchinsky¹, Dr. Emil Strumbar¹, Dr. Dmitry Dzhurinskiy¹ and Dr. Elena Maeva², ¹Institute for Diagnostic Imaging Research, University of Windsor, Windsor, ON, Canada, ²Physics, University of Windsor, Windsor, ON, Canada

5:30 p.m.-7:00 p.m.
- Expo Welcome - Reception Exhibit Halls A&B -

Miscellaneous
3:30 p.m.-5:30 p.m.
Meeting Room: 101A

Session Chairs:
Dr. Satish Dixit
Plasma Technology Inc.
Torrance, CA USA
Mr. David Webb
ES3
Syracuse, UT USA

3:30 p.m.
Investigation of Oxidation Behavior and Evolution of Grain Morphology of Fe-Cr-Al Alloy at 1200°C and 1300°C: Ms. Yan Zhao and Prof. Yang Gao, Thermal Spraying Center of Dalian Maritime University, Dalian, China

3:50 p.m.
Antiadhesive, High Wear Resistance Coatings for Paper Industry: Dr. Hasso Jungklaus¹ and Mr. Alexander Etschmaier¹, ¹Application, Voith Paper, Laakirchen, Austria, ²R&D-TC, Voith Paper, Wimpassing, Austria

4:10 p.m.
HVOF Thermally Sprayed Ni50Cr Coatings Onto Power Plant Steels: Microstructure, Porosity and Oxidation Performance: Dr. Tanvir Hussain, Prof. D Graham McCartney, Dr. K T Voisey and Mr. Bo Song, Division of Materials, Mechanics and Structures, University of Nottingham, Nottingham, United Kingdom

4:30 p.m.
Influence of Metal Bond Coat Thickness on Adhesion Strength of APS Ceramic Coatings: Mr. John W. Barr, Laboratory, Watson Laboratory—Watson Grinding & MFG, Houston, TX
4:50 p.m.
Kinetic Metallization™ of High-Valued Military Components: Mr. Howard Gabel, Dr. Ralph Tapphorn and Mr. Travis Crowe, Inovati, Santa Barbara, CA

5:10 p.m.
Nanocomposite Boride Coating for Molten Metal Corrosion Resistance: Mr. Andrew J. Sherman, Dr. Evelina Vogli and Mr. Gabriel Santillan, Mesocoat Inc., Euclid, OH

5:30 p.m.-7:00 p.m.
- Expo Welcome - Reception Exhibit Halls A&B -

Suspension & Solution Thermal Spray
3:30 p.m.-5:30 p.m.
Meeting Room: 102B

Session Chair:
Dr. Luc Leblanc
GE-Fuel Cells
Schenectady, NY USA

3:30 p.m.
Effect of Feedstock Characteristics and Operating Parameters on the Properties of Cr2O3 Coatings Prepared by Suspension-HVOF Spraying: Dr. Filofteia-Laura Toma1, Mr. Stefan Scheitz2, Mr. Richard Trache3, Stefan Langner2, Prof. Christophrey Leyens4, Dr. Annette Potthoff5 and Mrs. Kathrin Oelschlägel5, 1Fraunhofer IWS, Dresden, Germany, 2Fraunhofer Institute for Material and Beam Technology (IWS), Dresden, Germany, 3IfWW, Technische Universität Dresden, Dresden, Germany, 4Technische Universität Dresden, Dresden, Germany, 5Fraunhofer IKTS, Dresden, Germany

3:50 p.m.
HVOF Suspension Spraying of Alumina-based Coatings: Dr. Jin-Hong Kim and Dr. Hyung Jun Kim, RIST, Pohang, South Korea

4:10 p.m.
The Effect of Fuel Ratio on Photoactivity of Suspension Flame Sprayed Coatings: Mr. Ben William Robinson5, Mr. A. Tabecki2, Ms. H. L. de Villiers Lovelock1, D. Jose1, Prof. A. Mills5, Prof. I. P. Parkin1 and Prof. J. A. Darr4, 1MCS, TWI, Cambridge, United Kingdom, 2TWI Ltd, Cambridge, United Kingdom, 3Queen’s Belfast University, Belfast, United Kingdom, 4UCL, London, United Kingdom

4:30 p.m.
Solution Precursor Plasma Sprayed Superhydrophobic Surface: Mr. Yuxuan Cai, Prof. Javad Mostaghami and Prof. Thomas W. Coyle, Centre for Advanced Coating Technologies (CACT), University of Toronto, Toronto, ON, Canada

4:50 p.m.
Lanthanum Zirconate Thermal Barrier Coating Fabricated by Solution Precursor Plasma Spray Process: Mr. Yuxuan Cai, Prof. Javad Mostaghami and Prof. Thomas W. Coyle, Centre for Advanced Coating Technologies (CACT), University of Toronto, Toronto, ON, Canada

5:10 p.m.
Lithium Iron Phosphate Coatings Deposited by Means of Inductively-Coupled Thermal Plasma: Karine Major1, Prof. Jocelyn Veilleux2 and Prof. Gesuie Brisard1, 1Chemistry, Université de Sherbrooke, Sherbrooke, QC, Canada, 2Chemical Engineering, Université de Sherbrooke, Sherbrooke, QC, Canada

5:30 p.m.-7:00 p.m.
- Expo Welcome - Reception Exhibit Halls A&B -

Thermal Barrier Coatings (TBCs)
3:30 p.m.-5:30 p.m.
Meeting Room: 102A

Session Chairs:
Dr. Rogerio S. Lima
National Research Council of Canada (NRC)
Boucherville, QC Canada

Dr. Anirudha Vaidya
Siemens Energy Inc.
Orlando, FL (US)

3:30 p.m.
Improving the Corrosion Resistance of Thermal Barrier Coatings against CMAS by Depositing top ceramic layer of Enhanced Splat Bonding: Mr. Tao Liu, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li, Dr. Xiao-Tao Luo and Prof. Chang-Ji Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

3:50 p.m.
Laser Surface Texturing Pre-Treatment before Thermal Spraying—A Way to Adapt and Control the Surface Topography to the Considered Materials and the Stresses Imposed: Mr. Robin Kromer1, Dr. Sophie Costii, Dr. Jonathan cormier2, Dr. Laurent Berthe1, Dr. Patrice peyre1 and Mr. Damien courpied4, 1IRTES-LERMS institute, Belfort cedex, France, 2Département de Physique et Mécanique des Matériaux, Institut P’, CHASSENEUIL, France, 3Laboratoire Procédés et Ingénierie en Mécanique et Matériaux, Arts&Métiers ParisTech, Paris, France

4:30 p.m.
Concept Optimization for Coating Application and Quality of APS applied TBC on Gas Turbine Blades and Vanes: Dr. Thomas Duda and Mr. Tobias Buecklers, Alstom (Switzerland), Birr, Switzerland
4:30 p.m.
Thermal Phase Stability of Various Plasma Sprayed TBCs: Dr. Li Li¹ and Dr. Benjamin Peterson¹, ¹Praxair Surface Technologies, Inc., Indianapolis, IN, ²Honeywell Aerospace, Phoenix, AZ

4:50 p.m.
Novel High Sintering-Resistant Plasma-Sprayed Thermal Barrier Coatings with Designed Large Two-Dimensional Inter-Lamellar Voids: Mr. Tao Liu, Mr. Shan-Lin Zhang, Dr. Xiao-Tao Luo, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

5:10 p.m.
Thermal Gradient Behaviour of TBCs Subjected to a Laser Gradient Test Rig: Simulating an Air-to-Air Combat Flight: Dr. Rogerio S. Lima¹, Dr. Basil R. Marple¹ and Mr. Pierre Marcoux¹, ¹National Research Council of Canada (NRC), Boucherville, QC, Canada, ²Vac Aero International, Boucherville, QC, Canada

5:30 p.m.–7:00 p.m.
• Expo Welcome • Reception Exhibit Halls A&B •

Tuesday, May 12, 2015

Cold Spray: Simulation and Particle Impact
8:00 a.m.-11:30 a.m.
Meeting Room: 102B

Session Chair:
Dr. K Anand
GE Power & Water
Bangalore, India

8:00 a.m.
A 3D Multiscale Simulation of Microscale Deposition of Cold Spray Coatings for Establishing Predictive Correlations between Atomic Material Properties and Spray Conditions: Dr. Santanu Chaudhuri, Mr. ASM Jonayat and Ms. Maria Jaromin, University of Illinois at Urbana-Champaign, Champaign, IL

8:20 a.m.
A Novel Strategy for the Deposition of Diamond Based Materials with Cold Spray and Particle Speed Analysis: Mr. Morten Christian Meyer, Dr. Rocco Lupoi and Mr. Barry Aldwell, Mechanical and Manufacturing Engineering, University of Dublin, Trinity College, Dublin, Ireland

8:40 a.m.
Design of a Cold Spraying Nozzle to Target the Optimal Deposition Velocity of Specific Powder Materials: Prof. A. Dolmatov, H. Canales and Dr. S. Markovych, National Aerospace University, Kharkiv, Ukraine

9:00 a.m.
The Importance of Optimizing Nozzle Dimensions For Cold Spray Process: Dr. Renzhong Huang and Dr. Hirota Fukunuma, Development department, Plasma Giken Co., Ltd, Saitama, Japan

9:20 a.m.
Critical Velocity Assessment of Cold Sprayed Al and Ti Alloys: Dr. Seyyed Mostafa Gangaraj¹, Atieh Moridi¹ and Prof. Mario Guagliano², ¹Dipartimento di Ingegneria Meccanica, Politecnico di Milano, Milano, Italy, ²Mechanical engineering department, Politecnico di Milano, Milano, Italy

9:40 a.m.
A Damage Based Finite Element Simulation of Cold Spray Coating Under Indentation Loading: Mrs. Atieh Moridi¹, Dr. Seyyed Mostafa Hassani-Gangaraj¹ and Prof. Mario Guagliano², ¹Mechanical engineering department, Politecnico di Milano, Milano, Italy, ²Mechanical engineering department, Politecnico di Milano, Milano, Italy

10:00 a.m.–10:30 a.m.
• Refreshment Break Exhibit Halls A&B •

10:30 a.m.
Cold Spray Impact Conditions for the Deposition of High-Performance Iron-Based Metallic Glass: Dr. David E. Cipoletti¹, Dr. Constance W. Ziemian¹, Dr. Wendelin J. Wright¹, Dr. Dennis J. Helfritch¹, Mr. Kellen V. Haile¹, Ms. Maryvivian N. Okwara¹ and Ms. Kathleen A. Hetherington¹, ¹Mechanical Engineering, Bucknell University, Lewisburg, PA, ²U.S. Army Research Laboratory, Aberdeen Proving Ground, MD, ³Bucknell University, Lewisburg, PA, ⁴Chemical Engineering, Bucknell University, Lewisburg, PA

10:50 a.m.
Deformation Behavior of Sn Particle on Different Substrates in Cold Spray: Dr. Yin Shuo, UTBM, Belfort, France
11:10 a.m.
Comparison of Impact Crater Shape and Splat of Various Targets for Estimating Projectile Velocity:
Dr. Kazunori Sakata1, Mr. Koji Tagomori1, Mr. Naoki Sugiyama1, Mr. Daisuke Oka1, Mr. Yasuhiro Shinya1, Mr. H Sasaki2, Prof. Yasuhiro Akahoshi2, Mr. K Norimitsu3, Mr. Yasuhide Fujimura3, Mr. Yuki Fukuda4 and Mr. T Koura4, 1Technical Engineering Dept., Fujikikosan Corporation, Kitakyushu, Japan, 2Sales Engineering Group, NAC Image Technology Inc., Tokyo, Japan, 3Faculty of Engineering Department of Mechanical and Control Engineering, Kyushu Institute of Technology, Kitakyushu, Japan, 4Mechanical and Control Engineering, Kyushu Institute of Technology, Kitakyushu, Japan

11:30 a.m.
Influence of Surface Oxide Film on Deposition Behaviour of Cold Spray Emulated Particle by Single Particle Shot System:
Mr. Kiyohiro Ito, Dr. Yuji ICHIKAWA and Prof. Kazuhiro OGAWA, Fracture and Reliability Research Institute, Tohoku University, Sendai, Japan

8:20 a.m.
Self-Healing Plasma Sprayed Ceramic Coatings:
Ms. Z. Ilhan1, Mr. V. Guskii2, Dr. Noriko Sata3, Dr. Aitor Hornez3, Dr. U. Weber2, Mr. Oliver Freitag2, Dr. Axel Krebs3, Dr. Günter Schiller3, Prof. S. Schmauder2, Prof. Andreas Friedrich3 and Dr. Asif Ansar4, 1Institut für Technische Thermodynamik, German Aerospace Center (DLR), Stuttgart, Germany, 2Institute for Materials Testing, Materials Science and Strength of Materials (IMWF), University of Stuttgart, Stuttgart, Germany, 3German Aerospace Center (DLR), Stuttgart, Germany, 4University of Stuttgart, Stuttgart, Germany

8:40 a.m.
M-CrAlY Bond Coats For Single And Double Layer TBCs Applied By LPPS Or HVOF:
Mr. Nelso Antolotti1, Dr. Francesco Bozza2, Mr. Enea Ghidini2, Mr. Luca Tagliaferri2 and Dr. Martin Thoma3, 1Turbocoating SPA, Rubbiano di Solignano (PR), Italy, 2R & D, Turbocoating S.p.a., Rubbiano di Solignano (PR), Italy, 3Consultant, Munich, Germany

9:00 a.m.
A Double Layer Thermal Barrier Concept Made of Gadolinium Zirconate and YSZ:
Ms. Emine Bakan, Dr. D.E. Mack, Dr. Georg Mauer and Prof. Robert Vaßen, Institute of Energy and Climate Research (IEK-1), Forschungszentrum Jülich GmbH, Jülich, Germany

9:20 a.m.
ALSTOM K4-Injector-Block - Advanced HVOF-Spraying for Future Applications:
Mr. Johannes Clemens Schab1, Dr. Sven Olliges1, Mr. Benjamin-Timo Zoller4, Dr. Julien René André Zimmermann1, Dr. Piero-Daniele Grasso1, Dr. Alexander Stankowski2, Prof. Christoph Leyens3, 1TS-TRRR, Alstom (Switzerland) Ltd, Baden, Switzerland, 2Alstom (Switzerland) Ltd, Baden, Switzerland, 3Technische Universität Dresden, Dresden, Germany

9:40 a.m.
Modular coating for Flexible Gas Turbine Operation:
Dr. Julien René André Zimmermann, Mr. Johannes Clemens Schab, Dr. Alexander Stankowski, Dr. Piero-Daniele Grasso, Dr. Sven Olliges and Prof. Christoph Leyens, TS-TRRR, Alstom (Switzerland) Ltd, Baden, Switzerland
10:30 a.m.
Assessment of Ni-20 Cr and WC-Co Coatings Applied by Detonation-Gun Process at 900°C: Dr. Gagandeep Kaushal1, Dr. Harpreet Singh2 and Dr. Satya Prakash3, 1Yadavindra College of Engineering, Punjabi University, Talwandi Sabo, Bathinda, India, 2School of Mechanical, Material and Energy Engineering, Indian Institute of Technology Ropar, Rupnagar, India, 3Department of Metallurgical and Materials Engineering, Indian Institute of Technology, Roorkee, India

10:50 a.m.
Corrosion Protection of Boiler Components Using an Arc Sprayed Cladding Material: Mr. Leo Vinod Marcus Antony, Alstom Power Turbomachines LLC, Chattanooga, TN

11:10 a.m.
Thermally Sprayed Coatings For Supercritical Steam Power Plants: High Temperature And Fireside Corrosion Behavior: Mr. Nelso Antolotti1, Dr. Francesco Bozza1, Mr. Enea Ghidini1, Mr. Luca Tagliaferr1 and Dr. Martin Thoma1, 1Turbocoating S.p.a., Rubbiano di Solignano (PR), Italy, 2&R D, Turbocoating S.p.a., Rubbiano di Solignano (PR), Italy, 3Consultant, Munich, Germany

8:40 a.m.
Metallization of Polymeric Substrates by Cold Spray—Is it Possible?: Dr. Julio Villafuerte1, Dr. Jianfeng Wang2 and Dr. Harvey Ye3, 1Corporate, Centerline (Windsor) Limited, Windsor, ON, Canada, 2SST, Centerline (Windsor) Limited, Windsor, ON, Canada

9:00 a.m.
Spall Resistant HVOF Coatings: Mr. David Webb, R&D, ES3, Clearfield, UT

9:20 a.m.
Mechanism of Calcareous Deposit formation on TSA-coated Steel Structures at Elevated Temperatures: Dr. Shiladitya Paul1, Ms. N S Zulkfli2, Dr. K Yunus2, Dr. A C Fisher2 and Mr. M D F Harvey3, 1Materials Group, TWI, Cambridge, United Kingdom, 2Department of Chemical Engineering and Biotechnology, University of Cambridge, Cambridge, United Kingdom, 3Surface Engineering, TWI, Cambridge, United Kingdom

9:40 a.m.
Improving the Adhesion of Wear-Resistant Coatings on Aerospace Polymer Composites: Ms. Axelle Elrikh1, Dr. Simon Goutier1, Dr. Gordon Armstrong2 and Prof. Armelle Vardelle1, 1European Ceramic Center, University of Limoges, Limoges, France, 2Materials and Surface Science Institute, University of Limerick, Limerick, Ireland

10:00 a.m.–10:30 a.m.
• Refreshment Break Exhibit Halls A&B •

10:30 a.m.
Coaxial Laser Assisted Cold Sprayed WC–Co Coatings: Microstructure and Mechanical Properties: Mr. Praneet Talwar, Mr. Vikram Varadarajan and Prof. Pravansu Mohanty, Mechanical Engineering, UNIVERSITY OF MICHIGAN DBN, Dearborn, MI

10:50 a.m.
Process-Property Correlation of Heat Treated Aluminium 6061 Cold Spray Coatings: Mr. Kelvin Loke, ST Kinetics Integrated Engineering Pte Ltd, Singapore, Singapore
11:10 a.m.
Effect of Friction-Stir Processing on the Wear Rate of WC-Based MMC Coatings Deposited by Low Pressure Cold Gas Dynamic Spraying: Mr. Sayed Hossein Ashrafizadeh, Mr. Adrian Lopera-Valle, Dr. Adrian Gerlich and Dr. André McDonald, Mechanical Engineering, University of Alberta, Edmonton, AB, Canada, Mechanical and Mechatronics Engineering, University of Waterloo, Waterloo, ON, Canada

12:00 p.m.-1:00 p.m.
Lunch • Exhibit Halls A&B •

Session Chair:
Prof. Ali Dolatabadi
Concordia University
Montreal, QC Canada

8:00 a.m.
Modeling of the APS Process: From the Arc to the Coating Effective Properties: Dr. Rodolphe BOLOT, Ms. Emilie Aubignat, Ms. Marie-Pierre PLANCHE, Dr. Alain Allimant, Mr. Dominique Billières and Prof. Ghislain montavon, 1IRTES-LERMPS, University of Technology of Belfort-Montbéliard, Belfort, France, 2IRTES-LERMPS/UTBM, Sevenans, France, 1IRTES-LERMPS, UTBM, Sevenans, France, 2Saint-Gobain C.R.E.E., Cavaillon, France, 2Saint-Gobain Coating Solutions, Avignon, France

8:40 a.m.
Coupled Smoothed-Particle Hydrodynamics and Phase Field Modeling of Particle Solidification in Thermal Spray: Mr. Tatu Pinomaa, Nana Ofori-Opoku, Mr. Anssi Laukkana and Prof. Nikolas Provatas, 1VTT Technical Research Centre of Finland, Espoo, Finland, 2McGill University, Montreal, QC, Canada

9:00 a.m.
Mesoscale Material Modeling of Virtually Generated Thermal Spray Coatings: Mr. Tatu Pinomaa, Mr. Tom Andersson, Nana Ofori-Opoku, Mr. Anssi Laukkana and Prof. Nikolas Provatas, 1VTT Technical Research Centre of Finland, Espoo, Finland, 2McGill University, Montreal, QC, Canada

9:20 a.m.
Residual Stress Development During Deposition and Cooling in Thermal Spray Coating Process: Prof. Abul Fazal M. Arif, Mr. M. Usama Siddiqui and Prof. Javad Mostaghimi, Mechanical Engineering, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia, 2Centre for Advanced Coating Technologies (CACT), University of Toronto, Toronto, ON, Canada

9:40 a.m.
Experimental Investigation and Finite Element Simulation of Residual Stress Development in Thermally Sprayed Coatings: Mr. Mohamed Elhoriny, Mr. Martin Wenzelburger, Dr. Andreas Killinger and Prof. Rainer Gadow, 1MTCC, University of Stuttgart, Stuttgart, Germany, 2GSAE, University of Stuttgart, Stuttgart, Germany

10:00 a.m.-10:30 a.m.
Refreshment Break Exhibit Halls A&B •

10:30 a.m.
Parametric Study of Plasma Torch Operation Using a MHD Model Coupling the Arc and Electrodes: Dr. Maher Alaya, Dr. Christophe Chazelas and Prof. Armelle Vardelle, European Ceramic Center, University of Limoges, Limoges, France

10:50 a.m.
Robot Kinematic Analysis For Torch Setup Optimization In Thermal Spraying: Mr. Chaoyue CHEN, Dr. Sihao DENG, Prof. Hanlin LIAO and Prof. Ghislain montavon, 1IRTES-LERMPS, University of Technology of Belfort-Montbéliard, Belfort, France, 2IRTES-LERMPS, UTBM, Sevenans, France, 2Saint-Gobain Coating Solutions, Avignon, France

11:10 a.m.
Investigation of Flow Parameters in Wire Arc Thermal Spraying using CFD Simulation: Mr. Amrismam Farrokhpanah, Mr. Julien Naaffrechoux, Dr. Larry Pershin and Prof. Javad Mostaghimi, 1Centre for Advanced Coating Technologies (CACT), University of Toronto, Toronto, ON, Canada, 2Thermal and Energy Sciences, Polytech Nantes, Graduate School of Engineering, Nantes, France

11:30 a.m.
Taguchi Design and Analysis of 3D-Computer Fluid Dynamic (CFD) Experiments (TDACE) for the Optimization of Air-Cap Configuration in Arc Spraying: Mr. Mohamed Abdulgader, Prof. Wolfgang Tillmann, Mr. Nassir Anjami and Mr. Diego Bezerra, 1Institute of Materials Engineering, Technische Universität Dortmund, Dortmund, Germany, 2Institute of Materials Engineering, Technical University of Dortmund, Dortmund, Germany

12:00 p.m.-1:00 p.m.
Lunch • Exhibit Halls A&B •
Novel Processes
8:00 a.m.–11:50 a.m.
Meeting Room: 102C

Session Chairs:
Prof. Chang-Jiu Li
State Key Laboratory for Mechanical Behavior of Materials,
Xi’an Jiaotong University
Xi’an, China
Dr. Majid Nabari
State Key Laboratory for Mechanical Behavior of Materials,
Xi’an Jiaotong University
Xi’an, China

8:00 a.m.

8:20 a.m.
High Stability, High Enthalpy APS Process Based on Combined Wall and Gas Stabilizations of Plasma (Part 2. Coating Formation and Properties): Dr. Paolo Mor1 and Dr. Vladimir Belashchenko2, 1Flame Spray North America, Fountain Inn, SC, 2Thermal Spray Development Inc, Waltham, MA

8:40 a.m.
Three-Zone Anode Geometry—The Disengagement of Classic Nozzle Design for Atmospheric Plasma Spraying: Mr. Sebastian Mihn1, Mr. Georg Thomas1 and Mr. Rolf Kuhn1, 1ALSTOM (Switzerland) Ltd, Baden, Switzerland, 2Department of Joining and Coating Technology, IWF, Technical University of Berlin, Berlin, Germany, 3Medicoat AG, Mägenwil, Switzerland

9:00 a.m.
Application of Mist Air Cooling Technique to Various Type Thermal Spraying Gun: Mr. Takashi Kumaî1, Mr. Yusuke Nishiura1, Mr. Yasuhiro Ohmori1, Mr. Yoshio Shin1 and Mr. Toshiharu Morimoto2, 1Yoshikawa Kogyo, Himeji, Japan, 2Nakayama Amorphous, Osaka, Japan

9:20 a.m.
Introducing “The eGun SystemTM” an Evolution in HVOF Technology: Mr. Terry Wilmert, Flame Spray Technologies, Inc, Grand Rapids, MI

9:40 a.m.

10:30 a.m.
The Role of Nucleation and Growth in Plasma Spray-Physical Vapor Deposition: Dr. Georg Mauer, Stefan Rezanka, Dr. Andreas Hospach and Prof. Robert Vaßen, Institut für Energie- und Klimaforschung IEK-1, Forschungszentrum Jülich GmbH, Jülich, Germany

10:50 a.m.
Microstructural Effects and Properties of Non-Line of Sight Coating Processing via Plasma Spray-Physical Vapor Deposition: Dr. Bryan J. Harder1, Michael P. Schmitt2 and Dr. Douglas E. Wolfe3, 1Environmental Effects and Coatings (LME), NASA Glenn Research Center, Cleveland, OH, 2The Pennsylvania State University, University Park, PA

11:10 a.m.
Fully Nano-Equiaxed-Structured Ceramic Coating Deposited Using Plasma Spraying in the Different Pressure Environments: Prof. Yang Gao1, Ms. Yan Zhao1, Dr. Chengqi Sun1, Mr. Jianyi Gao2 and Dr. Deming Yang3, 1Thermal Spraying Center of Dalian Maritime University, Dalian, China, 2Arizona State University, Tempe, AZ

11:30 a.m.
TixAlyN Coating Manufacturing by Reactive Very Low Pressure Plasma Spraying (R-VLPPS): Ms. Beatrice Vautherin1, Prof. Ghislain Montavon1, Ms. Marie-Pierre Planche1, Dr. Aurelie Quet2 and Mr. Luc Bianchi2, 1IRTES-LERMPS, UTBM, Sevenans, France, 2CEA Le Ripault, Monts, France

12:00 p.m.–1:00 p.m.
Lunch • Exhibit Halls A&B •

Testing and Characterization 2
8:00 a.m.–9:20 a.m.
Meeting Room: 101B

Session Chairs:
Mr. Scott M. Briody
Innovative Test Solutions
Scotia, NY USA
Dr. Benjamin Peterson
Honeywell
Tempe, AZ USA

8:00 a.m.
Porosity Measurement of YSZ Ceramic Coating Deposited with Different Parameters Deposition by Different Methods of Characterization: Mr. João Paulo Gabre Ferreira1, Mrs. Karen Juliana Vanat2, Dr. Luciano Augusto Lourenço1, Dr. Anderson Geraldo1, 1Thermal Spraying Center of Dalian Maritime University, Dalian, China, 2Arizona State University, Tempe, AZ
Substrate Influence on Cold Gas Sprayed Titanium Coatings: Dr. María Villa, N/A Felix Haeussler, Prof. H. Assadi, Dr. Frank Gaertner and Prof. Thomas Klasen, Department of Mechanical Engineering, Helmut Schmidt University, University of the Federal Armed Forces Hamburg, Hamburg, Germany

Thermally Sprayed Coatings as Corrosion Protection for Steel Structures—Influence of Manufacturing Processes on the Coatings Quality: Dr. Teodora Maghet, Mr. Thomas Wilhelm, Mr. Jörg Mährlein, Mrs. Susanne Friedrich, Mrs. Romy Regenspurger and Dr. Monica Sallai, GSI SLV-Duisburg, Duisburg, Germany, ²IKS Dresden, Dresden, Germany

10:00 a.m.-10:30 a.m. - Refreshment Break • Exhibit Halls A&B •

Biomedical 1
10:30 a.m.-11:50 a.m.
Meeting Room: 101B

Session Chairs:
Dr. Rajan Bamola
Surface Modification Systems Inc.
Santa Fe Springs, CA USA

Mr. Richard Vander Straten
ES3 Inc.
Syracuse, UT (US)

10:30 a.m.
Evolving Architecture of Dental Implants for Osseointegration: Dr. Rajan Bamola, Surface Modification Systems Inc., Santa Fe Springs, CA

10:50 a.m.
Vacuum Plasma Spray (VPS) System Considerations for Plasma Spraying Titanium Coatings for Biomedical Applications: Dr. Robert Gansert, Advanced Materials & Technology Services, Inc, Simi Valley, CA

Microstructural Characterization of Cold Sprayed Copper-Tungsten Metal Matrix Composites: Dr. Aaron Hall and Dr. Pylin Sarobol, Sandia National Laboratories, Albuquerque, NM

Improving Cold Sprayability: Mixed Metal Powders: Prof. Stephen Yue, Dr. Huseyin Aydin, Dr. Phuoi Vo, Rosaire Mongrain, Rajib Barua and Dr. Richard Dolbec, ¹Mining and Materials Engineering, McGill University, Montreal, QC, Canada, ²Department of Mining and Materials Engineering, McGill University, Montreal, QC, Canada, ³National Research Council Canada, Boucherville, Montreal, QC, Canada, ⁴McGill University, Montreal, QC, Canada, ⁵McGill University, Montreal, QC, Canada, ⁶Tekna Plasma Systems Inc, Sherbrooke, QC, Canada
4:40 p.m.
Cold Spraying of Plastic Composites Powder: Mr. Kazuto Sato and Mr. Junya Yamada, Thermal Spray Materials Dept., Fujimi Incorporated, Kakamigahara, Gifu Pref., Japan

5:00 p.m.
Mechanistic Study and Characterization of Cold Sprayed Ultra High Molecular Weight Polyethylene-Nano Ceramic Composite Coating: Mr. KESAVAN RAVI, Dr. Yuji ICHIKAWA, Prof. Kazuhiro OGAWA, Ms. TIANA DEPLANKE, Prof. OLIVIER LAME and Prof. Jean-Yves CAVAILLE, Fracture and Reliability Research Institute, TOHOKU UNIVERSITY, SENDAI, Japan, Fracture and Reliability Research Institute, Tohoku University, Sendai, Japan, MATEIS, INSA LYON, LYON, France

5:20 p.m.
Effect of Substrate Preparation on the Adhesion Strength of Aluminum Alloy Sprayed Using Cold Spray Process: Mr. Sébastien GOJON, Mr. Robin KROMER, Prof. Hanlin LIAO, Dr. Christophe Verdy and Dr. Sophie Costil, IRTES-LERMPS institute, Belfort, France

7:00 p.m. - 10:00 p.m.
- Social Event - Queen Mary
Transportation Provided at Hyatt Regency and Hyatt Pike
*Ticket Required & Sold Separately

4:40 p.m.
Performance Characteristics of Strain Tolerant TBC: Dr. Purush Sahoo, American Surface Modifications, Houston, TX

4:00 p.m.
The Effect of Complex Geometrical Variations within the Spray Footprint on Thermal Barrier Coating Properties: Mr. Mitchell L. Sesso, Prof. Christopher C. Berndt, Dr. John Thornton and Ms. Sun Yung Kim, Industrial Research Institute Swinburne (IRIS), Swinburne University of Technology, Hawthorn, VIC, Australia, Air Vehicles Division, DSTO, Melbourne, Australia

4:20 p.m.
Advanced Cold Spray Development for Aerospace Aluminum Alloys: Mr. Victor K. Champagne, U.S. Army Research Laboratory, Aberdeen Proving Ground, MD

4:00 p.m.
Atmospheric Plasma Spraying of Self-Healing Thermal Barrier Coatings: Mrs. Denise Koch, Dr. Yoo J. Sohn and Prof. Robert Vaßen, Institut für Energie- und Klimaforschung I Ek-1, Forschungszentrum Jülich GmbH, Jülich, Germany
TECHNICAL PROGRAM • TUESDAY, MAY 12, 2015

4:40 p.m.
Evaluation of Powder Properties on the Performance of Cold Sprayed Ti6Al4V for Aerospace Repairs: Dr. Tiziana Marrocco1, Philip McNutt1, Dr. Roger Barnett2, Dr. Simone Vezzù2, Enrico Vedelago3, Prof. Mario Guagliano4, Dr. Seyyed Mostafa Hassani-Gangaraj5, Dr. Pedro Poza6, Dr. C.J. Munez7, Miguel Angel Garrido-Maneiro8, A. Rico9, Robert Defley9, Antonio Aragon-Ortiz9 and Ms. H L de Villiers Lovelock1, 1TWI Ltd, Cambridge, United Kingdom, 2Ingenieria de SPF, Airbus Military (CBC Plant), El Puerto de Santa Maria (Cadiz), Spain, 3Mechanical engineering department, Politecnico di Milano, Milano, Italy, 4Mechanical Engineering Department, Politecnico di Milano, Milano, Italy, 5GE Avio s.r.l., Rivalta di Torino, Italy, 6GE Avio s.r.l., Brindisi, Italy

5:00 p.m.
Cold Spray of Al Alloys as Repair Technology in Aeronautics: Dr. Simone Vezzù1, Enrico Vedelago3, Mr. Peter Richter Sr2, Mr. Peter Richter Jr3, Prof. Mario Guagliano4, Mrs. Atieh Moridi3, Dr. Pedro Poza4, Dr. C.J. Munez7, Dr. Giovanni Paolo Zanon8 and Dr. Giovanni Alfeo6, 1Veneto Nanotech, Venice, Italy, 2Impact Innovations GmbH, Rattenkirchen, Germany, 3Mechanical engineering department, Politecnico di Milano, Milano, Italy, 4Universidad Rey Juan Carlos, Mostoles, Spain, 5GE Avio s.r.l., Rivalta di Torino, Italy, 6GE Avio s.r.l., Brindisi, Italy

5:20 p.m.
The Measurement of Residual Stresses in Cold Sprayed Nickel Based Superalloys via Neutron Diffraction: Ms. Sun Yung Kim1, Dr. Vladimir Luzin2, Dr. John Thornton3, Dr. Peter King4, Dr. Darren Fraser4, Mr. Mitchell L. Sesso5, Mr. Stefan Gulizia6, Dr. Yat Choy Wong7 and Prof. Christopher C. Berndt8, 1Industrial Research Institute Swinburne (IRIS), Swinburne University of Technology, Hawthorn, VIC, Australia, 2The Bragg Institute, Australian Nuclear Science and Technology Organisation, Sydney, Australia, 3Air Vehicles Division, DSTO, Melbourne, Australia, 4Manufacturing Flagship, CSIRO, Melbourne, Australia

7:00 p.m.-10:00 p.m.
- Social Event* - Queen Mary
Transportation Provided at Hyatt Regency and Hyatt Pike - *Ticket Required & Sold Separately

4:00 p.m.
Impacts of Alternative Fuels on the Evolution and Stability of Turbine Hot-Section Materials: Mr. Daniele R. Mumm, Mr. Timothy J. Montalbano and Mr. Matthew H. Sullivan, Dept. of Chemical Engineering & Materials Science, University of California, Irvine, Irvine, CA

4:40 p.m.
Navy Valve Actuator Repair Using Cold Spray: Dr. Christian A. Widener1,2, Mr. Robert Hrabe3, Mr. Thomas Stamey1, Mr. Benjamin Hoiland4, Mr. Michael Carter1 and Mr. Victor K. Champagne5, 1Arbegaig Materials Processing and Joining Lab, South Dakota School of Mines and Technology, Rapid City, SD, 2VRC Metal Systems, Rapid City, SD, 3Puget Sound Naval Shipyard, Bremerton, WA, 4Mid-America Aviation / MOOG, Grand Forks, NE, 5U.S. Army Research Laboratory, Aberdeen Proving Ground, MD

5:00 p.m.
Surface Modification of Austenitic Thermal Spray Coatings by Low-Temperature Nitration: Mr. Thomas Lindner1, Mr. Thomas Mehner2, Mr. Gerd Paczkowski3 and Prof. Thomas Lampke3, 1Institute of Materials Science and Engineering, Chemnitz University of Technology, Chemnitz, Germany, 2Chemnitz University of Technology, Chemnitz, Germany, 3Institute of Materials Science and Engineering (IWW), Chemnitz University of Technology, Chemnitz, Germany

5:20 p.m.
The Percarbonate Stripping System for Thermal Spray (TS) Coatings-A Success Story at Tinker Air Force Base (TAFB): Mr. John P. Sauer1, Mr. Justin Sneed2 and Mr. Dave Fairbourn3, 1Sauer Engineering, Cincinnati, OH, 2Tinker Air Force Base, Oklahoma City, OK, 3Aeromet Technologies, Sandy, UT

7:00 p.m.-10:00 p.m.
- Social Event* - Queen Mary
Transportation Provided at Hyatt Regency and Hyatt Pike - *Ticket Required & Sold Separately
Session Chair:
Dr. Rodolphe BOLOT
University of Technology of Belfort-Montbéliard
Belfort, France

4:00 p.m.
A Numerical Investigation: Air Plasma Spraying by means of a Three-Cathode Spraying Torch: Prof. Kirsten Bobzin and Mr. Mehmet Öte, Surface Engineering Institute, RWTH Aachen University, Aachen, Germany

4:20 p.m.
Effect of Turbulence Modulation on Three Dimensional Trajectories of Powder Particles in Plasma Spray Process: Dr. Romesh Batra¹, Dr. Shen Shang¹ and Mr. Michael Cybulsky², ESM, VirginiaTech, BLACKSBURG, VA, ¹Materials, Rolls-Royce Corporation, Indianapolis, IN

4:40 p.m.
Molecular Dynamics Simulation of Nano-Scale Ceramic Particle Connection Derived by High Velocity Collision: Prof. Guan-Jun Yang, Prof. Cheng-Xin Li, Prof. Chang-Jiu Li and Guang-Rong Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

5:00 p.m.
Fast Coating Deposition Simulation for Path Planning and Iterative Net-Shape Optimization on Complex Workpieces: Mr. T. Wiederkehr¹, Prof. Wolfgang Tillmann¹, Mr. Leif Hagen¹, Prof. H. Müller¹ and Mr. Daniel Hegels¹, ¹Computer Science VII—Computer Graphics, Technische Universität Dortmund, 44227 Dortmund, Germany, ²Institute of Materials Engineering, Technische Universität Dortmund, Dortmund, Germany

Session Chair:
Prof. Armelle Vardelle
University of Limoges
Limoges, France

4:00 p.m.
Droplet And Particle Dynamics In Solution Precursor Plasma Spraying: Mr. William Duarte¹, Dr. Simon Goutier², Prof. Sylvie Rossignol², Prof. Armelle Vardelle¹ and Prof. Michel Vardelle¹, ¹University of Limoges, Limoges, France, ²European Ceramic Center, University of Limoges, Limoges, France

4:20 p.m.
Effect of Substrate Roughness and Topography on Splat Formation in Suspension Plasma Spraying: Mr. Guillaume bidron, Dr. Simon Goutier, Dr. Paule Denoirjean and Prof. Michel Vardelle, European Ceramic Center, University of Limoges, Limoges, France

4:40 p.m.
Modeling of The Self-assembly of Nanoparticles into Branched Solid Aggregates for a Suspension Droplet: Mr. He Zhang and Prof. Yanguang Shan, School of Energy and Power Engineering, University of Shanghai for Science and Technology, Shanghai, China

5:00 p.m.
Ceramics Filler Rods Feeding for Gas Flame Torch in Thermal Nanoparticles Spraying: Dr. Soshu Kiri-hara, Joining and Welding Research Institute, Osaka University, Ibaraki, Japan
Wednesday, May 13, 2015

Biomedical 2
8:00 a.m.–9:40 a.m.
Meeting Room: 101B

Session Chair:
Dr. Rajan Bamola
Surface Modification Systems, Inc.
Santa Fe Springs, CA

Mr. Richard Vader Straten
ES3 Inc.
Syracuse, UT (US)

8:00 a.m.
The Role of Thermal Spray In Medical Applications: Beyond Implants: Dr. Rajan Bamola, Surface Modification Systems Inc., Santa Fe Springs, CA

8:20 a.m.
Characterisation and In Vitro Corrosion Resistance of Plasma Sprayed Hydroxyapatite and Hydroxyapatite—Silicon Oxide Coatings on 316L SS: Dr. Gurpreet Singh1, Dr. Hazoor Singh2 and Dr. Buta Singh Sidhu3, 1Mechanical Engineering Department, Punjabi University Patiala, Patiala, India, 2Yadavindra College of Engineering, Punjabi University,, Bathinda, Punjab, India, 3Academics, Punjab Technical University, Kapurthala, Punjab, India

8:40 a.m.
Mechanical Properties of Carbonated Biomimetic Nanocrystalline Apatite Coatings Obtained by Cold Spray: Ms. Emmanuelle KerGourlay1, Dr. David Grossin1, Dr. Joel Alexis1, Dr. Sergi Dosta2, Dr. Núria Cinca3, Dr. I. G. Cano3, Prof. Jose Maria Guilemany3, Prof. Ghislaine Bertrand3 and Prof. Christian Rey1, 1Université de Toulouse, CIRIMAT, UMR 5085 INPT-CNRS-UPS, Toulouse, France, 2Université de Toulouse, LGP, Tarbes, France, 3Thermal Spray Center, Universitat de Barcelona, Barcelona, Spain, 4CPT—Thermal Spray Centre, Universitat de Barcelona, Barcelona, Barcelona, Spain, 5Dept. de Ciencia dels Materials i Enginyeria Metal·lúrgica, Thermal Spray Centre (CPT)—Universitat de Barcelona, Barcelona, Spain

9:00 a.m.
Hydroxyapatite Powders for Plasma Spray Coating Of Implantable Devices: Ms. Rose Catherin, Medical-Group, Corp. France, Vaulx-en-Velin, France

9:20 a.m.
Bioactivity Glass Coatings Elaborated by Plasma Spraying from 31SiO2-11P2O5-(58-x) CaO- x MgOPowders: Mrs. Mónica Monsalve1,2, Mrs. Hélène Ageorges3, Mrs. Esperanza López3, Mr. Fabio Vargas1 and Mr. Francisco Bolivar1, 1Universidad de Antioquia, Medellin, Colombia, 2UMR CNRS 6638, Science des Procédés Céramiques et de Traitements de Surface, Limoges, France
9:00 a.m.
Influence of Pretreatment on the Growth Behavior of TGO on MCrAlY Bond Coat Surface: Mr. Bang-Yan Zhang, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

9:20 a.m.
Cold Sprayed CoNiCrAlY Bond Coats for Thermal Barrier Coatings Applications: Dr. Cristian V. Cojocaru and Dr. Eric Irisso, National Research Council of Canada, Boucherville, QC, Canada

9:20 a.m.
The Shear Test in Acc. with DIN EN 15.340: Advantages, Disadvantages, Improvements and Important Directions: Mr. Sven Hartmann, obz innovation gmbh, Bad Krozingen, Germany

9:40 a.m.
Characterization Of High-Velocity Single Particle Impacts On Thermally Sprayed Ceramic Coatings: Mr. Jarkko Kiilakoski, Mr. Matti Lindroos, Mr. Ville Matikainen, Dr. Marian Apostol, Dr. Heli Koivuluoto and Prof. Petri Vuoristo, Department of Materials Science, Tampere University of Technology, Tampere, Finland

8:00 a.m.-10:00 a.m.
Meeting Room: 104A

Session Chair:
Mr. Scott M. Briody
Innovative Test Solutions
Scotia, NY USA

8:00 a.m.
Stress Formation within the First Layer in Plasma Sprayed Coatings: Mr. Markus Mutter, Dr. R. Mücke, Dr. Georg Mauer, Prof. Robert Vaßen, Mr. Hyoung Chul Back and Dr. Jens Gibmeier, 1Institute of Energy and Climate Research (IEK-1), Forschungszentrum Jülich GmbH, Jülich, Germany, 2Institut für Energie- und Klimaforschung IEK-1, Forschungszentrum Jülich GmbH, Jülich, Germany, 3Karlsruher Institut für Technologie, Karlsruhe, Germany

8:20 a.m.
Influence of Residual Stress on the Wear Resistance of Thermal Spray Coatings: Mr. Mohamed Abdulgader, Prof. Wolfgang Tillmann, Mr. Peter S. Hollingsworth, Mr. Weifeng Luo and Dr. Ursula Selvadurai, Institute of Materials Engineering, Technical University of Dortmund, Dortmund, Germany

8:40 a.m.
Mechanical Properties of Thermal Sprayed Substrates: Dr. Eklavya Calla, Dr. Vishwanathan Venkatachalapathy, Dr. Joydeep pal and Dr. K Anand, Materials & Process Engineering, GE Power & Water, Bangalore, India

8:40 a.m.
A Novel Coaxially Laser-Assisted (COLA) Cold Spray System: Dr. Chris Allen, Ms. H L de Villiers Lovelock, Dr. Tiziana Marrocco and Philip McNutt, Lasers and Sheet Processes, TWI Ltd, Cambridge, United Kingdom, TWI ltd, Cambridge, United Kingdom

8:40 a.m.
Coaxial Laser Assisted Cold Spray Technology: Mr. Vikram Varadarajan and Prof. Pravansu Mohanty, Mechanical Engineering, University of Michigan, Dearborn, MI

9:00 a.m.
Pitfalls of Spray Coating Analyses: Dr. Frank Gaertner, Mr. Matthias Schulze, Mrs. Camilla Schulze, Mr. Uwe Wagener, Mr. Thomas Breckwoldt, Dr. Kurt Binder, Prof. Hamid Assadi and Prof. Thomas Klassen, Department of Mechanical Engineering, Helmut Schmidt University, University of the Federal Armed Forces Hamburg, Hamburg, Germany

9:00 a.m.
Cold Spray Deposition on Heated Substrates: Dr. Eklavya Calla, Dr. K Anand, Dr. Vishwanathan Venkatachalapathy, Mr. Praveen R and Ms. Vijayalakshmi SR, Materials & Process Engineering, GE Power & Water, Bangalore, India, GE-Global Research Center, Bangalore, India
9:20 a.m.
Electron Microscopy and EBSD Characterization of Cold Sprayed IN625 Coatings on 4130 Steel: Dr. Dheepa Srinivasan1, Mr. Ramar Amuthan2, Mr. Yuk-Chiu Lau2, Mr. Atanu Chaudhuri3, Mr. Y Raghupathy3, Prof. Satyam Suwas4 and Prof. Chandan Srivastava5,
1Repair Development Center, GE Power & Water, Bangalore, India, 2GE Global Research, Bangalore, India, 3General Electric Global Research, Niskayuna, NY, 4Materials Engineering, Indian Institute of SCience, Bangalore, India

9:40 a.m.
Joining of Dissimilar Materials by the Cold Spray Process: Mr. Victor Kenneth Champagne III1, Dr. Michael K. West1, Mr. Todd Curtis2 and Mr. M. Reza Rokni2, 1Mechanical Engineering, University of Massachusetts, Dudley, MA, 2South Dakota School of Mines and Technology, Rapid City, SD

8:00 a.m.–10:00 a.m.
Meeting Room: 101A

Session Chairs:
Dr. Atin Sharma
Oerlikon Metco (US) Inc.
Westbury, NY USA

8:00 a.m.
3-Dimensional Electrode Coatings Produced by Cold Spraying Process for Hydrogen Evolution: Ms. Maniya Aghasibeig, Dr. Rolf Wuthrich, Prof. Christian Moreau and Prof. Ali dolatabadi, Mechanical and Industrial Engineering, Concordia University, Montreal, QC, Canada

8:20 a.m.
A Method for Mechanical Characterization of Cold Spray Sputter Targets in PV Manufacturing: Dr. Johannes Vlcek, Dr. Kedar Hardikar and Dr. Daniel R. Juliano, MiaSolé, a company of Hanergy, Santa Clara, CA

8:40 a.m.
Enhancing Plasma Sprayed LSCF Cathode Performance by Infiltration Method: Ms. Ying Li, Prof. Cheng-Xin Li, Dr. Shan-Lin Zhang, Prof. Guan-Jun Yang and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

9:00 a.m.
High Performance MoN Electrode Deposited By SPPS: Mr. Yakov Gazman1, Mr. Kevin Cole1, Mr. Jean-Michel Gariepy2 and Prof. Thomas W. Coyle2,
1Material Science and Engineering, University of Toronto, Toronto, ON, Canada, 2Centre for Advanced Coating Technologies (CACT), University of Toronto, Toronto, ON, Canada

9:20 a.m.
Plasma Spray-Physical Vapor Deposition of La1-xSrxCoyFe1-yO3-δ Oxygen Transport Membranes on Porous Metallic Supports: Controlling Stress State and Phase Composition: Dr. Diana A Marcano1, Dr. Georg Mauer1, Dr. Yoo J. Sohn1, Prof. Robert Vaßen1, Mr. Julio G. Fayos1 and Dr. Jose M. Serra2, 1Institut für Energie- und Klimaforschung IEK-1, Forschungszentrum Jülich GmbH, Jülich, Germany, 2Universidad Politecnica, Valencia, Spain

9:40 a.m.
The Microstructure Stability of Atmospheric Plasma Sprayed (Mn,Co)3O4 Coating Under H2 and Air Environment: Dr. Ying-Zhen Hu, Prof. Cheng-Xin Li, Dr. Shan-Lin Zhang, Prof. Guan-Jun Yang, Xiao-Tao Luo and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

10:00 a.m.–11:00 a.m.
- Refreshment Break and Poster Session • Exhibit Halls A&B •

8:00 a.m.
Additive Manufacturing using Kinetic Metallization™: Dr. Ralph Tapthorn, Mr. Howard Gabel and Mr. Kyle Burriesci, Inovati, Santa Barbara, CA
8:20 a.m.  
Hierarchical Nanocomposite Coatings for Component Life Extension: Mr. Andrew J. Sherman, Dr. Evelina Vogli and Mr. gabriel Santillan, Mesocoat Inc., Euclid, OH

8:40 a.m.  
Manufacturing of Thick, Crack-Free Wear Protective Coatings on Complex Geometries for Gas Turbine Parts: Dr. Thomas Duda and Mr. Marcus Riedel, Alstom (Switzerland), Birr, Switzerland

9:00 a.m.  
The Effect of Heat Treatment on Mechanical Properties of Thermally Sprayed Sandwich Structure Beams: Mr. Saeid Salavati¹, Dr. Larry Pershin², Prof. Thomas W. Coyle³ and Prof. Javad Mostaghimi¹, ¹Centre for Advanced Coating Technologies (CACT), University of Toronto, Toronto, ON, Canada, ²University of Toronto, Toronto, ON, Canada

9:20 a.m.  
Investigation of the Deposition Mechanism of Cold Spray onto Carbon Fibre Reinforced Polymers: Mr. Hanqing Che¹, Prof. Stephen Yue¹ and Dr. Phuong Vo³, ¹Materials Engineering, McGill University, Montreal, QC, Canada, ²Mining and Materials Engineering, McGill University, Montreal, QC, Canada, ³National Research Council Canada, Boucherville, QC, Canada

9:40 a.m.  
The Phase Structure of High Purity Rare Earth Oxide Coatings Used for Anti-Plasma Erosion: Ms. Xiaojuan Ji, Mr. Yueguang Yu, Wei’ao Hou and Xianjing Ren, Beijing General Research Institute of Mingning & Metallurgy (BGRIMM), Beijing, China

8:20 a.m.  
Effect of Blasting and Spraying Parameters on the Adhesion of Arc Wire Sprayed Aluminium Coatings: Dr. Shiladitya Paul¹, Mr. P J Aldhous¹ and Mrs. H L de Villiers Lovelock², ¹Materials Group, TWI, Cambridge, United Kingdom, ²Surface Engineering, TWI, Cambridge, United Kingdom

8:40 a.m.  
The Importance of Temperature Management in Thermal Spraying and the Respective Advantages of CO2: Mr. Werner Krommer, R&D, Linde AG, Unterschleissheim, Germany

9:00 a.m.  
Influence of Process Parameter on Grit Blasting as a Pretreatment Process for Thermal Spraying: Prof. Kirsten Bobzin, Mr. Thomas Frederik Linke and Mr. Xifang Liao, Surface Engineering Institute, RWTH Aachen University, Aachen, Germany

9:20 a.m.  
Mechanisation of the Grit Blasting Process for Thermal Spray Coating Applications: Dr. Henry Begg¹, Dr. Melissa Riley¹ and Ms. H L de Villiers Lovelock², ¹Surface Engineering, TWI Ltd, Cambridge, United Kingdom, ²TWI Ltd, Cambridge, United Kingdom

10:00 a.m. - 11:00 a.m.  
• Refreshment Break and Poster Session • Exhibit Halls A&B •

Poster Session  
10:00 a.m. - 11:00 a.m.  
Meeting Room: Exhibit Halls A&B

A Comparison Of Coating Deposition Characteristics Under Different Plasma Jet Conditions: Dr. Jie Mao, Min Liu, Chang-Guang Deng, Prof. Ke-Song Zhou, Kun Yang and Ji-fu Zhang, Institute of New Materials, Guangzhou Research Institute of Non-ferrous Metals, Guangzhou, China

A Feasibility Study on Hybrid Use of Thermal Spray Coating and Ultrasonic Nanocrystal Surface Modification: Dr. Auezhan Amanov¹, Mr. Jun-Hyong Kim², Prof. Young-Sik Pyun³, Mr. Khagendra Tripathi⁴, Prof. Soo-Woon Lee⁵, Mr. Hae-Ryong Lee⁶ and Mr. Taehyung Kim⁷, ¹Institute for Manufacturing System Technology, Sun Moon University, Asan, South Korea, ²Mechanical Engineering, Sun Moon University, Asan, South Korea, ³Research Center for Eco Multi-Functional Nanomaterials Global Research Laboratory, Sun Moon University, Asan, South Korea, ⁴Applied Plasma Business, DAWONSYS, Siheung, South Korea, ⁵Gas Turbine Technology Service Center / Dept. of Engineering, KEPCO Plant Service & Engineering Co. Ltd., Incheon, South Korea
Analysis of FeAl Particles Thermal State in Gas Detonation Spraying: Dr. Cezary Senderowski¹, Prof. Andrzej Panas²,³, Prof. Zbigniew Bojar⁴ and N/A Bartosz Fikus⁵, ¹Department Advanced Materials and Technologies, Military University and Technology, Warsaw, Poland, ²Faculty of Mechatronics and Aeronautics, Military University and Technology, Warsaw, Poland, ³Aeroplanes and Helicopters, The Air Force Institute of Technology, Warsaw, Poland

Bonding Phenomena Studies of Cold Sprayed Coatings at the Interfaces: Prof. K. H. Ko, Mr. J. O. Choi and Dr. H. Lee, Department of Energy Systems Research, Ajou university, Suwon, South Korea

Columnar Structured YSZ Coating Formation by PS-PVD Using Conventional Plasma Spray System Assisted through Droplet Filtering: Dr. Qing-Yu Chen, Prof. Cheng-Xin Li, Prof. Chang-Jiu Li, Xiao-Tao Luo and Prof. Guan-Jun Yang, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

Composition Effects of La2Ce2O7 Thermal Barrier Coatings Against Calcium-Magnesium-Aluminum-Silicate (CMAS) at 1250 °C: Dr. Li-Shuang Wang, Dr. Guang-Rong Li, Prof. Cheng-Xin Li, Dr. Tao Liu, Prof. Guan-Jun Yang and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

Critical Analysis Of Wear Behavior Of H-11 Die Steel Treated Under Deep Cryogenic Treatment Machined By WEDM: Mr. Sandeep Kumar Sharma and Mr. Gurpyar Singh Dhaliwal, MECHANICAL ENGINEERING, GURU KASHI UNIVERSITY, TALWANDI SABO, Batala, India

Development of HVOF-Sprayed Ceramic Coatings: Mr. Peter S. Hollingsworth and Prof. Wolfgang Tillmann, Institute of Materials Engineering, Technische Universität Dortmund, Dortmund, Germany

Effect of Annealing Treatment on the Microstructure and Properties of 316L Stainless Steel Coating Deposited by Low Pressure Plasma Spray: Dr. Deming Yang, Prof. Yang Gao and Dr. Chengqi Sun, Thermal Spraying Center of Dalian Maritime University, Dalian, China

Effect of MCrAlY Bond Coat Surface Temperature on Thermal Cyclic Lifetime of Plasma-Sprayed Thermal Barrier Coatings: Mr. Hui Dong, Prof. Chang-Jiu Li, Mr. Hang Ding, Dr. Xiao-Tao Luo, Prof. Guan-Jun Yang and Prof. Cheng-Xin Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

Effects of Nanoparticles on Liquid Feedstock Behavior in High Velocity Suspension Flame Spray Process: Mr. E Gozali¹,³, Dr. S Kamnis³ and Prof. S Gu¹, ²Xi’an Jiaotong-Liverpool University, Suzhou, China, ³School of Engineering, Liverpool University, Liverpool, United Kingdom, ¼Civil Engineering, Xi’an Jiaotong-Liverpool University, Suzhou, China

Effect of Substrate Temperature on the Cold-sprayed 316L Stainless Steel Coatings: Mr. Ying-Chun Xie¹, Ms. Marie-Pierre PLANCHE¹, Dr. Xinkun Suo¹, Prof. PHILIPPE herve², Mr. Rija RADELISON³ and Prof. H. Liao⁴, ¹LERMPS, University of Technology of Belfort-Montbéliard, Belfort, France, ²Université Paris X, paris, France

Effect of TGO Thickness On Isothermal Cyclic Lifet ime of Plasma-Sprayed YSZ thermal barrier coatings: Mr. Hang Ding, Mr. Hui Dong, Prof. Chang-Jiu Li and Prof. Guan-Jun Yang, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

Examination of the Thermal Stability of Plasma-Sprayed La2Ce2O7/YSZ Composite Coating: Dr. Ya-Xin Xu, Dr. Tao Liu and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

Fabrication of Ti-Al Intermetallic Compound Coatings by Cold Spraying: Dr. Hong-Tao Wang¹, Mrs. Ru-Yu Wang², Dr. Xiao Chen³, Xiao-Bo Bai⁴ and Prof. Gang-Chang Ji³, ¹School of mechanical and material engineering, jiujiang university, jiujiang, China, ²Jiujiang University, Jiujiang, China, ³School of mechanical and material engineering, Jiujiang University, Jiujiang, China, ⁴School of mechanical & Materials Engineering, Jiujiang University, Jiujiang, China

Failure Mechanism for Flexible Dye-sensitized Solar Cells Under Repeated Bending: Mr. Xue-Long He, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

High Corrosion Resistance of Electrodeposited Ni-Graphene Nanocomposite Coating: Mr. Seyed Ali Hosseini Khorasani and Dr. Sohrab Sanjabi, Tarbiat Modares University, Tehran, Iran
TECHNICAL PROGRAM • WEDNESDAY, MAY 13, 2015

High Temperature Oxidation Resistance Of Surface/Coating NiCr/Al Composite Coatings: Dr. Nannan ZHANG, Mr. Danyang LIN, Ms. Yue ZHANG and Prof. Deyuan Li, Department of Materials Science and Engineering, Shenyang University of Technology, Shenyang, China

High Thermal Conductivity Plasma Sprayed AlN Coating: Dr. Mohammed shahien1,2, Dr. Motohiro Yamada1, Prof. Masahiro Fukumoto1, Kazumi Egota1 and Kenji Okamoto1, 1Toyohashi University of Technology, Toyohashi, Japan, 2Central Metallurgical Research and Development Institute, CMRDI, Cairo, Egypt, 3Fuji Electric Co., Ltd., Hino, Japan

Hot Corrosion Resistant Cermet Coatings For Marine Diesel Engines: Dr. Francesco Marra1,2, Dr. Giovanni Pulci3, Lidia Baiamonti1,2, Stefano Gazzola1, Patrizio Giovanetto1, Prof. Cecilia Bartuli2,3 and Prof. Teodoro Valente1,2,3, 1Chemical Engineering Materials Environment, Sapienza—University of Rome, Rome, Italy, 2INSTM—National Interuniversity Consortium of Materials Science and Technology, Florence, Italy, 3Zanzi, Ivrea, Italy

Hydroxyapatite Powders for Plasma Spray Coating of Implantable Devices: Mr. Richard Vandeventer, Medical Group, Corp., Vaulx en Velin, France; Medical Group USA, Atlanta, GA

Influence of Element Evaporation on the Composition of La2Ce2O7 Splats Deposited by Plasma Spraying: Mrs. Li-Shuang Wang, Dr. Tao Liu, Prof. Guan-Jun Yang, Prof. Chang-Jiu Li and Prof. Cheng-Xin Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

Influence of the Increased Atomizing Gas Pressure on Microstructure and Mechanical Properties of Arc Sprayed Coatings: Prof. Vasyl Pokhmruskii1, Dr. Hanna Pokhmurska2,3, Dr. Thomas Lampke1, Dr. Mykhailo Student1, Dr. Volodymyr Gvozdecky1 and Mr. Taras Stupnytskyy1, 1G.V. Karpenko Physico-Mechanical Institute of the National Academy of Sciences of Ukraine, Lviv, Ukraine, 2Institute of Materials Science and Engineering, Chemnitz University of Technology, Chemnitz, Germany, 3Institute of Materials Science and Engineering, Technische Universitaet Chemnitz, Chemnitz, Germany

Investigation of Cold-Sprayed WC-Fe Alloys Coating Formation and Properties: Dr. Hong-Tao Wang1, Mrs. Ruoyu Wang2, Dr. Xiao Chen1, Mr. Xiao-Bo Bai1 and Prof. Gang-Chang Ji1, 1School of mechanical and material engineering, jiujiang university, jiujiang, China, 2Jiujiang University, Jiujiang, China, 3School of mechanical and material engineering, Jiujiang University, Jiujiang, China, 4School of Mechanical & Materials Engineering, Jiujiang University, Jiujiang, China

Investigation of Oxidation Behavior and Evolution of Grain Morphology of Fe-Cr-Al alloy at 1200°C and 1300°C: Ms. Yan Zhao and Prof. Yang Gao, Thermal Spraying Center of Dalian Maritime University, Dalian, China

Isothermal Oxidation Behaviour of Thermally Sprayed Nickel Foam Structure: Dr. Yugeshwar Subramaniam, Prof. Thomas W. Coyle, Dr. Larry Pershin and Prof. Javad Mostaghimi, Centre for Advanced Coating Technologies (CACT), University of Toronto, Toronto, ON, Canada

LEBM and CRYO Milling Composite Powder Production: Mr. Marco Robotti, Dr. Sergi Dosta1, Dr. I. G. Cano1, Dr. Nuria Cinca1, Dr. Amadeu concustell1 and Prof. Josep M. Guilemany1,1 Dept. de Ciencia dels Materials i Enginyeria Metal·lúrgica, Thermal Spray Centre (CPT)—Universitat de Barcelona, Barcelona, Spain, 2Thermal Spray Center, University of Barcelona, Barcelona, Spain

Manufacturing of Porous-Structured Ti6Al4V Alloy by Selective Laser Melting: surface roughness, mechanical properties and corrosion resistance: Dr. Bo Song, Dr. Shujuan Dong, Prof. Hanlin Liao and Prof. Christian Coddet, IRITES-LERMPJ, Université de Technologie de Belfort-Montbéliard, Belfort, France

Microstructure and Post-Treatment of CuGa Target by Cold Spray: Dr. Hyung Jun Kim1, Prof. Keeahn Lee1 and Mr. Dong-yong Park1,1 RIST, Pohang, South Korea, 2Department of Advanced Materials Engineering, Andong National University, Andong, South Korea, 3Taekwang Tech., Kyungjoo, South Korea

Microstructure, Thermal Behavior and Mechanical Properties of Mo Coatings Deposited by Plasma Spraying and Dry-Ice Blasting: Dr. Shujuan Dong, Dr. Bo Song, Prof. Hanlin Liao and Prof. Christian Coddet, IRITES-LERMPJ, Université de Technologie de Belfort-Montbéliard, Belfort, France

Micro-Joints Formation during D-Gun Spraying: Prof. Waldemar Wolczynski1, Dr. Cezary Sendorowski1,2, Prof. Jerzy Morgiel2 and Dr. Grzegorz Garzel1,1 The Institute of Metallurgy and Materials Science, Polish Academy of Sciences, Krakow, Kraków, Poland, 2Department Advanced Materials and Technologies, Military University and Technology, Warsaw, Poland, 3Institute of Metallurgy and Materials Science, Polish Academy of Sciences, Krakow, Poland

Microstructure and Mechanical Properties of YSZ coatings via Gas and Droplet Co-deposition by PS-PVD: Dr. Qing-Yu Chen, Prof. Cheng-Xin Li, Prof. Guan-Jun Yang, Xiao-Tao Luo and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China
New Improvements of Diagnostic Method PSI III (Particle Shape Imaging) for Determination of Particle Behavior: Dr. Stephan Zimmermann, Dr. Guenter Forster, Prof. Klaus Landes and Prof. Jothen Schein, Lab for Plasma Technology (LPT), EIT 1, Universitaet der Bundeswehr Muenchen, Neubiberg, Germany

Novel Technique of Surface Preparation for Thermally Sprayed Coatings Using Modified D-gun: Prof. Boris Khamitsev, Dr. Lev Baldaev, Mr. Sergey Baldaev, Ms. Alsu Ahmetgareeva, Mr. Alexander Aleksandrovy, Ms. Renata Ismagilova and Prof. Tamara Gavrilenko, TSPC, Ltd., Sherbinka, Russia, TSPC, Ltd., Moscow, Russia, STC Detonation, Ltd., Novosibirsk, Russia

Numerical Study of the Arc Fluctuations in DC Plasma Torch: Mr. Esmaeil Safaei Ardakani and Prof. Javad Mostaghimi, University of Toronto, Department of Mechanical Engineering, Toronto, ON, Canada, Mechanical and Industrial Engineering, University of Toronto, Toronto, ON, Canada

Optimization of Remelting Process of Piston Aluminum Alloy Through TiG: Dr. Peihu Gao, Prof. Jianping Li, Mr. Yongxin Wu, Mr. Jilin Liu, Mrs. Zhiling Yang and Mr. Hongyan Li, School of Materials and Chemical Engineering, Xi’an Technological University, Xi’an, China, PLA Representative Office in Factory No.616, Datong, China, Foundry of North General Power Group Co., Ltd, Datong, China

Preparation and Characterization of Super-Hydrophobicity Silica Coating by HVOF: Dr. Jie Li, Prof. Cheng-Xin Li, Ms. Yu Zhang, Prof. Xi-De Pan, Prof. Guan-Jun Yang, Xiao-Tao Luo and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

Research on Establishment of Process Parameters and Technology Working Electric Arc Thermal Spraying of Composite Materials: Dr. Antoniu Alexandru Cernaianu, COREF SRL, Bucharest, Romania

Residual Stresses Analysis of Cold Sprayed Coatings by Numerical Simulation: Prof. Wenya Li, Dr. Kang Yang, Mr. Dongdong Zhang and Mr. Tao Liu, School of Materials Science and Engineering, Northwestern Polytechnical University, Xi’an, China, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

Scuffing Resistance of HVOF Sprayed Nanostructured Carbide Coatings: Dr. Wojciech Zorawski and Dr. Merard Makrenk, The Centre for Laser Technologies of Metals, Kielce University of Technology, Kielce, Poland, Faculty of Management and Computer Modelling, Kielce University of Technology, Kielce, Poland

Shot Peening Effect on the Morphology and Roughness of HVOF coatings: Mr. Gustavo Baresco Sucharski, Dr. Anderson Geraldo Marenda Pukasiewicz, Mr. Rodolpho Fernando Vaz and Dr. Ramón Sigifredo Cortez Paredes, Mechanical Department, Universidade Federal do Paraná, Curitiba, Brazil, Mechanical Engineering, UTFPR—Ponta Grossa, Ponta Grossa, Brazil, Mechanical Engineering, LACTEC Institute of Technology for Development, Curitiba, Brazil

Solution Precursor Plasma Spraying of Bismuth Titanate by Means of Inductively-Coupled Thermal Plasma: Baptiste Le Roux and Prof. Jocelyn Veilleux, Chemical Engineering, Université de Sherbrooke, Sherbrooke, QC, Canada

Substrate Template Effect on the Microstructure of Plasma-sprayed Ceramic Splats: Mr. Shu-Wei Yao, Ms. Er-Juan Yang, Prof. Chang-Jiu Li, Dr. Xiao-Tao Luo, Prof. Guan-Jun Yang and Prof. Cheng-Xin Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

Synthesis of LaAlO3 Doped with Eu through the Citrate Precursor Method Modified by Spray Dryer: Mr. Alfredo Morales-Hernández, Dr. Juan Zarate-Medina, Dr. Teodor Rivera-Montalvo and Dr. Maria Eugenia Contreras-García, Instituto de Investigaciones Metalúrgicas de la Universidad Michoacana de San Nicolás de Hidalgo, Edif. “U”, Morelia, Mexico, Centro de Investigación en Ciencia Aplicada y Tecnología Avanzada-Legaria, México D.F., Mexico

TGO Formation and Failure Mode of TBC Systems Comprising PVD-Al Interlayers: Mr. Ibrahim Ali, Dr. Thomas Grund, Prof. Thomas Lampke, Dr. Daniel Wett, Dr. Daisy Nestler and Prof. Guntram Wagner, Institute of Materials Science and Engineering, Technische Universitaet Chemnitz, Chemnitz, Germany

The Corrosion Behavior of Thermal Spray Coating on 304L Stainless Steel in a Saline Environment: Mr. Tung-Yuan YUNG, Mr. Tai-Cheng Chen, Dr. Kun-Chao Tsai, Dr. Jiunn-Yuan Huang and Dr. Charn-Ying Chen, Institute of Nuclear Energy Research, Taoyuan, Taiwan

The Influence of Spraying Parameters on Microstructure Characterization of Thermally Sprayed Abradable Coatings: Dr. Lev Baldaev, Mr. Sergey Baldaev, Ms. Alsu Ahmetgareeva, Mr. Andrey Berezovsky, Ms. Renata Ismagilova and Mr. Anton Zhukov, TSPC, Ltd., Sherbinka, Russia, TSPC, Ltd., Moscow, Russia
9:40 a.m.
The Influence of Spraying Parameters on Tribological Characterization of Thermally Sprayed Anti-friction Coatings for Aircraft Bearings: Ms. Renata Ismagilova¹, Dr. Lev Baldaev², Mr. Sergey Baldaev³, Ms. Alsu Ahmetgareeva⁴ and Prof. Boris Khamitsev⁵, ¹TSPC, Ltd., Sherbinka, Russia, ²TSPC Ltd., Moscow, Russia, ³TSPC, Ltd., Moscow, Russia

Thermo-Mechanical Properties of Thermal Barrier Coatings with Single and Layer Structure: Mr. Qi-Zheng Cui¹, Dr. Sang-Won Myoung¹, Mr. Zhe Lu¹, Prof. Yeon-Gil Jung¹ and Ungyu Paik⁶, ¹School of Materials Science and Engineering, Changwon National University, Changwon, South Korea, ²Department of Energy Engineering, Hanyang University, Seoul, South Korea

Thermo-physical Properties of Multiphase Fe-Al Intermetallic Coating with the Oxide Ceramics Created insitu During Gas Detonation Process: Dr. Cezary Senderowski⁷, Prof. Andrzej Jaroslaw Panas⁸, N/A Bartosz Fikus⁹, Prof. Zbigniew Bojar¹ and Prof. Waldemar Wolczyński¹, ¹Department Advanced Materials and Technologies, Military University and Technology, Warsaw, Poland, ²Faculty of Mechatronics and Aeronautics, Military University and Technology, Warsaw, Poland, ³Aeroplanes and Helicopters, Air Force Institute of Technology, Warsaw, Poland, ⁴The Institute of Metallurgy and Materials Science, Polish Academy of Sciences, Krakow, Kraków, Poland

Trajectory and Precipitation of Precursor Droplets in a RF Inductively Coupled Plasma: Ms. Zhuolin Song and Prof. Yanguang Shan, School of Energy and Power Engineering, University of Shanghai for Science and Technology, Shanghai, China

Wear Analysis of NiCrAl-Bentonite Thermal Sprayed Coating With The Experimental Design Method: Dr. Abdelmadjid AIT YALA, Mechanical Engineering, University of BOUIRA, BOUIRA, Algeria

Wear and Friction Analysis of Plasma Sprayed Cr3C2-NiCr Coating: Mr. Jasmeet Singh¹ and Dr. Manpreet Kaur², ¹mechanical engineering, Baba Banda Singh Bahadur Engineering College, Fatehgarh Sahib., fatehgarh sahib, India, ²baba banda singh bahadur engineering college fatehgarh sahib, fatehgarh sahib, India

11:00 a.m.
The Effects of Post Cold Spray Heat Treatments on Microstructure & Mechanical Properties of 7075 Al Depositions: Mr. M. Reza Rokni¹, Dr. Christian A. Widener¹, Dr. Grant A. Crawford¹ and Mr. Victor K. Champagne², ¹South Dakota School of Mines and Technology, Rapid City, SD, ²ARL Center for Cold Spray, US Army research laboratory, Aberdeen, MD

11:05 a.m.
Development of Innovative Iron Alloy Thermal Barrier Coatings for Low Temperature Applications: Prof. Kirsten Bobzin, Mr. Thomas Frederik Linke, Mr. Mehmet Öte and Mr. Tim Königstein, Surface Engineering Institute, RWTH Aachen University, Aachen, Germany

11:10 a.m.
Durability Strategies for Plasma Sprayed Thermal Barrier Coatings via Layered Engineering: Mr. Vaishak Viswanathan¹, Dr. Gopal Dwivedi¹ and Prof. Sanjay Sampath¹, ¹Center for Thermal Spray Research, Stony Brook University, Stony Brook, NY, ²Materials Science and Engineering Department, Center for Thermal Spray Research, State University of New York at Stony Brook, Stony Brook, NY

11:15 a.m.
LECs—Light Emitting Coatings: Mr. Michael Lehmann, Dr. Fabian Trenkle and Mr. Sven Hartmann, obz innovation gmbh, Bad Krozingen, Germany

11:20 a.m.
Modeling the Solidification Microstructure and Mechanical Response of WC-Co coatings: Mr. Tatu Pinomaa¹, Mr. Tom Andersson¹, Mr. Anssi Laukkanen¹, Mr. Tomi Suhonen¹, Dr. Sebastian Gurevich¹ and Prof. Nikolas Provatas², ¹VTT Technical Research Centre of Finland, Espoo, Finland, ²McGill University, Montreal, QC, Canada
11:25 a.m.
Correlation of In-Situ Curvature Measurement and Hole-Drilling Method for Evaluation of Stress States in Thermally Sprayed Coatings: Mr. Markus Mutter1, Dr. R. Mücke1, Dr. Georg Mauer2, Prof. Robert Vaßen3, Mr. Hyong Chul Back2 and Dr. Jens Giebmeier2,
1Institut für Energie- und Klimaforschung IEK-1, Forschungszentrum Jülich GmbH, Jülich, Germany, 2Institut für Angewandte Materialien IAM-WK, Karlsruhe Institute of Technology, Karlsruhe, Germany

11:30 a.m.
The Impact Behavior Alteration Depending on the Process Conditions in Kinetic Spraying of Al2O3 Particles: Prof. Changhee Lee, Mr. Jaeick Kim, Mr. Gyeongjun Byun and Mr. Hyungkwon Park, Division of Materials Science and Engineering, Hanyang University, Seoul, South Korea

11:35 a.m.
Biocompatible Porous Coating by Under-Critical Cold Spray: Mrs. Atieh Moridi1, Dr. Seyyed Mostafa Hassani-Gangaraj1,2, Prof. Hamid Assadi3, Mr. Frank Gartner3, Prof. T. Klassen3 and Prof. Mario Guagliano3, 1Mechanical engineering department, Politecnico di Milano, Milano, Italy, 2Materials science and engineering department, Massachusetts Institute of Technology, Cambridge, MA, 3Department of Mechanical Engineering, Helmut Schmidt University, University of the Federal Armed Forces Hamburg, Hamburg, Germany

11:40 a.m.
Influence of Microstructure on Thermal Properties of Columnar Axial Suspension Plasma Sprayed Thermal Barrier Coatings: Mr. Ashish Ganvir, Production Technology, University West, Trollhattan, Sweden, Trollhattan, Sweden

11:45 a.m.
3-Dimensional Electrode Coatings Produced by Cold Spraying Process for Hydrogen Evolution: Ms. Maniya Aghasibeig, Prof. Ali Dolatabadi, Dr. Rolf Wuthrich and Prof. Christian Moreau, Mechanical and Industrial Engineering, Concordia University, Montreal, QC, Canada

11:50 a.m.
Development of High Sintering-Resistant Thermal Barrier Coating Based on the Bridging Behavior of Inter-Lamellar Pores during Thermal Exposure: Mr. Tao Liu and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

11:55 a.m.
Pronounced Strain Relief Due to Defect Annealing in Thermal Spray Coatings: Mrs. Miryan Lorena Bejarano1,2, Dr. Alfredo Valarezo3, Mr. Mario Caldon1, Prof. Sanjay Sampath1 and Dr. Edgar Lara-Curzio1, 1Materials Science and Engineering Department, Center for Thermal Spray Research, Stony Brook, NY, 2Mechanical Engineering, Universidad San Francisco de Quito, Quito, Ecuador, 3Materials Science & Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, Oak Ridge, TN

12:00 p.m. - 1:00 p.m.
Lunch On Own

1:00 p.m.
Cold Spray Deposition of Mechanically Alloyed Nanostructured Cu-Ni-Fe Powders: Dr. Manuel H. Martin1, Dr. Dominique Poirier2, Dr. Jean-Gabriel Legoux3, Dr. Eric Irisson4, Dr. G. Goupil4, Dr. D. Guay4 and Dr. L. Roué4, 1National Research Council of Canada, Boucherville, QC, Canada, 2National Research Institute of Canada, Boucherville, QC, Canada, 3National Research Council Canada, Boucherville, QC, Canada, 4Institut National de la Recherche Scientifique (INRS), Varennes, QC, Canada

1:20 p.m.
Cu-MoS2 Composite Coatings Fabricated by Cold Spray and Their Tribological Performances: Ms. Yinyin Zhang1, Dr. Sylvie V. Descartes2, Edouard Regis3, Dr. Phuong vo1 and Prof. Richard R. Chromik1, 1Mining and Materials Engineering, McGill University, 3610 University Street, Montreal, Canada QC H3A 0C5, Montreal, QC, Canada, 2INSA de Lyon, Lyon, France, 3INSA-Lyon, Lyon, France, 4National Research Council Canada, Boucherville, QC, Canada

1:40 p.m.
Investigation of Oblique Incidence in Cold Spraying Cu/Cu by the minimal Average Bonding Strength to Suppress Rebounding: Mr. Kai Wang, Dr. Lingyan Kong, Dr. Y.S Tao, Prof. Tiefan Li and Prof. Tianying Xiong, DIVISION OF SURFACE ENGINEERING, Institute of metal research, CAS, Shenyang, China
2:00 p.m.
Elastic Isotropy of Cold Sprayed Coatings: Dr. Jan CIZEK1, Dr. Hanus SEINER1, Mr. Renzhong HUANG2, Dr. Michal LANDA2 and Prof. Ivo DLOUHY3, 1Institute of Materials Science and Engineering, Netme Centre, Brno University of Technology, Brno, Czech Republic, 2Department of Ultrasonic Methods, Institute of Thermomechanics, Czech Academy of Sciences, Prague, Czech Republic, 3R&D department, Plasma Giken Co., Ltd., Saitama, Japan

2:20 p.m.
Study on Cu-Ag-Zn Abradable Seal Coatings by Cold Spraying: Dr. XINYU CUI, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China

2:40 p.m.
Effect of Alloying Active Elements of Powder on Spreading Behaviour of Plasma Spray Splats: Mr. Yonggang Zhang1, Prof. Margaret Hyland1, Dr. Anh Thi Tuyet Tran2 and Dr. Steven Matthews2, 1Department of Chemical and Materials, the University of Auckland, Auckland, New Zealand, 2School of Advanced Engineering and Technology, Massey University, Auckland, New Zealand

3:00 p.m.--3:30 p.m.
- Refreshment Break - Exhibit Halls A&B -

3:30 p.m.
Splat Formation of Copper and Copper Alloy on Ceramic Substrate in Plasma Spray Process: Dr. Anh T.T Tran1, Prof. Margaret Hyland1, Prof. Masahiro Fukumoto1 and Prof. Paul Munroe3, 1Department of Chemical and Materials, the University of Auckland, Auckland, New Zealand, 2Toyoashi University of Technology, Toyohashi, Japan, 3School of Materials Science and Engineering, The University of New South Wales, Sydney, Australia

3:50 p.m.
Understanding the Formation of Limited Inter-Lamellar Bonding in Thermal Sprayed Ceramic Coating: Mr. Shu-Wei Yao, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li, Dr. Xiao-Tao Luo and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

1:00 p.m.
Optimizing Cavitation Resistance—An Approach By Cold Spraying Of Several Bronze Materials: Mr. Sebastian Krebs, Dr. Frank Gärtnert and Prof. Thomas Klassen, Department of Mechanical Engineering, Helmut Schmidt University, University of the Federal Armed Forces Hamburg, Hamburg, Germany

1:20 p.m.
Surface Morphology Investigations of Suspension Plasma Sprayed Zirconia Coatings: Dr. Nicolaie Markocsan, Prof. Per Nylen and Mrs. laetitia keirsse, Production Engineering, University West, Trollhättan, Sweden

1:40 p.m.
Wear Behaviour of Conventional and Nano-structured Thin Films of Titanium Aluminium Nitride: Prof. Jasmaninder Singh Grewal1, Dr. Buta Singh Sidhu1 and Dr. satya prakash3, 1Production Engineering, Guru Nanak Dev Engineering College, Ludhiana, Punjab, India—141 006,, Ludhiana, India, 2Academics, Punjab Technical University, Kapurthala, Punjab, India, 3Department of Metallurgical and Materials Engineering,, Indian Institute of Technology, Roorkee, India

2:00 p.m.
Tribological Behaviour of the Bare and Thermal sprayed Hot Forming Tool Steels: Dr. Manpreet Kaur and Mr. Nipun Sharma, Mechanical, Baba Banda Singh Bahadur Engineering College, Fatehgarh Sahib, Punjab, India, Fatehgarh Sahib, India

2:20 p.m.
Cold Spray Serial Production Applications and Application Development with Focus on Cold Spraying at OBZ Innovation GMBH: Dr. Fabian Trenkle, Ms. Johanna Schmidt, Mr. Michael Lehmann, Mr. Mateusz Cichosz, Mr. Ingo Dresel and Mr. Sven Hartmann, obz innovation gmbh, Bad Krozingen, Germany
2:40 p.m.  
Comparative Study of the Erosive Wear of Thermally Sprayed Coatings Using Powder and Flexicord Feedstock Materials: Prof. Carlos R. C. Lima¹, Prof. Rodolfo Libardi¹, Ms. Miguel A. R. Mojena², Prof. Hipólitó C Fals³, Ms. Claudenete V. Leal⁴ and Mr. Flávio Camargo⁵, ¹College of Engineering, UNIMEP—Methodist University of Piracicaba, Santa Bárbara d’Oeste, Brazil, ²Mechanical Engineering, Oriente University, Santiago de Cuba, Cuba, ³Mechanical Engineering, Universidad de Oriente, Santiago de Cuba, Cuba, ⁴State University of Campinas—UNICAMP, Campinas, Brazil, ⁵GRAMAC Surface Engineering, Santo Antônio de Posse, Brazil

3:00 p.m.–3:30 p.m.  
• Refreshment Break • Exhibit Halls A&B •

3:30 p.m.  
Effects of Powder Characteristics and High Velocity Flame Spray Processes on Hardmetal Coatings: Part 1—Cr₃C₂-NiCr-Coatings: Mr. Richard Trache¹², Dr. Lutz-Michael Berger¹, Mr. Sven Thiele¹, Dr. Filofteia-Laura Toma¹, Prof. Alexander Michaelis¹ and Prof. Christoph Leyens², ¹Fraunhofer IWS, Dresden, Germany, ²IFWW, Technische Universität Dresden, Dresden, Germany, ³Fraunhofer IKTS, Dresden, Germany, ⁴Technische Universität Dresden, Dresden, Germany

3:50 p.m.  
Effects of Powder Characteristics and High Velocity Flame Spray Processes on Hardmetal Coatings: Part 2—Cr₃C₂-WC-Based Coatings: Dr. Lutz-Michael Berger¹, Mr. Sven Thiele¹, Mr. Richard Trache¹² and Dr. Filofteia-Laura Toma¹, ¹Fraunhofer IKTS, Dresden, Germany, ²IFWW, Technische Universität Dresden, Dresden, Germany, ³Fraunhofer IWS, Dresden, Germany

4:10 p.m.  
Novel Suspension Plasma Sprayed Superhydrophobic Coatings And Investigating Their Durability For Anti-Icing Application: Mr. Navid Sharifi, Prof. Martin Pugh, Prof. Christian Moreau and Prof. Ali Dolatabadi, Mechanical and Industrial Engineering, Concordia University, Montreal, QC, Canada

4:30 p.m.  
On the Formation and Properties of Thermal Sprayed Al₂O₃ Coatings: Mr. Tomi Suhonen¹, Tommi Varis¹, Mr. Jarkko Metsäjoki¹, N/A Ulla Kanerva¹, Ms. Minna Nittymäki¹ and Dr. Kari Lahti¹, ¹Thermal Spray, VTT Technical Research Centre of Finland, Espoo, Finland, ²VTT Technical Research Centre of Finland, Espoo, Finland, ³Electrical Engineering, Tampere University of Technology, Tampere, Finland

4:30 p.m.  
• 1:00 p.m.–4:30 p.m.  
Meeting Room: 101A

Energy 4
1:00 p.m.–4:30 p.m.  
Meeting Room: 101A

Session Chairs:  
Dr. Atin Sharma  
Oerlikon Metco (US) Inc.  
Westbury, NY USA  
Mr. Lars Östergren  
GKN Aerospace  
Trollhättan, Sweden

1:00 p.m.  
Solid Particle Erosion Characteristics of HVOF Cermet Coating and Multiple-carbide Hardface Overlay: Mr. Pardeep Kumar¹ and Dr. Buta Singh Sidhu², ¹Mechanical Engineering, Yadavindra College of Engineering, Punjabi University G.K. Campus, Talwandi Sabo, Punjab, India, ²Academics, Punjabi Technical University, Kapurthala, Punjab, India

1:20 p.m.  
Multi-scale Structured Composite Coatings by Plasma Transferred Arc for Nuclear applications: Mr. Arnaud Werry¹, Dr. Christophe Chazelas², Dr. Alain Denoirjean¹, Erick Meillo³, Dr. Stephane Valette¹ and Prof. Armelle Vardelle¹, ¹UMR CNRS 6638, University of Limoges, Limoges, France, ²European Ceramic Center, University of Limoges, Limoges, France, ³DAM, CEA, Monts, France

1:40 p.m.  
Fireside Corrosion Performance of NiCr Coatings in Simulated Coal-biomass Combustion Environment: Dr. Tanvir Hussain¹, Dr. N.J. Simms² and Prof. John R. Nicholls³, ¹Division of Materials, Mechanics and Structures, University of Nottingham, Nottingham, United Kingdom, ²School of Applied Sciences, Cranfield University, Cranfield, United Kingdom, ³Materials Department, Cranfield University, Cranfield, United Kingdom

2:00 p.m.  
Microstructure and Thermoelectric Properties of Low-Pressure Plasma-Sprayed FeSi₂ Coatings: Ms. XIAOHUA FENG¹, Prof. Hanlin Liao² and Ms. Marie-Pierre PLANCHE³, ¹IRTES-LERMP, University of technology Belfort-Montbéliard, SEVANANS, France, ²IRTES-LERMP, Université de Technologie de Belfort-Montbéliard, Belfort, France, ³IRTES-LERMP, UTBM, Sevenans, France
2:20 p.m.  
Microstructure and Thermal Conductivity of Fe-Based Coatings Prepared by Wire-Arc Spraying:  
Dr. Haihua YAO, Dr. Zheng Zhou and Prof. Dingyong He, College of Materials Science & Engineering, Beijing University of Technology, Beijing, China

2:40 p.m.  
Use of Flame-Sprayed Coatings in Anti-Icing Systems for Airfoil Structures:  
Mr. Adrián Lopera-Valle and Dr. André McDonald, Mechanical Engineering, University of Alberta, Edmonton, AB, Canada

3:00 p.m.–3:30 p.m.  
• Refreshment Break • Exhibit Halls A&B

3:30 p.m.  
In-situ Sensors Deposited by Laser Cladding:  
Ms. Yanli Zhang1, Dr. D.E. Mack1, Dr. Georg Mauer2, Prof. Robert Vaßen2 and Prof. Olivier Guillou2, Institute of Energy and Climate Research (IEK-1), Forschungszentrum Jülich GmbH, Jülich, Germany

3:50 p.m.  
Performance Evaluation of Pyramidal Fin Arrays Produced by Additive Manufacturing via Cold Spray on Wire Mesh Compact Heat Exchangers:  
Mr. Yannick Cormier1, Mr. Philippe Dupuis1, Mr. Antoine Corbeil2 and Dr. Bertrand Jodoin1, Mechanical Engineering, University of Ottawa, Ottawa, QC, Canada

4:10 p.m.  
Manufacture of High Efficiency Environmentally Friendly Ceramic Gas Turbine Engines (CGTE) Using 3-D Laser Additive Processes:  
Prof. Anatoly V. Sudarev1, Prof. Vladimir G. Konakov2 and Mrs. Natalia G. Sudareva1, Research Centre “Ceramic Engines” named after A.M. Boyko”, Ltd, Saint-Petersburg, Russia

1:00 p.m.  
Investigation on Plasma Sprayed CoNiCrAlY-BN-Polyester Abradable Coating Consistency using In-flight Particle Diagnostics:  
Dr. Eric Irissou1, Prof. Christian Moreau2 and Dr. Rogerio S. Lima3, National Research Council Canada, Boucherville, QC, Canada

1:20 p.m.  
Microstructure and Properties of porous Abradable Alumina Coatings flame-sprayed by Semi-molten Particles:  
Prof. Chang-Jiu Li, Ms. Jiao Zou, Mr. Hui-Bin Huo, Prof. Cheng-Xin Li, Prof. Guan-Jun Yang and Ms. Jian-Tao Yao, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

1:40 p.m.  
Influence of APS Process Parameters on Morphologies of YSZ-Polyester Abradable Coatings:  
Ms. Delphine Aussavy1, Dr. Rodolphe BOLOT1, Prof. Ghislain Montavon1, Prof. François Peyrout1, Mr. Gregory Szynelman1, Dr. Julien Gurt-Santanach1 and Dr. Serge Seleznoff1, IRITES-LERMPS, University of Technology of Belfort-Montbéliard, Belfort, France

2:00 p.m.  
Application of FEM for the Estimation of Thermo-Mechanical Properties of Plasma Sprayed Composite Coatings:  
Dr. Rodolphe BOLOT1, Ms. Delphine Aussavy2 and Prof. Ghislain montavon1, IRITES-LERMPS, University of Technology of Belfort-Montbéliard, Belfort, France

Engineering TBCs and Abradables  
1:00 p.m.–4:50 p.m.  
Meeting Room: 102B

Session Chairs:  
Mr. Jeff Smith  
Material Processing Technology  
Norton Shores, MI USA

Mr. Yuk-Chiu Lau  
General Electric Global Research  
Niskayuna, NY USA
2:20 p.m.
AFM Study of the Faceting of Ceramic Splats during Thermal Exposure for designing high sintering-resistance TBCs: Dr. Tao Liu, Dr. Xiao-Tao Luo, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

2:40 p.m.
High Efficiency Deposition of the Porous Ceramic Abradable Coating using a High Energy Plasma Torch: Jianming Liu, Mr. Yueguang Yu, Beijing General Research Institute of Mingning & Metallurgy (BGRIMM), Beijing, China

3:00 p.m.–3:30 p.m.
• Refreshment Break • Exhibit Halls A&B •

3:30 p.m.
Formation of a Continuous \( \beta \)-NiAl Layer Near the Interface in a \( \gamma+\beta \) MCrAlY: Dr. Kang Yuan, Prof. Ru Lin Peng and Dr. Xin-Hai Li, Linkoping University, Linkoping, Sweden, Material Technology, Research & Development, Siemens Industrial Turbomachinery AB, Finspong, Sweden

3:50 p.m.
High Temperature Oxidation of Cold Gas Sprayed Bond Coats for TBC Application: Prof. Carlos R. C. Lima, Mr. V. Crespo, Mr. I. G. Cano, Dr. Sergio Dosta, Ms. M.J.X. Belém and Prof. Josep M. Guillemany, College of Engineering, University of Piracicaba, Santa Bárbara d’Oeste, Brazil, Dept. de Ciencia dels Materials i Enginyeria Metal·lúrgica, Thermal Spray Centre (CPT)---Universitat de Barcelona, Barcelona, Spain

4:10 p.m.
A Comparison of the Thermal Properties of ZrO2-Ln2O3 (Ln – Y, La, Nd, Sm, Gd) Thermal Barrier Coatings: Mr. Ivan Mazlin, Dr. Lev Baldaev and Prof. Dmitri Drobot, TSPC Ltd., Moscow, Russia, TSPC, Ltd., Moscow, Russia, Lomonosov Moscow University of Fine Chemical Technology, Moscow, Russia

4:30 p.m.
Hybrid HVOF and High Power Plasma Spray Gun Coating Advancements for Aero and Land Based Gas Turbine Engine Applications: Mr. Ludwig Guggenheim, Mr. Ralph Herber, Mr. Adrian Vogel and Dr. Robert Gansert, AMT AG, Dottingen, Switzerland, Advanced Materials & Technology Services, Inc., Simi Valley, CA

4:50 p.m.
Development of a Two-Stage Hybrid Technology For Repairing Turbine Blades: Dr. Martin Nicolaus, Dr. Kai Möhwald and Prof. Hans J. Maier, Institute of Materials Science, Leibniz University of Hannover, Garbsen, Germany

5:10 p.m.
Thermal Exposure Testing of a Multilayer Oxidation Protection System for Gamma-TiAl: Prof. Kirsten Bobzin, Mr. Mehmet Öte and Mr. Thomas Frederik Linke, Surface Engineering Institute, RWTH Aachen University, Aachen, Germany

5:30 p.m.
HVOF and HVAF Coatings of Nano-Agglomerated Tungsten Carbide—Cobalt Powders for Water Droplet Erosion Application: Dr. Fariba Tarasi, Mr. Mohammad Sadegh mahdipoor, Prof. Ali Dolatabadi, Prof. Mamoun medraj and Prof. Christian Moreau, MIE, Concordia University, Montréal, QC, Canada, Mechanical and Industrial Engineering, Concordia University, Montréal, QC, Canada

5:50 p.m.
Wear Characteristics of Mixed Lubricious Oxide Coatings: Dr. Satish Dixit, Dr. Osman Levent Eryilmaz and Dr. Ali Erdemir, Plasma Technology Inc., Torrance, CA, Argonne National Lab, Chicago, CA

6:10 p.m.
In-Situ Observation of Laves Phase Precipitation and Oxidation of HVOF Deposited Tribaloy™ T-800 (CoMoCrSi alloy) Coatings: Mr. Andrew Vackel, Mr. David Lee and Prof. Sanjay Sampath, Materials Science and Engineering, Stony Brook University, Center for Thermal Spray Research, Stony Brook, NY, Kennametal Stellite, Goshen, IN, Center for Thermal Spray Research, Stony Brook University, Stony Brook, NY

6:30 p.m.
Kinetic Metallization™ of Tungsten Carbide Wear Resistant Coatings: Dr. Ralph Tapphorn, Mr. Howard Gabel and Mr. Travis Crowe, Inovati, Santa Barbara, CA
1:40 p.m.

**Fatigue Crack Growth in Bodies with Thermally Sprayed Coatings:**

Dr. Ondrej Kovarik, Dr. Radek Musalek, Mr. Jan Medricky, Dr. Nicholas Curry, Mr. Stefan Bjorklund, Mr. Libor Tomek and Dr. Jan Siegl,

1. Department of Materials, Czech Technical University, Faculty of Nuclear Sciences and Physical Engineering, Prague 2, Czech Republic,
2. Department of Materials Engineering, Institute of Plasma Physics AS CR, Prague, Czech Republic,
3. Department of Materials, Czech Technical University, Faculty of Nuclear Sciences and Physical Engineering, Prague 2, Czech Republic,
4. Production Technology, University West, Trollhattan, Sweden,
5. University West, Trollhattan, Sweden,
6. Institute of Plasma Physics AS CR, Prague, Czech Republic,
7. Department of Materials, Czech Technical University, Faculty of Nuclear Sciences and Physical Engineering, Prague, Czech Republic

2:00 p.m.

**Influence of Near-Interface Cracks on the Stress Around the TGO in the Thermal Barrier Coatings During Thermal Shock: A Numerical Simulation Study:**

Dr. Liang WANG, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China

2:20 p.m.

**Fracture Behavior and Lifetime Performance of Thermal Barrier Coatings in Thermally Graded Mechanical Fatigue Environments:**

Prof. Yeon-Gil Jung, Ungyu Paik, Jing Zhang, Mr. Zhe Lu and Dr. Sang-Won Myoung,

1. School of Materials Science and Engineering, Changwon National University, Changwon, South Korea,
2. Department of Energy Engineering, Hanyang University, Seoul, South Korea,
3. Department of Mechanical Engineering, Indiana University – Purdue University Indianapolis, Indianapolis, IN

2:40 p.m.

**Epitaxial Grain Growth during 8YSZ Splat Formation on Polycrystalline YSZ Substrates by Plasma Spraying:**

Ms. Er-Juan Yang, Dr. Xiao-Tao Luo, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li and Prof. Chang-Jiu Li,

State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

3:00 p.m.–3:30 p.m.

**Refreshment Break • Exhibit Halls A&B**

**3:30 p.m.**

**Electrical Characterization of Thermally Sprayed Insulating Ceramic Coatings:**

Dr. Kari Lahti, Minna Niittymäki, Tomi Suhonen and Jarkko Metsäjoki,

1. Electrical Engineering, Tampere University of Technology, Tampere, Finland,
2. Thermal Spray, VTT Technical Research Centre of Finland, Espoo, Finland
3:50 p.m.
Investigation of Atmospheric Plasma Sprayed Forsterite (Mg$_2$SiO$_4$) Coatings for High-Temperature Electrical Insulation Applications: Dr. Atin Sharma$^1$, Ms. Nadine Heiden$^2$, Dr. Johannes Rauch$^3$, Mr. Jonathan Gutleber$^4$ and Dr. Montia Nestler$^5$, 1Oerlikon Metco (US) Inc., Westbury, NY, 2Oerlikon Metco WOKA GmbH, Barchfeld-Immelborn, Germany, 3Oerlikon Metco WOKA GmbH, Barchfeld, NY

4:10 p.m.
Evaluation of the Influence of Flame Spraying Parameters on Microstructure and Electrical Conductivity of Al-12Si Coatings Deposited on Polyurethane Substrates: Mr. Sayed Hossein Ashrafizadeh, Dr. Pierre Mertiny and Dr. André McDonald, Mechanical Engineering, University of Alberta, Edmonton, AB, Canada

4:30 p.m.
Constrained Sintering on Thermally Sprayed Thermal Barrier Coatings by Mismatch of CTE Between Substrate and Yttria Stabilized Zirconia: Mr. Guang-Rong Li, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

8:20 a.m.
Design of Experiment for Advanced Nanostructured WC-12Co Coating HVOF: Dry Solid Particle erosion Tests: Dr. ahmed Abdullah alhamed, Me, dublin city university, Dublin, Ireland

8:40 a.m.
Development of Processing Windows for New Generation HVOF Carbide-based Coatings: Dr. Andrew S.M. Ang$^1$, Mr. Hugo Howse$^2$, Prof. Christopher C. Berndt$^1$ and Dr. Scott Wade$^1$, 1Industrial Research Institute Swinburne (IRIS), Swinburne University of Technology, Hawthorn, VIC, Australia, 2United Surface Technology, Altona, VIC, Australia

9:00 a.m.
Mitigating Corrosion of Carbon Steel in Supercritical CO$_2$ Environments using HVOF Coatings: Dr. Shiladitya Paul, Materials Group, TWI, Cambridge, United Kingdom

9:20 a.m.
Protecting Threaded Surfaces on Tubing Strings Used in the Oil and Gas Industry: Dr. Sergei Mankovsky$^1$, Dr. Alexander Rigin$^1$, Mr. Dinar Ishmukhatov$^1$, Mr. Grachev Oleg$^2$ and Dr. Lev Baldaev$^3$, 1Technological systems for protective coatings, Moscow, Russia, 2Technological systems of Protective Coatings, Ltd., Moscow, Russia, 3TSPC Ltd., Moscow, Russia

9:40 a.m.
The Use of Novel Clad Powders to Produce HVOF-Sprayed Coatings for Oil/Gas Applications: Dr. Gary Fisher$^1$, Ms. Anita Hancox$^2$ and Dr. Tonya B. Wolfe$^1$, 1Alberta Innovates—Technology Futures, Edmonton, AB, Canada, 2Allomet Corporation, North Huntingdon, PA

10:00 a.m.-10:30 a.m.
Refreshment Break - Meeting Space Foyer

10:30 a.m.
Tungsten Carbide-Based HVAF Coatings for Protection of Petrochemical, Oil Drilling and Hydro-Power Equipment Against Wear and Cavitation: Dr. Andrew A. Verstak$^1$ and R.K. Kumar$^2$, 1Kermetico Inc., Benicia, CA, 2Materials Technology, Central Power Research Institute, Bangalore, India
8:00 a.m.
Detection and Avoiding of Unmelted Wire Pieces During Wire Arc Spraying: Mr. Alexander Atzberger, Mr. Stefan Eichler¹, Prof. Werner Mayr², Mr. Stefan Kirner³, Dr. Jochen Zierhut⁴, Prof. Jochen Schein¹ and Dr. Stephan Zimmermann⁵, ¹Lab for Plasma Technology (LPT), EIT 1, Universitaet der Bundeswehr Muenchen, Neubiberg, Germany, ²Electrical Measurement Techniques, University of Applied Sciences Munich, Munich, Germany, ³Zierhut Messtechnik GmbH, Muenchen, Germany

8:20 a.m.
Offline Acoustic Plasma Spray Nozzle Wear State and Characteristic Identification: Mr. Taylor K. Blair¹, Dr. Gary R. Pickrell¹, Mr. Michael Cybulsky², Mr. Raymond Sinatra³ and Dr. Romesh Batra⁴, ¹Materials Science and Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, ²Materi- als, Rolls-Royce Corporation, Indianapolis, IN, ³Rolls Royce Coporation, Indianapolis, IN, ⁴ESM, VirginiaT- ech, BLACKSBURG, VA

8:40 a.m.
Output Signal Characteristics of Thyristor- and Transistor-Controlled Power Supplies and its Influence on the Electric Discharge in a Plasma Spray Process: Hartmut Koschnitzke¹, Dr. Majid A. Nabavi¹, Mr. Uwe Jagow² and Dr. Alexander Schwenk³, ¹Oerlikon Metco AG (Switzerland), Wohlen, Switzerland, ²RnD and Maintenance, Oerlikon Metco AG Wohlen, Wohlen, Switzerland, ³Oerlikon Metco, Wohlen, Switzerland, ⁴Sulzer Metco AG (Switzerland), Wohlen, Switzerland

9:00 a.m.
Spatial Mapping of Plasma Sprayed Coating Thickness Using X-Ray Fluorescence and Laser Triangulation: Dr. Kendall J. Hollis¹, Dr. Deborah A. Summa², Ms. Velma M. Lopez¹ and Dr. George J. Havrilla³, ¹MST-6, Los Alamos National Laboratory, Los Alamos, NM, ²Los Alamos National Laboratory, Los Alamos, NM

9:20 a.m.
Eddy Current Measurement Technique For Bi-Layer Thermal Barrier Systems: Mr. Gregory M Smith, Nicholas Erb, Mats-Olov Hansson and Jimmy Johansson, GKN Aerospace Engine Systems, Trollhättan, Sweden

9:40 a.m.
Effect of Spraying Parameters on the Strain of Plasma Sprayed YSZ Coatings Measured by the Digital Image Correlation Method during the Tensile Test: Mr. Lele Ruan, Mr. Zexin Yu, Prof. Weize Wang and Mr. Yufan Chen, East China University of Science and Technology, Shanghai, China

10:00 a.m.–10:30 a.m.
• Refreshment Break • Meeting Space Foyer •

10:30 a.m.
On the Relationship Of Tungsten Composition To Coating Properties: Dr. Jose Colmenares¹, Mr. Ronald Molz², Dr. Ramachandran Seshadri³ and Mr. David Hawley⁴, ¹Equipment R&D, Oerlikon Metco, Westbury, NY, ²Technology Research, Oerlikon Metco, Westbury, NY, ³Materials Science and Engineering, Center for Thermal Spray Research, Stony Brook University, Stony Brook, NY, ⁴Equipment Operations, Oerlikon Metco, Westbury, NY

10:50 a.m.
Transplantation of Thermal Sprayed Coatings: Mr. Patrick Knödler¹, Mr. Achim Peuker², Mr. Dennis Freiburg², Mr. Maik Otten¹, Dr. K. Möhwald¹, Prof. Dirk Biermann² and Prof. Hans J. Maier¹, ¹Institute of Materials Science, Leibniz Universität Hannover, Garbsen, Germany, ²Institute of Machining Technology, TU Dortmund, Dortmund, Germany

11:10 a.m.
Influence of Spray Parameters on the Microstructure and Properties of High Velocity Oxy-Fuel Sprayed Multimodal WC-17Co Coatings: Prof. Gang-Chang Ji¹, Dr. Xiao Chen², Dr. Hong-Tao Wang³ and Xiao-Bo Bai⁴, ¹School of Mechanical & Materials Engineering, Jiujiang University, Jiujiang, China, ²School of mechanical and material engineering, Jiujiang University, Jiujiang, China, ³School of mechanical and material engineering, jiujiang university, jiujiang, China, ⁴Jiujiang University, Jiujiang, China
TECHNICAL PROGRAM • THURSDAY, MAY 14, 2015

Electronics and Semiconductor
8:00 a.m.–12:10 p.m.
Meeting Room: 101B

Session Chairs:
Dr. Jennifer Sun
Applied Materials, Inc,
Sunnyvale, CA USA
Dr. Robert Gansert
Advanced Materials & Technology Services, Inc
Simi Valley, CA USA

8:00 a.m.
Thermal Spray Coating Opportunities & Considerations in the Semiconductor Equipment Industry:
Dr. Jennifer Sun, Applied Materials, Inc, Sunnyvale, CA

8:20 a.m.
Functional Materials and Multilayers by Thermal Spray: Opportunities and Challenges:
Dr. Sanjay Sampath, Materials Science and Engineering, Stony Brook University, Center for Thermal Spray Research, Stony Brook, NY

8:40 a.m.
Latest Developments of OBZ Innovation for Cold Sprayed Electrically Conducting Coatings Applied to Electrically Insulating Ceramic Coatings:
Dr. Jan Luth, Mr. Mateusz Cichosz, Mr. Michael Lehmann, Mr. SH Hartmann and Dr. Fabian Trenkle, obz innovation gmbh, Bad Krozingen, Germany

9:00 a.m.
Metallization of Ceramics by HVAF-Spraying:
Mr. Roberto Puschmann1, Dr. Filofteia-Laura Toma1, Mr. Thomas Kuntze1 and Mrs. Irina Shakhverdova2, 1Fraunhofer IWS, Dresden, Germany, 2Fraunhofer Institute for Material and Beam Technology (IWS), Dresden, Germany

9:20 a.m.
Relationship Among Process, Microstructure and Electrical/Protective Performances of Plasma Sprayed MCO coatings in SOFCs:
Ms. Su Jung Han, Dr. Ramachandran Seshadri, Dr. Yikai Chen, Dr. Richard J. Gambino and Prof. Sanjay Sampath, Materials Science and Engineering, Center for Thermal Spray Research, Stony Brook University, Stony Brook, NY

9:40 a.m.
Development of Low Oxide Reactive Metal Plasma Spray Coatings for Semiconductor Applications:
Dr. Robert Gansert1 and Dr. Rajan Bamola1, 1Advanced Materials & Technology Services, Inc., Simi Valley, CA, 2Surface Modification Systems Inc., Santa Fe Springs, CA

10:00 a.m.–10:30 a.m.
• Refreshment Break • Meeting Space Foyer •

10:30 a.m.
Effects of Process on the Coatings for Semiconductor Chamber Components:
Dr. Yikai Chen1 and Dr. Jennifer Sun2, 1Materials Science and Engineering, Center for Thermal Spray Research, Stony Brook University, Stony Brook, NY, 2Applied Materials, Inc, Sunnyvale, CA

10:50 a.m.
The Possibility of Application of Cold Sprayed Coatings as Conducting Paths on Polymers:
Prof. Lech Pawlowski1, Mrs. Aleksandra Malachowksa1, Mr. Marcin Winnicki2, Prof. Andrzej Ambrozia2 and Dr. Tomasz Piasecki3, 1SPCTS, University of Limoges, Limoges, France, 2Faculty of Mechanics, Wroclaw University of Technology, Wroclaw, Poland, 3Wroclaw University of Technology, Wroclaw, Poland

11:10 a.m.
Microstructure and Dielectric Properties of Thermal Sprayed Aluminum for Electrical Instrumentation Applications:
Dr. Damon D. Jackson, Quantum Design Inc, San Diego, CA

11:50 a.m.
Process Dependent Microstructure and Electrical/Protective Performances of Plasma Sprayed MCO coatings in SOFCs:
Ms. Gregory M. Smith, Ms. Su Jung Han, Dr. Ramachandran Seshadri, Dr. Yikai Chen, Dr. Richard J. Gambino and Prof. Sanjay Sampath, Materials Science and Engineering, Center for Thermal Spray Research, Stony Brook University, Stony Brook, NY
8:00 a.m.
Improvement of Corrosion Resistance of Thermal-Sprayed Stainless Steel Coating by Addition of Some Deoxidizing Elements: Dr. Nobuaki Sakoda¹, Prof. Hidenori Era¹, Mr. Kohei Hashimoto², Dr. Zhensu Zeng³ and Mrs. Sayaka Sako¹, ¹Kurashiki Boring Kiko Co., Ltd., Japan, Asakuchi, Japan, ²Kyushu institute of Technology, Kitakyushu, Japan

8:20 a.m.
Improved Corrosion Resistance of Plasma-Sprayed NiCr-Mo Coating with Shell-Core-Structured Powder by Improving Lamellar Interface Bonding: Dr. Jia-Jia Tian, Prof. Guan-Jun Yang, Prof. Cheng-Xin Li, Dr. Xiao-Tao Luo and Prof. Chang-Jiu Li, State Key Laboratory for Mechanical Behavior of Materials, Xi’an Jiaotong University, Xi’an, China

8:40 a.m.
An Investigation on Microstructural Properties of Plasma Sprayed Tungsten Carbide Enhanced with Partially Stabilized Zirconia: Ms. Sahar Abuali Galedari, Mr. Mehdi salimi Jazi¹, Prof. Fardad Azarm¹, Prof. Ying Huang² and Prof. Xiangqing. W Tangpong², ¹Mechanical Engineering, North Dakota State University, Fargo, ND, ²Civil and Environmental Engineering, North Dakota State University, Fargo, ND

9:00 a.m.
The Many Facets and Complexities of 316L and the Effect on Properties: Mrs. Ingrid Hauer Miller, Surface coating, Höganäs AB, Höganäs, Sweden

9:20 a.m.
Effect of Microstructure, Morphology and Amount of Tungsten Carbides on the Properties of Laser Cladded MMC Coatings: Ms. Barbara Maroli and Dr. Senad Dizdar, Global Development, Höganäs AB, Höganäs, Sweden

9:40 a.m.
Synthesis of Thermal Spray Grade Silicon Carbide Feedstock Powder for Plasma Spray Deposition: Mr. Fahmi Mubarok and Prof. Núria Espallargas, Department of Engineering Design and Materials, NTNU, Trondheim, Norway

10:00 a.m.-10:30 a.m.
• Refreshment Break • Meeting Space Foyer •

10:30 a.m.
Thermal Sprayed Luminous Metallic and Ceramic Coatings for Wear Indication and Product Authentication: Mr. Michael Lehmann, Obz Innovation GmbH, Bad Krozingen, Germany

10:50 a.m.
Al/Al₂O₃ Cermets by Plasma Spraying: Optical Response of Experimental and Numerical Materials: Denis Toru¹, Dr. Aurélie Quet¹, Dr. Domingos De Sousa Meneses², Romain Echegut², Dr. Leire Del Campo³, Hervé Piombini³, Dr. Patrick Echegut² and Dr. Luc Bianchi³, ¹CEA DAM Le Ripault, Monts, France, ²CNRS-CEMHTI, Orléans, France

8:00 a.m.
Synthesis of TiC/Ti Hybrid Coating by Reactive Plasma Spraying at Low Pressure: Dr. Pengjiang He¹, Mr. Frederic lapostolle¹ and Prof. Hanlin LIAO², ¹IRTES-LERMPS, University of Technology of Belfort-Montbéliard, Belfort, France, ²IRTES-LERMPS, University of Technology Belfort—Montbéliard, Belfort, France

8:20 a.m.
Effect of Strain Rate on Microstructure Evolution and Compressive Deformation Behavior of High Strength Copper Coating Materials Fabricated by the Kinetic Spray Process: Prof. Kee-Ahn Lee¹, Mr. Min-Suk Baek¹, Mr. Young-Kyun Kim¹ and Dr. Hyung Jun Kim², ¹Department of Advanced Materials Engineering, Andong National University, Andong-si, South Korea, ²RIST, Pohang, South Korea

8:40 a.m.
The Particle Properties Sprayed by APS of Different Steels Composition During the Flight: Mr. Rodolpho Fernando Vaz¹, Dr. Anderson Geraldo Mendina Pukasiewicz², Dr. Ramón Sigifredo Cortez Paredes³ and Mr. Andre Chicoski³, ¹Mechanical Engineering, LACTEC Institute of Technology for Development, Curitiba, Brazil, ²Mechanical Engineering, UTFPR—Ponta Grossa, Ponta Grossa, Brazil, ³UFFPR, Curitiba, Brazil
9:00 a.m.
To Study the Behavioral Characterization of SS304 and SS310 Steel Coated with NiCr-Cr2C3 Alloy by Manual Metal Arc Welding: Mr. Gurpyar Singh, Mechanical Engineering, GURU KASHI UNIVERSITY, Bathinda, India

9:20 a.m.
The Effect of Heat Treatment on Microstructure And Tensile Properties of Cu-Based Composites Reinforced with Zr57Cu20Al10Ni8Ti5 Metallic Glass: Mr. Nan KANG, Dr. Pierre CODDET, Prof. Hanlin Liao and Prof. Christian CODDET, LERMEPS, University of Technology of Belfort-Montbéliard, Belfort, France

9:40 a.m.
Wear and Friction Behavior of Plasma Nitrided Hot Forming Tool Steels: Mr. Sunpreet Singh and Dr. Manpreet Kaur, Mechanical, Baba Banda Singh Bahadur Engineering College, Fatehgarh Sahib, Punjab, India, Fatehgarh Sahib, India

10:00 a.m.-10:30 a.m.
• Refreshment Break • Meeting Space Foyer •

10:30 a.m.
Surface Modification of Ceramic Thermal Sprayed Coatings by Sealing: Ms. Alsu Ahmetgareeva¹, Dr. Lev Baldaev¹, Mr. Sergey Baldaev¹, Dr. Tat’yana I’inkova² and Mr. Ivan Mazilin¹, ¹TSPC Ltd., Moscow, Russia, ²Kazan National Research Technical University named after A. N. Tupolev, Kazan, Russia

10:50 a.m.
Effect of Expansion Ratio of Rectangular Nozzles on Spray Pattern of Copper Coatings in Cold Spraying: Prof. Kazuhiko SAKAKI¹, Mr. Takuma AKASHI¹ and Dr. Takashi HOSONO¹, ¹Faculty of Engineering, SHINSHU University, Nagano City, Japan, ²Chubu Plant Service Co., Ltd., Nagoya, Japan

8:00 a.m.
Cold Spray and Reaction Sintering of Ti-TiAl3 Composite Coatings: Dr. Volf Leshchynsky¹, Dr. Oleksandra Bielousova¹ and Prof. Anatoli Papyrin¹, ¹Institute for Diagnostic Imaging Research, University of Windsor, Windsor, ON, Canada, ²DPI Laboratory, Ecole Nationale d’Ingénieurs de Saint-Etienne (ENISE), Saint-Etienne, France, ³Cold Spray Technology, Albuquerque, NM

8:20 a.m.
The Micro Structure and Tribological Properties of Liquid-Fuel HVOF Sprayed Fine Wc-Co-Cr Coating: Mr. Rohit Upadhyaya¹, Dr. Sharad Shrivastava¹, Mr. S.C Modi² and Mr. A Modi², ¹Birla Institute of Technology and Science, Pilani INDIA, Pilani, India, ²R&D, Metallizing Equipment Company, Jodhpur, India

8:40 a.m.
High Temperature Coatings Based on Aluminum Phosphate: Dr. Lingyan Kong, DIVISION OF SURFACE ENGINEERING, Institute of metal research, CAS, Shenyang, China

9:00 a.m.
Preparation and Oxidation Behavior of Thermal Barrier Coatings with a TiAl3 Bond Coat on γ-TiAl Alloy: Prof. Tianying Xiong, DIVISION OF SURFACE ENGINEERING, Institute of metal research, CAS, SHENYANG, China

9:20 a.m.
Effect of Particle Morphology on the Tribological Behavior of Cold Sprayed Al MMC Coatings: Mr. J. Michael Shockley¹, Prof. Richard R. Chromik¹, Dr. Sylvie V. Descartes² and Dr. Phuong Vo³, ¹Mining and Materials Engineering, McGill University, Montreal, QC, Canada, ²Laboratoire de Mécanique des Contacts et des Structures, INSA de Lyon, Lyon, France, ³National Research Council Canada, Boucherville, Montreal, QC, Canada
9:40 a.m.
Preparation and Oxidation Behavior of a TiAl3 Coat on TiAl Alloy by Cold Spray: Prof. Tianying Xiong, Division of Surface Engineering, Institute of Metal Research, CAS, Shenyang, China

10:00 a.m. - 10:30 a.m.
• Refreshment Break • Meeting Space Foyer •

10:30 a.m.
LaMgAl11O19 Coating for Thermal Barrier Applications Produced by EB-PVD: Dr. Armen Kuzanyan1, Silva Petrosyan2, Georgi Badalyan1, Astghik Kuzanyan2 and Prof. Vassilis Stathopoulos3, 1MS, Institute for Physical Research, National Academy of Sciences, Ashtarak, Armenia, 2LLFS, Institute for Physical Research, National Academy of Sciences, Ashtarak, Armenia, 3Department of Electrical Engineering, Technological Educational Institute of Sterea Ellada, Psachna Chalkida, Greece

10:50 a.m.
Preparation of Inorganic Ceramic Coatings on γ-TiAl Alloys: Dr. Lingyan Kong, Division of Surface Engineering, Institute of Metal Research, CAS, Shenyang, China

11:10 a.m.
Effects of the Heat Treatments on the Corrosion Rate of Ni-base Alloy Coatings Applied by Thermal Spray: Dr. José Cabral1, Mrs. Jamnie Achem1, Dr. Facundo Almeraya2, Dr. Patricia Zambrano3, Dr. Carlos Poblano4 and Dr. Citlalli Gaona3, 1Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Mexico, 2Aeronautical Materials, Universidad Autónoma de Nuevo León, Apocada, Nuevo León, Mexico, 3Facultad de Ingeniería Mecánica y Eléctrica, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Mexico, 4Centro de Tecnología Avanzada, El Marques, Mexico

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- Thermal Spray Technologies
- Two (2) electives from below

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- Thermal Spray Technologies
- Managing a Thermal Spray Operation
- Thermal Spray Safety Management

Operator/Technician Track
- Introduction to Thermal Spray
- Thermal Spray Safety for Operators
- Thermal Spray Processes Practical Lab (On-Site)
- One (1) elective from below

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- Automotive
- Tungsten-Carbide Overlays
- Oil and Gas
- Advanced Diagnostics
- Robotics

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Welcome

I'd like to welcome each of you to the 2015 IMS Microstructural Characterization of Aerospace Materials and Coatings—co-Located with AeroMat and ITSC here in Long Beach, California. It is a very exciting time for IMS as we continue to grow and adapt, yet remain motivated and responsive to the needs and challenges in our industries and we feel that the co-location with AeroMat and ITSC will help bring top speakers and innovative topics to you in one location. The Microstructural Characterization of Aerospace Materials and Coatings is an exciting area in which to work, study, and play, and we will continue to meet and bring inspired people together in forums like this, to ensure IMS remains at the cutting edge in our industries.

With the co-location we believe this year’s conference will draw attendance from leading companies and professionals from all over the world. There are speakers representing industry, government policy makers, as well as academic scholars and researchers will present and discuss the latest topics in Aerospace material processing, focusing on strategies, concepts and techniques.

Here is what you can expect to experience and see as well as what we hope to achieve over the next few days here in Long Beach.

We have a hands on workshop scheduled on how to organize and run a failure investigation with Dr. Dan Dennies as the instructor.

There are more than 15 speakers and sessions ranging from failure analysis, characterization of aerospace fasteners, phase stability in high cobalt containing nickel based super alloys, to recent innovations for characterizing metallic aerospace materials with electron backscatter diffraction. And many other talks on microstructural characterization of aerospace materials.

I’d like to thank each of you for attending our conference and bringing your expertise to our gathering. As organization leaders, who have the vision, knowledge, the wherewithal, and the experience to help us pave our way into the future. You are truly our greatest asset today and tomorrow, and we could not accomplish what we do without your support and leadership. Throughout this conference, I ask you to stay engaged, keep us proactive and help shape the future of IMS.

Sincerely,
Brian Joyce, IMS Event Committee Chair

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Thank You to the Microstructural Characterization of Aerospace Materials and Coatings (IMS) Organizing Committee for their time and support in making this a successful event

Mr. Brian J. Joyce, Chair  
Regional Sales Manager  
Barton International

Mr. David Chang  
Technical Surveillance Metallurgist  
Rolls-Royce Corporation

Dr. Donald F. Susan  
Principal Member of Technical Staff  
Sandia National Laboratories

Mr. Jaret Frafjord  
Technical Director  
Curtiss-Wright

Mr. James Martinez  
Materials Scientist  
NASA Lyndon B. Johnson Space Center
Proceedings can be found online at asminternational.org. See page 3 for download instructions.

The IMS Technical Program is in Room 203C.

Monday, May 11, 2015

8:30–8:45 a.m.
Welcoming Remarks – Brian Joyce (15 min)

SESSION 1

Session Chair:
Brian Joyce
Barton International

8:45–9:15 a.m.
Dan Dennies, Exponent Failure Analysis Associates
How Things Go Wrong - Case Studies in Failure Analysis & R&D

9:15–9:45 a.m.
Frauke Hogue, Hogue Metallography
Characterization of Aerospace fasteners - Structures and Imperfections

9:45–10:15 a.m.
Tom Murphy, Hoeganaes Corporation
Metallographic Testing of Powders Intended for Additive Manufacturing

10:15–11:15 a.m.
VIP Expo Tour or free time to attend ITSC and AeroMat Technical Sessions. (Note: Qualified attendees were notified regarding the acceptance into the VIP Expo Tour.)

11:15 a.m.–12:00 p.m.
Keynote presentation
Hamish L Fraser, The Ohio State University
Director, Center for the Accelerated Maturation of Materials

12:00 -1:15 pm
• Lunch • Exhibit Halls A&B •

COMBINED PLENARY SESSION
(IMS/AEROMAT/ITSC) ON THE SHOW FLOOR

1:30 pm–3:00 pm
Dr. John Grotzinger
Chief Scientist and Head of Strategic Planning for the Mars Rover Mission

3:00–3:30 p.m.
• Refreshment Break • Exhibit Halls A&B •

SESSION 2

Session Chair:
Rick Blackwell
ITW Buehler

3:30–4:00 p.m.
Gabe Lucas, Scot Forge Company
Revealing Overheating in Aluminum Alloy 7050

4:00–5:30 p.m.
Dedicated time to visit Exhibitors or to attend AeroMat/ITSC Sessions.

5:30 pm – 7:00 p.m.
• Expo Welcome Reception • Exhibit Halls A&B •
Tuesday, May 12, 2015

SESSION 3

Session Chair:
David Chang
Rolls-Royce Corporation

8:30–9:00 a.m.
Lisa Deibler, Sandia National Laboratories
Microstructural and Mechanical Characterization of Direct Metal Laser Sintered AlSi10Mg

9:30–10:00 a.m.
Jeff Rodelas, Sandia National Laboratories
Artifact-Free Determination of Weld Metal Constitution in Austenitic Stainless Steels

10:30–11:00 a.m.
Matt Nowell, EDAX Inc.
Recent Innovations for Characterizing Metallic Aerospace Materials with Electron Backscatter Diffraction (EBSD)

10:00–10:30 a.m.
• Refreshment Break • Exhibit Halls A&B •

SESSION 4

Session Chair:
Donald Susan
Sandia National Laboratories

10:30–11:00 a.m.
George Wildridge, IMR
Microstructural Characterization of Machined Surfaces in Aerospace Alloys

11:00 a.m.–11:30 p.m.
P.M. Mignanelli, University of Cambridge (UK)
The Role of Solid Solution Strengthening Additions and Thermal Exposure on the Behaviour of a Model Nickel-base Superalloy

1:00 – 3:30 p.m.
COMBINED PLENARY SESSION (ITSC/AeroMat/IMS)

1:00 p.m.
Aeromat: Mr. Humberto Luiz de Rodrigues Pereira presenting on Advanced Structural Materials

1:45 p.m.
ITSC/TSS Award Presentations

2:00 p.m.
ITSC: Dr. Robert Vaßen, Recent Advances in Thermal Sprayed Thermal Barrier Coatings: including new materials, innovative thermal spray processes and advanced performance assessment methods

2:45 p.m.
IMS: Dr. Frank Muecklich, European School of Materials presenting on Understanding Microstructure Formation by 3D Analysis in the Micro, Nano and Atomic Scale

12:00 – 1:00 p.m.
• Lunch • Exhibit Halls A&B •

SESSION 5

Session Chair:
Brian Joyce
Barton International

4:00–4:30 p.m.
Asim Tewari, IIT Bombay
Microstructural Deformation in Shear Zones during Machining of Titanium Alloys with Varying β Phase Fraction

4:30–5:00 p.m.
K.A. Christofidou, University of Cambridge (UK)
Phase Stability in High Cobalt Containing Nickel Based Superalloys

7:00 p.m.–10:00 p.m.
• Social Event* • Queen Mary
Transportation Provided at Hyatt Regency and Hyatt Pike •
*Ticket Required & Sold Separately
Wednesday, May 13, 2015

SESSION 6

8:30–9:00 a.m.
Baillie McNally, Worcester Polytechnic Institute
Experimental Verification of Through-Process Modeling of Cold Spray Al Alloys

9:00–9:30 a.m.
Tony Havics
A Few Microscopical Techniques for the Characterization of Materials

9:30–10:00 a.m.
Asim Tewari, IIT Bombay
Stereological Estimation of Damage Evolution in CFRP under Cyclic Loading

10:00 – 10:30 a.m.
• Refreshment Break • Exhibit Halls A&B •

10:45–1:15 p.m.
Allied Facility Tour
Boarding begins at 10:45 a.m.
Departs Hyatt Regency at 11 a.m.
Arrives at Plant at 11:20 a.m.
Tour Begins 11:30
Refreshment&Networking Break: 12:15 – 12:45 p.m.
Boarding begins at 12:45 pm
Bus Departs at 12:55 pm
Arrives at Hyatt Regency at 1:15 pm

End of conference

EDUCATION COURSE

EDUCATION WORKSHOP WILL BE CONDUCTED ON SUNDAY, MAY 10TH AT THE HYATT REGENCY LONG BEACH

Instructor: Daniel P. Dennies, Ph.D., P.E., FASM
Course: How to Organize and Run a Failure Investigation

Date: Sunday, May 10, 2015
Time: 8:30 am–4:30 pm
The course is included in the conference registration fee

Course Objective
You will learn a proven systematic approach to failure investigation, which utilizes examples from the aerospace industry and teaches the steps you need to follow. The effect of various failure sources, such as corrosion, on the organization of the investigation will be analyzed. It will provide a learning platform for engineers from all disciplines; materials, design, manufacturing, quality and management.

Learning Objectives
Upon completion of this course, you should be able to:

• Identify the steps necessary in any failure investigation
• Describe the benefits of an organized failure investigation
• Apply the steps to a systematic approach for problem solving
• Employ fault tree analysis, failure mode assessment and technical plan creation
• Assess how different failure sources alter the investigation process

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• Managers
• Designers
• TQM Personnel
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EXHIBIT HALL A

*layout map as of April 20, 2015
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*layout map as of April 20, 2015
EXPO WELCOME RECEPTION
Monday, May 11
5:30 p.m.–7:00 p.m.

Sponsored by:

1. Wine & Beer

2. Wine Tasting & Cheese*

3. Wine Tasting & Cheese*

4. Beer Tasting*

*Wine and beer tastings from 5:30 p.m. – 6:30 p.m.

PLEASE NOTE, during the expo welcome reception a Remote Pilot Vehicle will be on the tradeshow floor taking aerial shots of the event.
### EXHIBITOR HOURS & DATES

#### Exhibitor Hours

**Monday, May 11, 2015**
12:00 p.m.–7:00 p.m.
Lunch: 12:00 p.m.–1:15 p.m.
*A Tasting of International Cuisine*
Afternoon Refreshment Break: 3:00 p.m.–3:30 p.m.
Expo Welcome Reception: 5:30 p.m.–7:00 p.m.

**Tuesday, May 12, 2015**
9:00 a.m. – 4:00 p.m.
Morning Refreshment Break: 10:00 a.m.–10:30 a.m.
Lunch: 12:00 p.m.–1:00 p.m.
*A Taste of California*
Sponsored By: *BOEING*
Afternoon Refreshment Break: 3:30 p.m.–4:00 p.m.

**Wednesday, May 13, 2015**
9:00 a.m.–4:00 p.m.
Morning Refreshment Break: 10:00 a.m.–10:30 a.m.
Afternoon Refreshment Break: 3:00 p.m.–3:30 p.m.
*Times are tentative and subject to change.*

### Exhibitor Legend

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Allied High Tech Products, Inc.
Booth 1336
TechCut 5 Precision Saw
Allied’s newly updated TechCut 5 Precision Saw will be demonstrated. The saw features a unique interchangeable fixturing system that allows both T-Slot and X-Axis tables to be used, and has a manual wheel to control sample advancement.
www.alliedhightech.com

Buehler
Booth 737
PlanarMet 300 Planar Grinder
Looking to save time in your daily work? The PlanarMet 300 is a compact unit that minimizes space and power requirements while providing high material removal rates and fine surface finishes. Time savings continue beyond just grinding time with quick stone changes, auto dressing and direct specimen holder integration with the EcoMet AutoMet 250/300 series grinder-polisher. Two stones provide solutions for a variety of materials, including those in the aerospace field.
www.buehler.com

GeoCorp.
Booth 923
Thermocouples & Thermocouple Wire
Sourcing the correct thermocouple and thermocouple wire to meet today’s tighter aerospace quality specifications.
www.geocorpinc.com

H.C. Starck GmbH
Booth 1323
Thermal Spray Powders
Overview about the company/Division surface technology; product portfolio and latest product developments.
http://www.hcstarck.com

LQ Material Technologies Co.
Booth 1612
Thermal spray systems, peripherals, integrations, powder and wires
LQ is a company in China manufactures thermal spray systems (incl. flame, arc APS and HVOF spray systems) and peripherals (incl. turntable, lathe, booth, dust collector and tailored made automatic system), the company is especially good at integration of a turnkey project with many years of experiences in the past 20 years in China. LQ also makes thermal spray powder and wire. Besides regular ceramic, alloy, metal, WC based powder, LQ tailored develops new powder for customer. On wire, LQ provides both solid and cored wire.
www.langqiaosurface.com

North American Höganäs AB
North American Hoganas
Booth 1436
Powder Coating Solutions
Hoganas offers a wide range of powders all with that extra service covering the global market. Whatever the spray deposition or welding process you use each affects the final result. 2015 presentational highlights include - mapping of metal matrix carbide type, morphology and amount of WC on wear resistance and microstructure. HVOF vs HVAF effect on erosive wear of Fe base materials such as 6AB. Influence of part size and geometry on properties when laser cladding. Whatever your challenges, take this opportunity to book a meeting with our technical experts during the show.
www.hoganasthermalspray.com

Oerlikon Metco (US) Inc.
Booth 1111
UniCoatPro
Oerlikon Metco 2015 Material Highlights and overview of the new thermal spray controller platform, the UniCoatPro, a feature-rich system platform for all types of spray shops. It combines simple touchscreen operation and the latest safety features with high productivity functionality. www.oerlikon.com/metco

SEDS@UCSD
Booth 728
Tri-D engine
The Tri-D engine is the 1st ever additive manufactured engine designed, printed and successfully tested by a collegiate team with the intention to be the 3rd stage engine of a 3 stage nanosat launcher. It’s composed of cobalt chromium and designed for 200 lbs of thrust.
http://seds.ucsd.edu/

TEC Materials Testing
Booth 1032
TEC is a small, high-tech company that offers state-of-the-art x-ray diffraction systems and accredited lab services to measure residual stress and retained austenite. We can make measurements in our Knoxville, TN laboratory or at your facility. These measurements are a cost-effective way to locate potential failures in aircraft components before they are put in service.
www.TECstress.com

UniqueCoat Technologies, LLC
Booth 1315
HVAF thermal spray equipment
UniqueCoat Technologies will introduce its line of thermal spray equipment including guns for spraying metals and carbide and internal diameters. UCT specializes in HVAF technology which allows users to spray high quality coatings at a much lower cost than HVOF. They also provide powder feeders, twin wire arc equipment, project management, and engineering services. Come see their latest innovation, a fuel gas pumping station which can instantly run multiple spray systems even in cold environments.
www.uniquecoat.com
3M Abrasives Systems Division
Booth 1609
Traditional grinding and finishing methods are proving less effective on many newer, hard-to-grind materials – slowing down production and driving up costs. Now, from rough grinding to final finishing, 3M brings you a complete range of thermal spray solutions designed to meet today’s tough processing challenges.
www.3M.com/thermalspray

Aeromet International PLC
Booth 836
Aeromet are a premier manufacturer of aluminium investment and sand castings for the aerospace industry, worldwide. Being fully aerospace accredited, Aeromet, supply castings that are machined, surface finished and in kit-form, to customers’ requirements. Aeromet are aerospace approved and in serial production with A20X®, the world’s strongest cast aluminium alloy.
www.aeromet.co.uk

AIM MRO
Booth 1523
AIM MRO is a Global leader in the manufacture of super alloy braze products and special process materials used in the original manufacture and repair of turbine components. Our custom manufacturing of braze products, coating and process protective masks and machined and fabricated details provide our customers “one stop shop”.
www.aimmro.com

Allied High Tech Products, Inc.
Booth 1336
For over 32 years, Allied High Tech Products has provided quality products for metallographic sample preparation & analysis. Items on display include Allied’s robust MetPrep 4™ Grinding/Polishing System and precise TechCut 5™ Sectioning Machine, as well as Carl Zeiss microscopes. A full range of consumable products will also be shown.
www.alliedhightech.com

American Stress Technologies, Inc.
Booth 1018
AST provides laboratory services and turnkey systems to measure residual stress and stress related material defects. Our technologies include x-ray diffraction (XRD), hole drilling, ESPI and Barkhausen noise analysis. Applications include analysis and quality control of machining, grinding, heat treatment, welding, forming, & forging of engineered materials. Our products include XStress, Rollscan and Prism.
www.astresstech.com

AMETEK Specialty Metal Products
Booth 1631
AMETEK Specialty Metal Products is a world leader in the research, development and manufacture of water and gas atomized stainless powders, thermal spray powders and other high nickel alloy materials. End markets include energy, automotive, chemical, appliance, lawn & garden, agriculture and lock and hardware, to name a few.
http://www.powderclad.com/

AMS
Booth 1408
We produce and supply the customer design thermal spray Auxiliary equipment including spray room, dust collector, parts and spray gun manipulator, automatic blasting system. Whether you are looking for thermal spray equipment, turnkey installation solutions or coating service, we are your trustworthy and best partner.
http://www.amstechn.com/

AMT AG
Booth 1605
Established in 1975 in Switzerland today AMT AG is one of the leading suppliers of high sophisticated turnkey thermal spray installations, thermal spray components and thermal spray spare and wear parts. During the last ten years AMT AG delivered more than 110 thermal spray installation equipped with the latest technology all around the world.
www.amt-ag.net

ANR Fabrication
Booth 1510

Ardleigh Minerals, Inc.
Booth 1339
Since its inception, Ardleigh Minerals has been specializing in the recycling of materials generated in thermal spray preparation and processing, including cold, flame, HVOF, plasma and wire arc spraying. Ardleigh proudly serves the aerospace, automotive, catalytic, electronic, and thermal spray industries.
www.ardleigh.net

Artec S.p.A./Turbocoating S.p.A.
Booth 1405
ARTEC supplies coating solutions and systems (APS, LPPS/VPS, HVOF) with guarantee on quality and productivity. These include process development, technology transfer, turnkey equipment and services, personnel training and component qualification. ARTEC is also specialized in other related process engineering and VPS/LPPS system refurbishment.
ASB Industries, Inc.
Booth 1519
ASB Industries located on Ohio, USA will feature High Pressure Cold Spray equipment in conjunction with Impact Innovations. Our partnership focuses on materials and equipment development required to achieve unique repairs, OEM production components and additive manufacturing applications in Aerospace, Automotive, oil and gas and more.
www.asbindustries.com

ASM International
Booth 1029
ASM International was founded in 1913 as the American Society for Metals. Today, ASM is the world’s largest association of metals-centric materials scientists and engineers with over 30,000 members worldwide. ASM is dedicated to informing, educating and connecting the materials community to solve problems and stimulate innovation around the world.
www.asminternational.org

ATI
Booth 1008
ATI is one of the largest most diversified specialty materials and components producers in the world. We focus our advanced specialty materials technology, unsurpassed manufacturing capabilities, and innovative products to serve global end use markets with highly diversified and specialized product offerings.
www.atimetals.com

Balazs Nanoanalysis—Air Liquide
Booth 838
BalazsNanoanalysis, a division of Air Liquide Electronics U.S. LP, operates ISO 17025 accredited laboratories that specialize in identifying ultra-trace level contamination. Balazs’ expertise covers materials used in the electronics and other high-tech industries. With each analysis, Balazs brings 40 years of experience to help engineers control their process.
www.balazs.com

Bay State Surface Technologies, Inc.
Booth 1437
Bay State has been manufacturing a complete line of affordable Plasma, Twin-Wire, and Flame Spray equipment for over 50 years. All Bay state equipment is US-made and we also provide a full line of support equipment for complete turnkey solutions. Award winning quality and service, and AS9100 and ISO9001 registered.
www.baystatesurfacetech.com

Boeing Company
Booth 823
Boeing is the world’s largest aerospace company and leading manufacturer of commercial jetliners and defense, space and security systems. A top U.S. exporter, Boeing supports airlines and U.S. and allied government customers in 150 countries. Boeing employs more than 165,000 people across the U.S. and in more than 65 countries.
www.boeing.com

Buehler
Booth 737
By partnering with customers to develop solutions for materials preparation, testing & analysis, Buehler provides equipment and consumables solutions for specific applications and needs. With a strong history in metallography, our knowledge is easily applied to components and sub components, as well as for more specialized materials.
www.buehler.com

C&M Technologies
Booth 1229
C&M Technologies: Production and distribution of premium carbide materials for thermal spraying, laser cladding, welding and other hardfacing processes. Our focus and expertise in carbide materials production and research & development make us a highly qualified partner for you!
www.c-m-tech.com

California Heating Equipment
Booth 739
CHE has over 80 years combined staff experience manufacturing industrial furnaces for the Aerospace, Automotive, Commercial and Military industries. Along with our heat treating equipment services we represent Tenaxol quenchants and INEX silicone carbide tubes. We are a one stop heat treat equipment shop.
www.chefurnaces.com

Carpenter Powder Products
Booth 1610
Carpenter Powder Products is one of the world’s largest suppliers of spherical gas atomized metal powders and consolidated powder metallurgy products. Producing metal powders for over 40 years, our products are engineered to meet the unique performance and quality demands of aerospace, automotive, energy, medical, industrial and consumer applications.
www.cartech.com
Castolin Eutectic  
Booth 1423  
Worldwide leader of application solutions in maintenance, repair and wear protection, Castolin Eutectic helps you improving your machinery’s lifetime, based on more than 100 years of experience in welding, brazing and thermal spraying technologies for professional and innovative solutions. Our motto: Quality, Service and Technical Leadership = Customer Value Added.  
www.castolin.com

CenterLine (Windsor) Limited  
Booth 1615  
CenterLine’s Supersonic Spray Technologies Division (SST™) manufactures cold gas dynamic spray (Cold Spray) metal coating systems and supplies to protect, repair, restore, and refinish manufactured products. SST also performs cold spray research and supplies process development assistance to identify commercially viable applications for Cold Spray technology.  
www.cntrline.com

Cincinnati Thermal Spray  
Booth 1313  
CTS provides high technology coatings to improve the performance of products throughout a variety of industries. We provide solutions in the form of thermal spray coating, dry film lubricants, porcelain enamels, anti-corrosion paints, and protective sealers, along with turnkey service to machine and coat a final product.  
www.cts-inc.net

Coherent Inc.  
Booth 1613  
With superior reliability and performance as its founding principle, Coherent drives innovation and selection by offering a broad spectrum of laser technologies and capabilities, giving customers worldwide a decided advantage as they seek breakthroughs in the development of cutting-edge applications.  
www.coherent.com

Control Vision  
Booth 1237  
Control Vision Inc is a research and development optical sensor company specializing in providing unique solutions for optically and mechanically noisy environments. Our experienced multi-disciplined team believes in basing solutions on solid engineering and physics principles and rigorous testing, and is versatile in working with customers in industry and academia.  
www.controlvisioninc.com

CMI Industry Americas Inc.  
Booth 828  
www.cmigroupe.com

Connert Industrial Solutions, LLC  
Booth 837  
Part cleaning solutions to replace existing systems or provide EH&S compliant solutions for new cleaning tasks in the aerospace, automotive and precision industries. Cleaning and degreasing with solvents, modified alcohols or aqueous media. Successful projects in the aerospace industry for core, composites, mechanical and hydraulic flight controls, landing gears.  
www.connertsol.com

Curtiss-Wright Surface Technologies  
Booth 725  
Curtiss-Wright Surface Technologies (“CWST”) is a leading provider of thermal spray coatings for aerospace and demanding industrial markets with 62 spray booths located in six facilities (AZ, CT, MA, SC, TX and UK.) Coatings Solutions include TBC’s, Abradables, Abrasives, Tribaloy, MCrAlY, and WC/CrC wear resistant coatings. Other capabilities include shot and laser peening, corrosion resistant coatings and analytical testing services.  
www.cwst.com

DeWAL Industries, Inc.  
Booth 1309  
DeWAL Industries is the leader in the manufacture of Thermal, Plasma and HVOF tapes in both single ply and double ply options, holding GE, Pratt & Whitney and Rolls Royce approvals. The double ply tapes are used in the most severe applications and provide an economical solution to multi-layer masking.  
www.dewal.com

DIAMANT Metallplastic GmbH  
Booth 1414  
DIAMANT Metallplastic GmbH is a full-service provider of high quality metal-polymer materials for the metal-working industry. DIAMANT sealers protect thermal spray coatings from corrosion and provide resistance to mechanical and chemical stresses. All products are manufactured in Germany and can be customized for your application.  
www.diamant-polymer.de
Part Cleaning Systems

Cleaning and Degreasing Systems
Heat Treat Industry
Aerospace Components Production and MRO
Hybrid Cleaning
Aqueous, Solvent or Modified Alcohol
Reliable Cleaning and Drying
Competence through 40+ Years of Experience
Single Piece or Bulk Processing
Automatic Loading Options

We are looking forward to your visit at the AeroMat Booth 837

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248.808.0120
www.connertsolutions.com  info@connertsolutions.com
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THERMOCOUPLES & THERMOCOUPLE WIRE
THAT BUILD THE ADVANCED MATERIALS FOR TODAY...

...AND FOR THE FUTURE!

GeoCorp Inc.
419.433.1101 GEOCORPINC.COM

ACCURACY. KNOWLEDGE. AVAILABILITY.
DVS - German Welding Society  
**Booth 1235**  
DVS – German Welding Society is one of the globally acting organizations in joining and surfacing of all types of materials. The technical scientific community of DVS consists of experts represented by almost 19,000 DVS members from industry, trade and science. Research, technology, standardization, training, personnel qualification and certification of personnel and companies are key activities of DVS. These activities set technical trends and make the DVS a pacemaker in the fields of joining, cutting and surfacing. Results are widely published in journals and other media. Transfer of knowledge is communicated by conferences and congresses as well as in international trade shows in various countries.  
[www.dvs-ev.de](http://www.dvs-ev.de)

EDAX Inc.  
**Booth 933**  
EDAX is a leading provider of innovative materials characterization systems encompassing Energy Dispersive Spectrometry (EDS), Wavelength Dispersive Spectrometry (WDS), Electron Backscatter Diffraction (EBSD) and Micro X-ray Fluorescence (XRF). The company designs, manufactures, distributes and services hardware and software solutions for a broad range of industries, educational institutions and research organizations.  
[www.edax.com](http://www.edax.com)

ES3  
**Booth 1337**  
ES3 is a socially responsible, high-end engineering firm specializing in design, development, manufacturing and maintenance of: Aircraft Components, Systems, and Subsystems; Advanced Material Coatings for Aerospace Applications; Specialized Metallurgical, Chemical, Hydraulic, and Mechanical Custom Testing; Computational Methods for Structural Dynamic Analysis; Environmentally Preferred Material Processes.  
[www.ES3Inc.com](http://www.ES3Inc.com)

Evans Analytical Group  
**Booth 832**  
Evans Analytical Group (EAG) is the leading provider of surface analysis and materials characterization laboratory and metallurgical testing services. We specialize in techniques such as GDMS, SEM, TEM, XPS and XRF, providing our aerospace customers with high quality data and fast turnaround. We are ISO 17025, 9001 and Nadcap certified.  
[www.eag.com/mc](http://www.eag.com/mc)

Flame Spray Technologies BV  
**Booth 1323**  
Flame Spray Technologies (FST) is a dynamic, innovative, experienced and hands-on company committed to quality and customer service. FST has always been at the forefront of supplying the thermal spray industry with: • Systems & Equipment • Materials & supplies • Services & Coatings.  
[www.fst.nl](http://www.fst.nl)

Fluxtrol Inc.  
**Booth 732**  
Fluxtrol and the Centre for Induction Technology highlight many of the different industries where we are advancing induction technology with magnetic flux controllers, computer simulation and engineering services. Fluxtrol is a leader in induction heating technology and has a worldwide distribution network for its magnetic flux concentrator products and services.  
[www.fluxtrol.com](http://www.fluxtrol.com)

FUJIMI INCORPORATED  
**Booth 1330**  
Ganzhou Achteck Tool Technology Co.,Ltd  
**Booth 1430**  
Ganzhou Achteck Tool Technology Co.,Ltd is a lead manufacturer of the Thermal Spray Powders in China. Achteck offers the powders used in HVOF,HVAF or APS equipments and the product series cover various industries such as Oil&Gas,Steel,Automotive,Paper,Power,etc. Achteck is ISO 9001 certified ensuring our customers high quality and consistent products.  

GeoCorp, Inc.  
**Booth 923**  
Manufacturer of thermocouples and thermocouple wire with an ISO 17025:2005 calibration lab. Products meet AMS 2750 Rev.E, BAC 5621 K. Currently work with GE, Rolls-Royce, UTC, PCC, ATI and many other aerospace companies. Ask about our GeoSpec material that offers no more than +/- 2°F or .2% max. temperature tolerance.  
[www.geocorpinc.com](http://www.geocorpinc.com)
COMPANY DESCRIPTIONS

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TECNAR Automation Ltd.
Booth 1215
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www.tecnar.com

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Thermach, Inc.
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Verder Scientific, Inc.  
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Booth 913  
VRSim creates training systems designed to enhance basic skills training for industrial trades, and military and defense organizations. Using technology from the gaming industry with state of the art tracking systems and graphics rendering, VRSim produces training systems that are easy to use, fully-immersive, and provide a realistic learning environment.  
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Cell: 805 433-8251

for further information please contact: rgansert@sbcglobal.net or info@amt-ag.net
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Norsk Titanium (NTi) is a Titanium component producer based in Norway that uses its novel game changing Direct Metal Deposition (DMD) technology to produce high quality, complex Titanium components for industrial applications.

NTi’s DMD production method allows for much greater flexibility. By melting wire, metal is deposited directly to a substrate building up a near-net-shape component with greatly reduced need for machining. This method provides substantially lower material wastage, greater production flexibility, reduced costs and greater environmental benefits compared with traditional production methods.

NTi’s patented plasma arc based Direct Metal Deposition (DMD) technology is the first globally and commercially available technology of its kind. It enables large-scale, fully programmable means of achieving large and complex near net shape parts for industrial applications.

Traditionally, complex Titanium components are machined from milled or forged wrought raw material. This method has several drawbacks, such as long raw material lead times, significant machining time and cost, and a high degree of wastage of quality material. In addition, the traditional production methods have limitations with respect to design and shapes possible to produce.

Customer benefits include reduced price, shorter lead times, and increased design flexibility.

Our ambition is to provide reduced cost and production flexibility to existing users of Titanium components, as well as to make Titanium affordable for applications where traditional methods today make it impractical.
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