IMS 2003 in San Antonio

By George Vander Voort, IMS 2003 General Program Chair

The 36th International Metallographic Society (IMS) Convention, now part of the annual Microscopy and Microanalysis (M&M) Convention, was held Aug. 3-7 in San Antonio. By all measures, it was a grand success. The M&M conference had 1,411 registered attendees from 32 countries and more than 800 papers were presented. Additionally, there were 127 exhibiting companies with nearly 1,000 representatives, proving again that meeting with M&M is a mutually beneficial relationship.

IMS was also truly international this year. I co-chaired the conference with Juan Asensio-Lozano, University of Oviedo, Oviedo, Spain, and Barry Jenkins, Jenkins-Kwan Technology Pty. Ltd., Kenmore, Australia. It has been some time since IMS has had people running the meeting from outside North America. In addition, there were speakers from 15 countries. Arun Gokhale, Georgia Tech, and Dennis Hetzner, Timken Research, taught our Sunday educational program. Each gave half-day workshops that were well received.

The International Metallographic Contest (IMC), chaired by Jeff Stewart, Stern Leach Co., and aided by Local Chair Don Diamond, Precision Surfaces International, drew another good number of quality posters from around the world. All winners are highlighted in this issue of SlipLines and some winners will also be featured in Advanced Materials & Processes magazine. Our thanks to the judges for doing another fine job with the IMC.

Unfortunately, our 2003 Sorby Award Winner Prof. Enrica Stagno, University of Genoa, Italy, was unable to attend the conference due to a health problem that restricted her travel. Therefore, as chair of the IMS Awards Committee, I did my best in presenting her work on color metallography through the use of heat tinting to solve many problems with a diverse group of materials.

Dr. Gerhard Sperl, University of Leoben, Austria, presented a tutorial session, a new feature for an IMS meeting, during lunch. The topic was “The Use of Metallography in Archaeological Studies.” One example he discussed was the copper axe head found in 1991 with “Ötzi,” the “Ice Man” (also known in Austria as “Frozen Fritz”), a man who died in the Tyrolean Alps, at an elevation of 3,200 m (10,600 ft) and has been dated to 3300 BC.

Five symposia were offered this year: Metallography and Physical Metallurgy, chaired by myself and Juan Asensio-Lozano; Welding Metallography, chaired by John C. McClure and Larry E. Murr; Standards in Metallography, Microanalysis and Microscopy, chaired by John J. Friel and Robert C. Nester; Image Analysis and Digital Microscopy for Materials Science, chaired by Sidnei Paciornik and Barry Jenkins; and Metallography: Preparation and Application, chaired by William F. Gale and Allan J. Lockley. Our thanks for their efforts and to all the speakers who made it a great technical program!

David Fitzgerald, Precision Surfaces International, handled the IMS portion of the commercial equipment exhibit. As usual, the M&M equipment exhibit is a vast collection of nearly everything microscopists could dream of having – all in one large hall. It is an amazing show. David and his wife, Dale, also arranged the IMS banquet and social activities. We thank them for their fine job.

The social side of the program was also excellent. IMS officers, IMC judges and spouses had a dinner while cruising on the...continued on page 4
President’s Message

By Allan J. Lockley
IMS President

Our second meeting with Microscopy and Microanalysis (M&M) has come and gone, as our 36th annual meeting was held at the Henry B. Gonzalez Convention Center in San Antonio last summer. To those who attended, it was rather obvious that IMS had much to contribute to this conference and that its presence was appreciated. The IMS technical sessions and short courses were well attended and the display of entries for this year’s International Metallographic Contest drew much interest. Over the last two years, some adjusting of our ways has been required to synchronize with the M&M annual meeting. Nevertheless, the Board of Directors and meeting organizers have worked hard to become accustomed with the changes and I’m confident that any remaining snags will be worked out for our 37th annual meeting in Savannah, Ga., in August 2004.

Regardless of whether we hold our annual meeting at the ASM Materials Solutions Conference or the M&M Conference, it is quite clear that IMS is a society that has a unique focus in both the scientific and the industrial world. We may not be the only society that works with microscopy, we may not be the only society that deals with specimen preparation and we may not be the only society involved in the characterization of materials, but we are the society that comprises all such expertise.

Our society is unique. Therefore, it is viable and worth the effort to make it grow and make it effective. As an IMS member, you belong to a unique community of scientists, engineers and technicians. Let’s work together for the benefit of our society. As president, I desire your input, your effort and (if you can) some of your time. As for the society directors and myself, it is our task to ensure that the needs of society members are met. If you have an interest in volunteering in the society, please contact a Board member to discuss the opportunities in more detail.

Al Lockley

Materials Characterization Journal

Materials Characterization, the official journal of the International Metallographic Society, features fully refereed technical articles and short communications on theoretical and practical aspects of materials structure and behavior. The scope ranges from studies of archaeometallurgical materials to the most recent ceramics and space-age alloys.

IMS members can subscribe to the special rate of $69 per year for 10 issues. To subscribe, contact ASM Customer Service, tel: 800/336-5152, ext. 5900 (toll free in U.S. and Canada) or 440/338-5151, ext. 5900; fax: 440/338-4634; e-mail: cust-srv@asminternational.org.

For information on manuscript submittals, contact the Editor-in-Chief Dr. Chris Bagnall, phone/fax:724/836-7837 or e-mail: chrisbagnall@compuserve.com.

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SlipLines

A quarterly publication of the International Metallographic Society, providing organizational news and technical briefs.

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Upcoming ASM Education Courses

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<td>Jeffrey Henry</td>
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<td>Sept. 29 - Oct. 3</td>
<td>Wayne Samuelson</td>
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<td>Fundamentals of Brazing</td>
<td>Oct. 20-22</td>
<td>David Pye</td>
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<td>Nickel and Nickel Alloys</td>
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<td>Heat Treatment of Steel</td>
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<td>Metallurgy for the Non-Metallurgist</td>
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<td>Elements of Metallurgy</td>
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<td>How to Organize and Run a</td>
<td>Dec. 4-5</td>
<td>Daniel Dennies</td>
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<td>Failure Investigation</td>
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<tr>
<td>Metallurgy for the Non-Metallurgist</td>
<td>Dec. 8-12</td>
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<td>Principles of Failure Analysis</td>
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<td>Metallurgy of Welding</td>
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For course descriptions and online registration, visit www.asminternational.org/education. Class size is limited, so register early! All courses will be held at Materials Park, Ohio, unless marked (*).

VISIT THE IMS WEB SITE
www.asminternational.org/IMS

Mark Your Calendar

Upcoming Events

- **Sept. 28 - Oct. 2** – 35th International SAMPE Technical Conference, Dayton, Ohio
  Contact: Society for the Advancement of Material & Process Engineering
  Web Site: www.sampe.org
  E-mail: sampeibo@aol.com

  Contact: ASM International
  Web Site: www.asminternational.org/materialssolutions
  E-mail: cust-srv@asminternational.org

  Contact: National Center for Excellence in Metalworking Technology
  E-mail: wright@ctcgsc.org

  Contact: NASA Tech Briefs
  Web Site: www.techbriefs.com/nano
  E-mail: luke@apbi.net

  Contact: Metal Powder Industries Federation
  Web Site: www.mpif.org
  E-mail: leatherm@mpif.org

- **Nov. 2-4** – International Conference on Structural Aluminum Casting, Orlando, Fla.
  Contact: American Foundry Society
  Web Site: www.afsinc.org
  E-mail: str@afsinc.org

- **Nov. 2-5** – Investment Casting Institute 51st Technical Conference and Expo, Cleveland, Ohio
  Contact: Investment Casting Institute
  Web Site: www.investmentcasting.org
  E-mail: ici@investmentcasting.org

- **Nov. 2-6** – 29th International Symposium for Testing and Failure Analysis (ISTFA 2003), Santa Clara, Calif.
  Contact: ASM International
  Web Site: www.asminternational.org/istfa
  E-mail: cust-srv@asminternational.org

- **Nov. 9-12** – Materials Science & Technology 2003 (MS&T ’03), Chicago, Ill.
  Contact: The Minerals, Metals & Materials Society (TMS)
  Web Site: www.matsitech.org
  E-mail: info@matsitech.org

- **Nov. 17-21** – DOD Tri-Service Corrosion Conference, Las Vegas, Nev.
  Contact: Navmar Applied Sciences Corporation
  Web Site: www.navmar.com/triservice
  E-mail: triservice@navmar.com
The 2003 International Metallographic Contest and Exhibit, held in conjunction with the 36th annual convention of the International Metallographic Society (IMS) in San Antonio attracted entries from Brazil, Japan, New Zealand and Poland, as well as from the United States. Local Chair Don Diamond did an excellent job behind the scenes preparing the entries for judging. His preliminary work and diligence during the contest helped ensure a glitch-free event. The judges (Kathryn Dannemann, Southwest Research Institute; Matthew Jacobs, Cast Metals Institute/American Foundry Society; Bonnie Koske, Mitsubishi Power Systems, Inc.; Kai Lorchaoensery, Lehigh University; Gabe Lucas, Buehler Ltd.; DeAnna Mahutga, Chromalloy Component Services; Donald Norsworthy, Gas Turbine Materials Associates; and David Snow, Pratt and Whitney) conferred 29 awards including 19 cash prizes totaling more than $5,000.

Rick Noecker, a graduate student at Lehigh University, repeated his success of last year by once again winning the prestigious Jacquet-Lucas Award for Best in Show, which includes a cash award of $3,000. His award-winning entry was entitled “Effect of Homogenization Heat Treatment on Critical Pitting Temperature and Sigma Phase Formation in Super Duplex Stainless Steel” (see back page for details). Noecker joins a handful of people who have won multiple Jacquet-Lucas Awards and a very elite group with consecutive wins in the 31-year history of the award. Congratulations to Noecker and his mentors at Lehigh.

The undergraduate student categories (Classes 9 and 10) were very competitive again this year collecting five awards between them. Jeff Farren from Lehigh University was awarded the George L. Kehl Plaque for his first place entry in Class 9 entitled “Microstructural Development of an AISI 1080 to 316L Stainless Steel Functionally Graded Joint Processed with Laser Engineered Net Shaping (LENS).” Another entry from Lehigh and two entries from the University of Massachusetts, Lowell took second place honors in the undergraduate categories.

One of the more unusual and interesting entries was submitted by a team from the Colorado School of Mines. Their entry entitled “Scanning Electron Microscopy of Petrified Wood Archeological Artifacts” received a first place award in Class 5. It described the etching and examination of petrified wood arrowheads in order to determine their origin. Several of the judges expressed their opinion that the entry would have been a close contender for Best in Show if it had included more photomicrographs.

As was the case last year, about 35 percent of the entries were from sources other than colleges and universities. These included four award winners from ArvinMeritor and the ubiquitous George Vander Voort from Buehler Ltd. who received the DuBose-Crouse Award for his first place entry in Class 12. His entry this year was entitled “Metallographic Examination of Structural Steel From the World Trade Center.”

Many thanks to all who participated. Special thanks to Matt Jacobs and DeAnna Mahutga for answering the last minute call to fill two unexpected openings in the judges panel, and thanks to Gabe Lucas for his karma.

A complete list of the award recipients is printed in this issue of SlipLines and is available online at www.metallography.com/ims/sanantonio/winners.htm.

It’s not too early to start planning an entry for next year’s contest. All entries should be sent to Ken Couch, C/O Protech Lab Corp., 147 Island Dr., Hilton Head Island, S.C., 29926. Deadline for entries is July 19, 2004.

For additional information including complete rules, tips for creating a winning entry, judging guidelines and examples of winning entries, contact the Contest Chair Jeff Stewart at jeff@metallography.com or visit www.metallography.com/ims/contest.htm.

IMS 2003 in San Antonio

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San Antonio River Saturday night after the Board meeting and judging was completed. It was a jolly occasion with two boats circling the River Walk three times – one for each serving!

M&M also sponsored two social activities. The opening reception was held Sunday evening at the Institute of Texas Culture. The food was great (and plentiful) and the museum was large and very interesting. Wednesday evening featured a Latin Fiesta at the Villita Assembly Building, sponsored by the Committee of Inter-American Societies of Electron Microscopy (CIASEM), a new group and a co-sponsor of M&M 2003.

All in all, it was a great meeting in every respect. The photographs from the meeting show a few of the highlights (see pages 6-7). Now is the time to start planning for next year’s meeting – so mark your calendar for Aug. 1-5, 2004, in Savannah, Ga., a charming Southern city. See you there!
<table>
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<tr>
<th>Class 1: Light Microscopy - Metals and Metal Alloys Only</th>
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| **1st Place** – Three-Dimensional Metallographic Reconstruction of Solidification Microstructures in Stainless Steel
Lynn Boatner, Stan David and Allison Baldwin, Oak Ridge National Laboratory, Oak Ridge, Tenn. |
| **2nd Place** – Evidence of Static Recrystallized Grain Formation in Extrusion of Al-Mg-Si Alloys
William Van Geertruyden, Lehigh University, Bethlehem, Pa. |
| **Honorable Mention** – Egg-Type Core Microstructure of Immiscible Alloy Powders
C.P. Wang, X.J. Liu, I. Ohnuma, R. Kainuma and K. Ishida, Tohoku University, Japan |

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<th>Class 2: Light Microscopy - All Other Engineering Materials</th>
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| **Honorable Mention** – Morphological Instability in an Sb-Doped Ge Single Crystal
Andrew Deal, University of Florida, Gainesville, Fla. |

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<th>Class 3: Electron Microscopy - Transmission and Analytical</th>
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| **Honorable Mention** – Phase Characterization of Nanofibers of PANI/PMMMA Blends
Keyur Desai and Changmo Sung, University of Massachusetts Lowell, Lowell, Mass. |

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<th>Class 4: Electron Microscopy - Scanning</th>
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| **1st Place** – Electrospinning of Uniform, Beadless Polycarbonate Nanofibers
Nirupama Kattamuri, University of Massachusetts Lowell, Lowell, Mass. |
| **2nd Place** – Micromechanical Characterization of GaSb Microbridges by SEM & FEM
| **Honorable Mention** – Titanium Spider Web
Sesh Tamirisa, Ohio University, Athens, Ohio and Radhakrishna B. Bhat, UES, Inc., Dayton, Ohio and Daniel B. Miracle, Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/MLLMD, Wright-Patterson AFB, Ohio |

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<th>Class 5: Unique, Unusual, and New Techniques in Microscopy</th>
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</table>
| **1st Place** – Scanning Electron Microscopy of Petrified Wood Archeological Artifacts
Tim Casias, Frederick J. Fraikor, Craig Simmons and Steve Kalasz, Colorado School of Mines, Golden, Colo. |
| **Honorable Mention** – Development of Low Loss Grain Oriented Silicon Steel Sheets using Very Thin Forsterite Film with Characteristic Morphology
Yukio Inokuti, IFE Steel Corp., Chiba, Japan |

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<th>Class 6: Color Microscopy</th>
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| **1st Place and Jacquet-Lucas Award** – Effect of Homogenization Heat Treatment on Critical Pitting Temperature and Sigma Phase Formation in Super Duplex Stainless Steel
Rick Noecker, Lehigh University, Bethlehem, Pa. |
| **3rd Place** – Phase Identification in HP50 Nb-Modified Steel
Azmil Abdul Wahab, University of Canterbury, Christchurch, New Zealand |
| **3rd Place** – Fe-Rich Intermetallics in Al-Si Casting Alloy
Hamish R. McIntyre, University of Canterbury, Christchurch, New Zealand |

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<tr>
<th>Class 7: Artistic Microscopy - Color Only</th>
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| **1st Place** – As-Cast Weld Deposit of 409 Stainless Steel Joint
Brian Rose, Arvin Meritor, Columbus, Idaho |
| **2nd Place** – As-Cast Weld Deposit of 409 Stainless Steel Joint Exhibiting Large Columnar Ferrite Grains
Brian Rose, Arvin Meritor, Columbus, Idaho |
| **3rd Place** – Austempered Ductile Iron
Janina M. Radzikowska, Foundry Research Institute, Krakow, Poland |
| **Honorable Mention** – Cementite Centurions
Janina M. Radzikowska, Foundry Research Institute, Krakow, Poland |

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<th>Class 8: Artistic Microscopy - Black and White Only</th>
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| **2nd Place** – Martin Sighting
Brian Rose, Arvin Meritor, Columbus, Idaho |
| **2nd Place** – Frozen in Time
Michael L. Morgan, Arvin Meritor, Columbus, Idaho |

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<tr>
<th>Class 9: Undergraduate Student Entries - Metals and Metal Alloys Only</th>
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| **1st Place** – Microstructural Development of an AISI 1080 to 316L Stainless Steel Functionally Graded Joint Processed with Laser Engineered Net Shaping (LENS)
Jeff Farren, Lehigh University, Bethlehem, Pa. |
| **3rd Place** – “Fishing in the Hole” In-situ Focused Beam Liftout for Transmission Electron Microscopic Analysis

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<tr>
<th>Class 10: Undergraduate Student Entries - All Other Engineering Materials</th>
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| **2nd Place** – Continuously Increasing Applied Voltage to the Electrospinning of Polycaprolactone (PCL) for Bone Tissue Reconstruction
Victoria Tran and Prof. Changmo Sung, University of Massachusetts, Lowell, Lowell, Mass. |
| **2nd Place** – Effects of Polymer Concentration in Electrospinning of PANI/PMMMA Blends
Kareem Reda, Keyur Desai and Changmo Sung, University of Massachusetts, Lowell, Lowell, Mass. |

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<th>Class 11: Digital Microscopy - Artistic</th>
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<th>Class 12: DuBoise-Crouse Award</th>
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| **DuBoise-Crouse Award** – Metallographic Examination of Structural Steel from the World Trade Center
George F. Vander Voort, Buehler Ltd., Lake Bluff, Ill. |
36th Annual IMS Convention Highlights

Sidnei Paciornik and Guillermo Solórzano, professors at the Pontificia Universidade Católica in Rio de Janeiro.

Close-up view of the Alamo monument.

The Jim Callum Band at Callum’s Landing on the River Walk.

George Vander Voort presents Enrica Stagno’s Sorby lecture.

Barry Jenkins, Juan Asensio-Lozano and Ana Luiza Rocha enjoy lunch at Zuni’s on the River Walk.

The Small World performing at Callum’s Landing, a favorite place for IMS members.

IMS Board and judges enjoying dinner on the San Antonio River.

Side view of IMS members having dinner on the San Antonio River.
San Antonio · Aug. 3-7, 2003

View of the River Walk near the Marriott.

Richard Blackwell at the floating Board judges dinner on the River Walk.

View of the River Walk at night.

Allan Lockley at the podium during the IMS Banquet.

Dennis Hetzner during his short course on Sunday.

Arlan Benscoter and Nat Saenz shaking hands at the IMS Banquet.

Overhead view of IMS members enjoying dinner on the San Antonio River.

Scenic bridge along the River Walk.
First Announcement:
37th Annual International Metallographic Society Convention
Aug. 1-5, 2004 • Savannah, Ga.

By Elliot A. Clark, IMS 2004 General Program Chair

Planning is well underway for the 37th International Metallographic Society (IMS) Convention, which will take place as part of the Microscopy and Microanalysis Meeting, Aug. 1-5, 2004, in beautiful Savannah, Ga.


IMS sponsored short courses being held Sunday, Aug. 1, will include: “The Reflected Light Microscope (Metallograph) - Understanding the Basics and Optimizing Results” (half-day) and “Modern Practice in Metallurgical and Materials Failure Analysis” (full-day). In addition, the 2004 International Metallographic Contest will continue as one of the society’s great traditions.

Detailed information about all the activities of the annual meeting will be presented in the official Call for Papers, which all IMS members will receive by mail in November. Instructions for submission of papers to the various symposia, general meeting registration information and forms will also be included in the mailing. I look forward to seeing you in Savannah!

News Release Spotlights

FEI launches Truelmage software for quantitative structural analysis at sub-angstrom level

FEI announced the introduction of a unique software package that enables the company’s Tecnai FEG microscopes to yield quantitative structural information with high precision at the ultimate resolution limit of the microscope.

Developed by FEI in co-operation with Philips Research Laboratories and Forschungszentrum Julich, Truelmage software brings unprecedented value to fundamental materials research by giving a true representation of what the atomic structure of materials look like. Truelmage enhances the directly interpretable resolution of high-resolution TEMS. Clearer, high-precision data on quantitative images with feature delocalisation are obtained so that researchers can better understand material structures.

FEI is a nanotechnology company providing 3D structural process management solutions to the world’s technology leaders in the fields of semiconductors, data storage, structural biology and industry. For more information, visit www.feicompany.com.

LECO introduces new AMH43-Series Hardness Testing System

LECO Corp. introduced the new AMH43-Series Hardness Testing System from its metallographic product line. This semi- or fully automatic system is marked by a patent-pending “visual method” that allows users to position indents and patterns directly on an overview image of the sample materials as a single “panoptic view.”

The overview is automatically constructed as the operating software traces the outline of the sample (or as the user explores the sample). Shape, location and estimated size of each indent are shown prior to indentation, helping the user avoid surface imperfections. The software also features a configurable user interface, report designer and optional macro language.

LECO is a provider of technologically advanced analytical instruments and metallographic products. For more information, visit www.leco.com.

Member News

George Vander Voort visited Len Samuels and his wife, during a trip to Melbourne, Australia, last February and celebrated Len’s 81st birthday. (Last year, George Vander Voort ran a symposium on metallographic specimen preparation in honor of his 80th birthday.)

Len is a long time IMS member and supporter, as well as the 1980 recipient of the Henry Clifton Sorby Award. He is also the author of Metallographic Polishing by Mechanical Methods, 4th Edition. Currently, Len is experiencing some walking problems and is undergoing physical therapy. Pat is having some difficulties with osteoporosis. We wish them both well!

From left: Len, George, Pat and Brad Dulmane of Carpenter Technology Corp. celebrate the occasion with a bottle of DeBortoli wine.
Q: Any suggestions for a macroetch recipe to reveal forging flow lines on a FV535 steel as-forged blade? I consider the actual surface finish to be fine enough to do it without sectioning (also because the blade airfoil is too thin to make a longitudinal section). The material chemistry is: 9.8-11.2 Cr, 5.0-7.0 Co, 0.5-1.0 Mo, 0.6-1.15 Mn, 0.2-0.45 Nb, 0.2-0.8 Ni, 0.1-0.7 Si, 0.1-0.35 V, 0.06-0.11 C, balance Fe. Thank you. – EDFA: Make a dummy mount with a thermoplastic resin commonly known as lucite. Cut off a round slice (maybe 3/8 of an in. thick). Poke a hole with a hot wire measuring a little thicker than the sample through this slice. You can also drill a hole. Now, insert the wire sample through this hole and place the slice back into the mounting press. You can ground off the circumference of the slice a tad in case you cannot insert it into the mold. The wire sample should be as long as the thickness of the slice. Fill in additional lucite powder and proceed as if you were mounting a new specimen. Since lucite is a thermoplastic resin as opposed to bakelite, it will fuse the powder and the slice with the wire together. – Sarup Chopra (a visitor and frequent contributor)

A: We routinely make transverse cross sections of wire as small as .005” diameter using thermostetting resins in a mounting press. Here is the technique: Make a wafer by pouring some of the resin (not as much as you would use for a regular mount) into the press and pressurize it without heat or with just enough heat to hold the wafer together. Do not cook it for more than a minute or two from room temp. Then eject the wafer. Carefully grind down the periphery so the wafer will be small enough to fit back in the press later. Then, with a pencil, draw a line across the top and bottom of the wafer. Make sure the lines are in the same place on both sides. Lay your wire samples perpendicular to and across the line, put the wafer back in the press, cover it with more resin to the appropriate depth. Process the mount as usual. Eject the finished mount from the press, cut it in half on the line, and you will have cross sections of your wire. – Jeff Stewart

Q: I do not have a microhardness tester so I am attempting to measure the case depth by micro examination. I am using 2 & 5% nital for etching carburized steels. Is there any other etchant that will reveal the case depth better? Please mention the etching time. – Iathamisha

A: Nital usually does a good job on case depth. Without any details it is hard to suggest another etch. I have used picral, which does not darken as-quenched martensite, but will darken tempered martensite. I have also used 10g sodium metabisulphite in 100 mL water, which colors the various constituents. Etch time cannot be stated as gospel. This is empirical, and must be determined by trial and error. – George Vander Voort

A: A 2-5% nital etch is commonly used to reveal a case depth in carburized steel. The other etchant that might produce better results is Villetta’s reagent which consists of 200mL ethanol, 20mL hydrochloric acid and 8 grams of picric acid. I suggest etching by immersion. – George Blann

A: Try this: 1) 50 mL HNO₃ + 5g (NH₄)₂S₂O₇ - 10 s. Wash in water with cotton. 2) Nital 10%. This etch shows the diffusion layer in CrNiMo steel. – E.R. Almeida (a visitor and frequent contributor)

Q: Do you have any suggestions about how to get a good cross section of .011” diameter wire? Metal clips trap etchant and lube. My plastic stands are not tight enough to hold .011” wire. I have never tried hot mounting wax or maybe sample bonding glue. – Cathy Morton

A: Voltage is too low for the amperage. Try 35 volts DC, & about 3/4 amp for 20 s. That will give you a starting point. Make very certain you etch it right after polishing. Sensitive tint will help when viewing. You might also try Keller’s reagent. – Mike Miller
Ask The Experts - continued

A: Here are the parameters under which Barker’s works day in and day out for us:

Specimen has a 0.05 micron polished finish; specimen’s surface is the anode; 30 V DC, 1.2 amp at the beginning, it will decrease to 0.2 amp on its own; 2 min.; stainless steel cathode. The biggest difference is that we use a polisher/etcher that has a pump that pushes fresh Barker’s up to the specimen. If Tom can have his bath of Barker’s agitated it may give him more consistent results. This is important because this is an anodizing process, it deposits a film, instead of a etching process where materials is being removed. – Gabe Lucas

A: We may have to back up to the preparation first. Is the surface “clean” enough for successful working? Al alloys require final polishing with submicron colloidal silica. – Judy Arner

Crystallography Scholarship Awards

To encourage promising graduate students to pursue crystallography-oriented research, the International Centre for Diffraction Data (ICDD) has established the Ludo Frelv Crystallography Scholarship Fund. Multiple recipients are selected on a competitive basis, each receiving an award of $2,250.

Applicant qualifications: The applicant should be enrolled in a graduate degree program during the 2004 calendar year with major interest in crystallography, e.g. crystal structure analysis, crystal morphology, modulated structures, correlation of atomic structure with physical properties, systematic classification of crystal structures, phase identification and materials characterization. There are no restrictions on country, race, age or sex. The term of the scholarship is one year.

Application requirements:

- Curriculum vitae, listing degree(s) held and degree(s) sought.
- A one-page summary by the graduate student describing the type of crystallographic research being pursued in satisfying the requirements of an advanced degree and the applicant’s expected date of graduation.
- A supportive letter from the sponsoring professor of an accredited university or an institute of technology on institutional letterhead.

Applications should be mail to Scholarship Committee, c/o Corporate Secretary, International Centre for Diffraction Data, 12 Campus Blvd., Newtown Square, Pa., 19073-3273 and must be received by Oct. 31, 2003.

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Interesting Articles You May Have Missed

The following articles of interest to metallurgists appeared in recent issues of ASM publications.

In Practical Failure Analysis:

- “Remote Operations – A Rescuer’s Perspective on World Trade Center Disaster Recovery,” June issue, p. 9, Frank Heckendorn
- “Biologically Induced Corrosion and Consequent Failure of a Pump Shaft Coupling,” August issue, p. 63, T. Jur

In Advanced Materials & Processes:

- “Fracto-Graphic Features in Metals and Plastics,” August issue, p. 37, Ronald J. Parrington
Member Spotlight:
Rick Noecker wins Jacquet-Lucas Award for second year in a row

Fredrick (Rick) Franklin Noecker, II is this year’s recipient of the Best in Show Jacquet-Lucas Award for his winning entry entitled “Effect of Homogenization Heat Treatment on Critical Pitting Temperature and Sigma Phase Formation in Super Duplex Stainless Steel.” Noecker also received the 2002 Jacquet-Lucas Award for his entry “Cracking Susceptibility of AISI 1013 Steel-Copper Alloys.” We congratulate Noecker on his continued achievements!

About the winner: Rick Noecker graduated with honors from Lehigh University in 1996 with a bachelor’s of science in materials science and engineering. He also completed AFROTC at Lehigh and was commissioned as a second lieutenant in the U.S. Air Force. Noecker served for five years on active duty, where he worked as an aircraft maintenance and aircraft munitions maintenance officer. His experience includes the B-2 stealth bomber, nuclear weapons and conventional munitions. In August 2001, Noecker returned to Lehigh to pursue a master’s of science degree with an emphasis in physical metallurgy and free form fabrication using the Laser Engineered Net Shaping (LENS) process.

Currently, Noecker is a doctoral candidate and research assistant for Prof. John DuPont, as well as a NSF fellowship recipient. His current research interests involve the use of LENS to produce functionally graded H-13 tool steel-copper alloys. Noecker plans to earn a Ph.D. in materials science and engineering with an emphasis in bio-applications of materials.