Researchers in Germany have used a modern medical procedure to uncover a secret within one of ancient Egypt's most treasured artworks – the bust of Nefertiti has two faces. The differences between the faces, though slight, suggest to Dr. Alexander Huppertz, director of the Imaging Science Institute at Berlin's Charite hospital and medical school, that someone expressly ordered the adjustments between stone and stucco when royal sculptors immortalized the wife of Pharaoh Akhenaten 3,300 years ago. (Photo/Radiological Society of North America)

The Nefertiti bust consists of a limestone core covered in layers of stucco of varying thickness. Dr. Huppertz and colleagues used a 64-section spiral CT technique with submillimeter section thickness to examine the bust and assess its conservation status, gain information on its creation, and provide a 3-D surface reformation of the inner limestone sculpture.

The results showed that a multi-step process was used to create the sculpture. The stucco layer on the face and ears is very thin, but the rear part of the reconstructed crown contains two thick stucco layers. CT images showed several fissures and non-uniform bonding between the layers. The inner limestone face was delicately sculpted and highly symmetric. Compared to the outer stucco face, the inner face exhibited some differences – less depth in the corners of the eyelids, creases around the corner of the mouth and cheeks, less prominent cheekbones and a slight bump on the ridge of the nose. The ears on the inner sculpture were similar to those visible on the exterior.

Thin-section CT was able to provide detailed images of the inner structure in a completely nondestructive manner and showed the limestone core to be not just a mold, but a skillfully rendered work of art. Retouching the creases in the corners of the mouth and smoothing the bump on the nose on the outer face may have been the artist's choice and reflective of the aesthetic ideals of that era.

The Nefertiti bust is part of the collection of the Egyptian Museum of Berlin and will be moved in October 2009 to the recently restored New Museum in the historical center of Berlin. The full study was published in the April 2009 issue of Radiology.

For more information: Radiological Society of North America, www.rsna.org

A 21st century interpretation of a 20th century fashion

The latest object created by designers Ronan and Erwan Bouroullec in cooperation with Vitra, the Swiss furniture manufacturer, is called Vegetal and is inspired by the gardening fashion in North America in the early 20th century of systematically pruning and painstaking training young trees to grow in the shape of chair-like structures. The central element of the Vegetal chair is a seat shell that looks like branches of different thicknesses woven together.

The weather-resistant designer chair called for a reinforced polyamide that could be fabricated by means of gas injection technology (GIT) and could easily be dyed in the desired earth colors. GIT allows the manufacture of very lightweight, stable plastic parts. After the classic injection-molding process, compressed air blasts the not-yet hardened plastic out of certain portions of the chair structures, making the four legs and part of the seat shell of the Vegetal chair hollow. As a result, the chair weighs a mere 5.5 kg. The seat shell and the two front legs are formed in a single processing step while the two rear legs follow in a second step.

Fabricating a GIT part of this size in these colors posed a challenge for the injection molding processor as well as for BASF Leuna GmbH, the producer of the plastic, Miramid. BASF’s Miramid engineering plastics are optimized for GIT and meet stringent surface quality requirements, even in special colorations.

For more information: www.designfabrik.basf.com, www.basf.com