Argonne NATIONAL LABORATORY

# Uwe Bergmann

## "Secrets in the Ancient Goatskin: X-rays Reveal Archimedes' Oldest Writings"

Archimedes of Syracuse (287–212 B.C.) is considered one of the most brilliant thinkers of all time. The tenth-century parchment document known as the Archimedes Palimpsest is by far the oldest surviving manuscript containing works of Archimedes. It is also the unique source for three of the Greek's treatises; the "Stomachion," "The Method of Mechanical Theorems," and the Greek version of "On Floating Bodies." The privately owned palimpsest is the subject of an integrated campaign of conservation, imaging, and scholarship being undertaken at the Walters Art Museum in Baltimore. Much of the text has been imaged by various optical techniques, but significant gaps in our knowledge of the writings of Archimedes remained. A breakthrough in uncovering the missing Archimedes writings was achieved at the Stanford Synchrotron Radiation Laboratory. Using x-ray fluorescence imaging, writings from faint traces of the partly erased iron gall ink were brought to light. The x-ray image revealed Archimedes writings from some of his most important works covered by twelfth-century biblical texts and twentieth-century gold forgeries. This talk will focus on the fascinating journey of a 1,000-year-old parchment from its origin in the Mediterranean city of Constantinople to an x-ray beamline at the Stanford Linear Accelerator Center.

**Uwe Bergmann** received his Ph.D. in physics in 1994 at the State University of New York at Stony Brook. He was a postdoc at the European Synchrotron Radiation Facility and a Postdoctoral Fellow at the Lawrence Berkeley National Laboratory, where he was appointed to a scientific position in 1999. In 2000 he became an Assistant Researcher in the Department of Applied Science at the University of California, Davis. In 2003, he was named a Staff Scientist at the Stanford Synchrotron Radiation Laboratory and, in 2007, a Senior Staff Scientist at SLAC. His research interests include the development and application of novel synchrotron-based hard x-ray spectroscopic techniques including nuclear resonant scattering, non-resonant x-ray Raman scattering, resonant inelastic x-ray scattering, x-ray emission spectroscopy, selective x-ray absorption spectroscopy, and x-ray fluorescence imaging as they pertain to applications such metalloproteins in biocatalysis; 3d transition metal compounds; water and aqueous solutions; hydrocarbons and fossil fuels; and ancient manuscripts, fossils, and brain sections.

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## 3:00 p.m.

Bldg. 402 · APS Auditorium
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# APS Colloquium