Carnegie Mellon
Materials Science and Engineering Seminar Series:

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"Metallic Nanostructures Characterized by 3-D Atom Probe"

Friday, December 2, 2005
10:30 A.M. Refreshments, 11:00 A.M. Seminar
Singleton Room, Roberts Engineering Hall (REH)

Unconventional mechanical and magnetic properties are often reported for materials with a microstructure dimension of less than 100 nm. To develop new nanostructured materials with improved properties, it is important to understand the structure-property relationships. In this talk, we will give an overview of our recent studies on the structure-property relationships of various metallic nanostructures that were processed by the crystallization of amorphous precursors or mechanical milling. The three-dimensional atom probe (3DAP), which can map alloying elements in a three dimensional real space with a near atomic resolution, was mainly employed for the characterization of metallic nanostructures. We will demonstrate how the 3DAP can be used to obtain critical information on the mechanism of nanocrystalline microstructure evolution by reviewing our recent studies on two phase metallic glasses and nanocrystalline steel.

Kazuhiro Hono received a B.S. and M.S. in Materials Science from Tohoku University in 1982 and 1984, respectively, and a Ph.D. in Metals Science and Engineering from the Pennsylvania State University in 1988. Following post-doctoral research at Carnegie Mellon University in the Department of Materials Science and Engineering, he moved to the Institute for Materials Research at Tohoku University as a Research Associate in 1990. He moved to the National Research Institute for Metals (now National Institute for Materials Science) as a Senior Researcher and is now a Fellow of NIMS. He is also a Professor of the Materials Science Program at the Graduate School of Pure and Applied Science at the University of Tsukuba. His research interests include phase transformation in alloys, microstructure-property relationships of magnetic materials, nanocrystalline and amorphous alloys, atom probe field ion microscopy, and transmission electron microscopy.