



The Macrogram

Hartford Chapter of the ASM International
Build on our Strengths - Leverage our Diversity - Network to Succeed

MONTHLY MEETING – TOPIC

March 14, 2006 – Past Chairs' Night

Topic: Nitinol Applications in Medical Devices and Implants

Speaker: Dr. Ming H. Wu
Vice President Technology
Memry Corporation - Bethel, CT
(<http://www.memry.com/>)

Directions: Cugino's, 1076 Main Street, Newington, CT 06111, Ph: (860) 665-0881 Main Street is Route 176. **Cugino's** is south of Route 175 (Cedar Street). Use alleyway to parking area in rear.

Agenda:	Program Charges:
Cocktails: 5:30-6:30 PM	Regular Members - \$28.00
Dinner: 6:30 7:30 PM	Retirees - \$15.00
Program: 7:30- 8:30 PM	Full Time Students - \$15.00

Technical Chairperson: Harley Graime
Reservations: Call Shirley at Dynamic Metals (860) 583-3336 by noon March 10th. **Thanks!**

Abstract:

While alloys having the ability to change shape fascinated many scientists, successful commercial applications did not emerge until after the discovery of Nitinol at the Naval Ordnance Laboratory in the early 1960's. Early uses of Nitinol started in aerospace, industrial and commercial applications. Examples were hydraulic fluid couplings, connectors and actuators for safety valves.

In more recent decades, many minimally invasive and percutaneous interventional medical procedures were being revolutionized by superelastic Nitinol. The enormous flexibility and kink-resistance allow a Nitinol device to be deployed through a small incision and while reaching the intended anatomic site the device can be released to regain its original shape of a larger dimension. The stress plateau developed during the deformation of superelastic Nitinol also provides a well-controlled contact stress between tissues and the device. Well known dental and medical applications include orthodontic appliances, medical guidewires, minimally invasive surgical instruments, orthopedic components, stents and thin-film mini-pumps for drug delivery.



The presentation will review alloy properties, processing method and the working principles of various exemplary applications. It is anticipated that Nitinol will continue to drive medical device innovations in minimally invasive surgeries and percutaneous interventional procedures in the near future.

Bio:



Dr. Wu was employed by Memry Corporation in 1986 as Metallurgist and promoted in 1998 to Vice President and General Manager, Eastern Operations. From 1987 through 1996, he served as Chief Metallurgist. From 1996 through 1998, Dr. Wu was Director of Engineering, and in 1998 served as Vice President of Engineering for Eastern Operations.

Dr. Wu is a member of the American Society of Materials (ASM), the American Society for Testing and Materials (ASTM) and Shape Memory and Superelastic Technologies association (SMST). In addition to these affiliations Dr. Wu is a Member of the Board of Directors & Conference Organizing Committee – International Conferences on SMST (Shape Memory and Superelastic Technologies), an organizing committee member – ASM Materials & Processes for Medical Devices Conference, and Committee Member – ASTM Medical NiTi Material Specification and Testing Subcommittee. Dr. Wu also served as an Advisory Board Member & Adjunct Professor – Materials Science Program, Fairfield University. Dr. Wu was Adjunct Research Professor at Naval Postgraduate School in Monterey, California where he studied phase transformations in high-damping Mn-Cu alloys.

Dr. Wu holds an MS and a Ph.D. in Materials Science and Engineering from the University of Illinois-Champaign-Urbana, where he studied bainitic and martensitic transformations in Ag-Cd and Cu-Zn-Al shape memory alloys. He graduated with a B.S. in Materials Science and Engineering from National Tsinghua University Taiwan in 1977. Dr. Wu has had about 40 publications in scientific journals and conference proceedings and is a regular participant in conference presentations including invited presentations at various conferences, research institutes and universities. He has numerous issued patents and a number more in pending status.