ASM - Atlanta

Newsletter of the Atlanta Chapter of ASM International
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April Meeting of the Atlanta Chapter of ASM

Tuesday Evening, April 16, 2002
At the Georgia Tech Ferst Place Cafeteria,

Advances in Microanalytical Techniques for Chemical Mapping

presented by

Dr. Kathleen B. Alexander

Los Alamos National Laboratory
and ASM International Trustee
Dr. Alexander will also address current ASM chapter developments

also

Fatigue Crack Growth Behavior & Probabilistic Life Prediction in a DS Superalloy

by **Shelby Highsmith**

A 10-minute Ph.D. graduate student presentation
School of Materials Science & Engineering, Georgia Institute of Technology

Tuesday Evening, April 16, 2002
Please Note the Earlier Time Schedule

Wine Reception & Social:	**6:00 PM**
Dinner:	**6:30 PM**
Introductions & Business:	**7:15 PM**
Student Presentation:	**7:30** PM
Dr. Alexander's Presentation:	**7:45 PM**

Costs: $**20.00** Regular, $**6.00** Students

Dinner **MENU:** Mexican dinner **South of the border (chicken Fajita)**
Dessert bars: caramel apple, pecan chocolate chunk, chocolate raspberry and lemon. Iced tea & Coffee
Vegetarian dinner available upon request. Wine - extra charge

WHERE -- Georgia Tech Ferst Place Cafeteria, 3rd floor of Student Center Building (next to the campanile). Parking is available at the Student Center visitor parking lot off Ferst Drive.

Reservations: RSVP - by noon on Monday, April 15, to Marlene White, Tel: (404) 894-2850, Fax: (404) 294-9140, marlene.white@mse.gatech.edu

Note: If it is necessary for you to eat elsewhere, please know that you are very welcome for the program. Come & meet with your technical friends and make new ones.

Abstracts & Speaker Information

Advances in Microanalytical Techniques for Chemical Mapping: Recent advances in a variety of technologies have contributed to the development of high spatial resolution techniques for mapping the distribution of chemical species in materials. For example, the use of field emission guns in electron microscopes have enabled higher current densities in smaller probes. In addition, advances in energy-filtered imaging in the electron microscope and automated beam control have allowed techniques such as spectrum imaging to becoming much more wide spread. Chemical mapping using scanning electron, transmission electron and atom probe field ion microscopy techniques will be shown. Materials science examples will be drawn from a variety of materials including nickel-based superalloys, ceramic composites, and oxide scales formed on high temperature alloys.

Dr. Kathleen B. Alexander, FASM, is deputy.group leader of the Structure/Property Relations Group in the Materials Science and Technology Division, Los Alamos National Laboratory. She holds bachelors, masters, and Ph.D. degrees from Carnegie-Mellon University.

In 1985, Dr. Alexander was named a NATO postdoctoral research fellow to perform research at the University of Cambridge, Cambridge, England. She joined Oak Ridge National Laboratory (ORNL) as a research staff member in 1987, where she worked in both the Microscopy and Microanalytical Sciences and Structural Ceramics Groups. In 1994 she was named Group Leader of the Microscopy and Microanalytical Sciences Group and supervised the Shared Research Equipment User Program and Facility. Her research interests are in the micro-structural characterization and design of ceramics, phase transformations in metals and ceramics, as well as in oxidation processes of high temperature intermetallic alloys and nickel-based superalloys. She has published over 100 publications and been granted two patents.

Dr. Alexander began her involvement with ASM in high school when she was awarded the Gilbert Soler Scholarship by the Golden Triangle Chapter for her undergraduate studies. She joined ASM in 1987 and was elected a Fellow in 1996. She was chapter chair of the Oak Ridge Chapter. She was a member of the PRISM (Professional as Resources for Instructors of Science and Math) Focus Group. She is currently on the Editorial Board for Advanced Materials & Processes and a member of the Action-in-Education Team.

Dr. Alexander is also currently on the Executive Council of the Microscopy Society of America as Society Treasurer. In 1997, she was honored as one of Ten Outstanding Young Americans by the United States Junior Chamber of Commerce for her research and education outreach efforts.

Fatigue Crack Growth Behavior & Probabilistic Life Prediction in a DS Superalloy: Power generation capacity and efficiency of industrial turbine generators are a strong function of maximum turbine inlet temperature and, consequently, the capability of component materials to withstand high thermomechanical stresses. Directionally solidified (DS) and single crystal (SC) nickel-base superalloys are utilized in the blades of turbine rotors because of their combination of high strength, high toughness, and resistance to creep. Part of the life prediction of these components involves analyzing the growth of subcritical cracks under cyclic thermal and mechanical stresses. Due to the highly heterogeneous nature of these materials compared to conventional, equiaxed, fine-grain alloys, subcritical crack behavior can be fairly erratic, and therefore a probabilistic approach to fatigue crack life prediction should be utilized. This presentation describes a baseline materials characterization and life prediction program underway to study fatigue crack growth behavior in a DS superalloy and explore probabilistic models for life prediction.

Shelby Highsmith is a Graduate Researcher, in the Mechanical Properties Research Lab (MPRL) at Georgia Tech. He earned a B.A. in Philosophy and a B.S. in Aerospace Engineering at the University of Notre Dame in 1997. He spent over three years in Propulsion Technology Development at Honeywell Engines & Systems (formerly AlliedSignal Engines) working on prototype design, manufacturability, and durability testing for advanced military turbine engine hot section components, as well as serving with the company's accident investigation group. He returned to academia in January 2001 to work for Prof. W.S. Johnson in the MPRL as a Materials Science student.

Nominations for Officers of the Atlanta Chapter of ASM International for 2002-03

by **John Mihelich**

Chairman **Kim Spinsby** read the nominations for ASM officers at the March meeting and announced that others can be nominated from the floor at the April meeting when the elections are held. Here is the list of nominees for ASM Atlanta Chapter for 2002-2003. This slate of outstanding individuals was collected by your nominating committee of Bill Livesay, Naresh Thadhani and John Mihelich.

Steve Johnson:	**Chairman**
Janet Hampikian:	**Vice Chair, Academic & Programs**
George Kremer:	**Vice Chair Industry**
Subu Shanmugham:	**Treasurer**
Gautam Patel:	**Secretary**

Golf Outing in May

by **Karen Hutcheson**

The School of Materials Science and Engineering invites ASM members to join us and MSE alumni in a golf outing.

When: **Friday, May 10th**
11:00 **Lunch**
12:30 **T-Time**
4:30 **Social Hour**

Where: **Bobby Jones Golf Course**, Atlanta, Georgia

This should be a lot of great fun for all of us - and what a beautiful setting, particularly in May. **RSVP** to **Karen Hutcheson** by **April 30th**, 404-894-5823 karen.hutcheson@mse.gatech.edu**.** Cost is $55. Checks can be made out to Georgia Tech, MSE, sent to Karen Hutcheson, School of Materials Science and Engineering, Atlanta, GA 3033-0245.

Four GA Teachers Selected to Participate in ASM Materials Camp

Four Georgia High School teachers have been selected to participate in the first ever, all-expense-paid, weeklong, MATERIALS CAMP, sponsored by ASM International. The camp will be held at the University of Michigan from June 24 to June 29. It will include the participation of a total of 30 teachers, 12 of whom are from the state of Michigan. Amongst the non-Michigan teachers, Georgia has the highest representation.

The Georgia high school teachers are:
Christopher L. Neil: Lassiter H.S., Marietta
G**ary Loveless**: Central Gwinnett H.S., Lilburn
Sandra Peterson: Parkview H.S., Lilburn
Michael O'Brien: Kennesaw Mountain H.S.

The materials camp will provide hands-on laboratory experience to assist Teachers to use applied engineering techniques in the classroom. Emphasis will be on automotive issues and materials science engineering principles.

Participating teachers will leave with a comprehensive series of low/no cost laboratory demonstrations in applied science to use in chemistry, physics, math, technology, and industrial arts.

The ASM-Atlanta Chapter congratulates the teachers and looks forward to hearing from them about their experience at one of the meetings in the fall.

Six Flags "Behind the Ride" Tour on Tuesday, May 14th - at noon

A Joint Meeting of SME & ASM

A Dream-Come-True opportunity for those who always wanted to know just how these fantastic rides are designed, built and work.

We will tour the newest ride creation at Six Flags and be offered a close up view of the electrical and mechanical systems that make this sophisticated roller coaster a perfect match for our groups. Discussions will include the safety systems, operating controls, design and construction of rides and any questions you may have.

Regarding the reservations: please RSVP with SME Atlanta Chapter Chairman **Ben Harbin** at 770-455-0676 ext 121, or benh@t-tech.com, by Friday May 10th. We are asked to indicate that we are from ASM, and to state how many people we each will be bringing. If there are more than 50 RSVPs he will ask Six Flags to adjust for a few more visitors. They originally said they could handle up to 100 visitors, so Ben doesn't anticipate having too many RSVPs.

The SME & ASM members and guests will assemble at the Six Flag's employee entrance. From Atlanta, go west on I-20 past the usual entrance to the Park to exit 46A, Riverside Parkway. You will enter Riverside Parkway in the correct direction. After about a mile, turn left into the employee entrance (at 275 Riverside Parkway). Proceed to a stop sign and turn right to the six Flags Security Post.

ASM International Student Awards

by Professor **Naresh Thadhani**

ASM Atlanta Chapter Chairman, Kim Spinsby, will present the following two outstanding student awards during the Georgia Tech Awards Days Ceremony on April 16:

Atlanta Chapter of the ASM International Award to: **Gregory B. Kennedy** (Graduate), $250 check + $250 worth of ASM publications + certificate

Atlanta Chapter of the ASM International Award to: **Morgan D. Mager** (Undergraduate), - $250 worth of ASM publications + certificate,

Congratulations to both Greg and Morgan for the recognition of their outstanding work.

Atlanta Chapter Sustaining Memberships

Last month, we were pleased to announce our new Sustaining Member for the Atlanta Chapter of ASM International. **Metals & Materials Engineers**, (**MME**) formerly the Materials Engineering Division of QORE & Consulting Metallurgical Services is an ISO 17025 audited metallurgical and materials engineering laboratory and consulting firm. Specializing in failure prevention and assurance, the **MME** engineering and technical staff is positioned as one of the most well respected and capable groups of its kind in the nation and worldwide. MME Departments: Metallurgical Services, Forensic Engineering, Failure Analysis, Marine Forensics, Polymers, Product Testing, Ground Penetrating Radar.

Chromalloy Georgia became a **Chapter Sustaining Member** of our ASM-Atlanta Chapter during the spring of 2001.

Contact the Membership Committee Chair: **Dr. Jud Ready**, MicroCoating Technologies, 5315 Peachtree Industrial Blvd., Atlanta, GA, 30341, 678-287-3969; jready@microcoating.com. Your organization's commitment to this program will provide a valuable contribution to the education and development of young materials scientists and engineers.

- QUOTE OF THE DAY -

"Sometimes one pays most for the things one gets for nothing. If I had my life to live over again, I'd be a plumber." - **Albert Einstein**

Two Nano-Materials

Are Better Than One

Researchers say they have fabricated ultrasmall wires out of materials that previously could not be used together. The result, they say, represents a major advance in nanotechnology research and could move the sci-fi fantasy of ultrasmall supercomputers and microscopic electronic devices closer to reality.

University of California, Berkeley, chemist Peidong Yang says he made "superlattice" nanowire, a strand less than 100 nanometers in diameter, by alternating segments of silicon and silicon germanium. Yang "grew" the wire like a crystal, adding blocks of each material in turn as the structure formed.

"These are not materials you can bring together in a traditional semiconductor manufacturing environment," says Larry Bock, president and CEO of Nanosys Inc., a company he co-founded with Yang that's licensing the technology. "But when you operate down on this size scale, you don't have those surface tensions."

The result combines the best of both materials, and its composition can be customized for different functions. A nanowire can precisely control electrical current, emit light, heat or cool a device, or even store information. And the tiny wires can serve as components for more complicated devices, allowing engineers to build smaller and smaller electronic and optical hardware. - David M. Ewalt

Membership Committee

Jud Ready, Membership Committee Chairman for ASM-Atlanta, continues the process of reconciling the ASM-Atlanta membership database. Jud asks: Please help him by verifying that your information is complete and accurate. To verify and update your membership information, go to: **http://www.asm-intl.org/** & select "Site Login" then select "Update Your Membership Record"

Jud Ready, PhD, Research Scientist, MicroCoating Technologies, Inc., jready@microcoating.com
http://www.readymadeparties.com/jud

A Message for ASM Members Who May Be Without Jobs at the Moment

The current economic times are hard on many people, but we have discovered that ASM International, indeed, does look after it's own members. We are very pleased - and proud - to inform the ASM membership about a wonderful benefit available to ASM members who are unable to renew their membership due to change in work status. One of our members reported receiving a telephone call from Phil McNaughton, Sr. Service Representative @ASM International, who said his 2002 membership dues would be taken care of due to his unemployment situation. What a super benefit! If you know of ASM members in the Atlanta chapter who are currently experiencing a job situation and wish to continue their membership, please encourage them to inquire about this unique benefit.

Positions Available or Needed

VP of Engineering Wanted:
State-of-the-art Technology Company is in search of a VP of Engineering. We design, manufacture and market industry-leading devices and need a creative problem solver that can lead an engineering team from product design through manufacturing. This VP will also be a part of the Executive team that helps to decide the direction of the company. This is a very high profile position.

Requirements: Masters degree in Engineering (chemical or electrical) or related field. PhD preferred. Minimum of 10 years experience, preferably in engineering product management. Five additional years experience in project management positions preferred. Knowledge of methods used to research/analyze potential engineering/scientific solutions, develop test plans, and implement development/manufacturing projects.

Please send your resume in confidence to designmanufacture@yahoo.com.

Technical Sales Engineer:
ASM member desires a territory or regional technical sales position. Experience includes:

• Sales engineer professional with 16 years of territory management experience in the Southeast region selling industrial capital equipment and testing instrumentation products to OEM, government, academic, commercial testing, and research type organizations.
• B.S. in Chemical Engineering.
• Experience writing and negotiating contracts, performing product presentations, ability to develop and qualify new prospects, demonstrated proficiency with the entire sales process.
• Possess excellent business and analytical skills including developing strong customer relationships and conducting a thorough customer needs analysis.

To reach this individual, send a note to Newsletter Editor; Bill Livesay at livesay3@bellsouth.net, or call at 770-664-8742.

Atlanta SMTA EXPO & Technical Presentations

Note: Job Placement program at this Expo
April 18, 2002, Courses begin at 8:00 AM
EXPO: 10:00 AM - 4:00 PM
The Gwinnett Civic & Cultural Center
6400 Sugarloaf Parkway, Duluth, GA 30097
(109 Mile Marker, Exit 108) on I-85
West side of I-85
http://www.atlantasmta.com/news.html

Features of ASM-Atlanta

- Program Notes for Meetings
- Chairperson's note to members.
- Career Development: job opportunities or jobs needed
- Company Feature:
- Technical Features:
- Education Feature: Materials course offerings.
- Georgia Tech Student Chapter News
- Member News
  - Special Events, Awards & Honors.
  - New Members
  - Deaths
  - Transitions
- ASM International News
- Advertisements
- Outreach (ASM members to Schools, Scouts, etc.)

Note: If you do not also receive this newsletter via your email, it means we don't have your email address. Please address an

email message to livesay3@bellsouth.net and simply type ASM Newsletter in both subject and body. We eventually wish to migrate to much greater email distribution of the newsletter to help control costs. Thanks, BL.

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