



ASM - Atlanta

Newsletter of the Atlanta Chapter of ASM International

<http://www.asm-atlanta.org/> Meets 3rd Tuesday

February, 2001

Volume 7

Number 6

Meeting of the Atlanta Chapter of ASM

Tuesday Evening, February 20, 2001

PROGRAM

Georgia Industry Night

Presentations from representatives of several Key Georgia Industries

If you are not receiving this Newsletter via email, it is only because we don't know your email address. If NOT receiving the email version, please send an e-message to Bill Livesay at b.livesay@gtri.gatech.edu with one word, "ASM", as both the subject and body of the message. Ultimately, we would like the distribution to be nearly all email, but we currently have fewer than half of the membership's correct email addresses.

ASM Chapter Meeting

Tuesday Evening, February 20, 2001

Wine Reception & Social: 6:00 PM

Dinner: 7:00 PM

Introductions, Business: 7:50 PM

Presentations: 8:00 PM

Costs: \$20.00 Regular, \$6.00 Students

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.

Menu: Italian buffet with eclectic pasta and sausage with green peas, marinara and alfredo sauces, sauteed vegetable, garden salad and garlic rolls.

Reservations: RSVP - by 11:00 AM on Monday, February 19, to Marlene White,

Tel: (404) 894-2850, Fax: (404) 294-9140,

marlene.white@mse.gatech.edu

Note: A policy of ASM International is that one never pays to attend a regular Chapter meeting program. So, if you desire to eat elsewhere, you remain very welcome for the program.

The Industry Presentations

Southwire

David T. Lindsay presenting

With annual sales of \$1.4 billion, Southwire Company is one of the world's leading wire and cable manufacturers. Southwire technologies and products are distributed throughout the world. The company's products include building wire and cable, utility cable products, industrial power cable, copper and aluminum rod, cord products, communication cable and specialty products. Southwire also is a leading player in the research and development of high-temperature superconducting power cables. The company's world headquarters are in Carrollton, Ga.

David T. Lindsay graduated from the Georgia Institute of Technology in June, 1996 with a Bachelor of Materials Engineering. While in school, David co-op-ed with Southwire Company where he worked in a polymer R&D lab. After graduation, he spent two years working for

Sony Electronics in the area of magnetic tape. His responsibilities included technical support for production, technical interface for all raw material suppliers, and materials related product development for North America. He re-joined Southwire Company in 1998 as a Development Engineer where he has been working on new product designs and manufacturing processes. For the past two years, he has been a member of the superconductivity team at Southwire where he has assisted in the successful installation and startup of the world's first HTS Cable System to supply power to an industrial customer. He continues to work on HTS development and design issues.

Consolidated Engineering Company

Jim Lewis presenting

Mr. Jim Lewis graduated Georgia Tech ('93) with a BME focusing on mechanical systems and materials, and is a current member of ASM. His experience and background includes metals recycling, direct iron reduction, and heat process equipment. He currently directs research and product development for Consolidated Engineering Company (CEC) in Kennesaw GA, which targets the metal casting industries with various patented processes. Areas of development have included fluid bed processing of castings, accelerated sand mold/core decomposition, shorter cycle aluminum heat treatment, and engineered quench systems. Mr. Lewis resides in Kennesaw with his wife and two daughters.

Jim Lewis, R&D Manager, CEC - Kennesaw GA
770-422-5100, x135

Chromalloy Georgia

Ray Woody presenting

Chromalloy Georgia is one in the family of Chromalloy companies that form Chromalloy Gas Turbine Corporation (CGTC). CGTC is predominantly an aerospace company and is a wholly owned subsidiary of Sequa Corp. CGTC manufactures & repairs aircraft engine parts for many commercial airlines. It also works on land based gas turbines. Ray Woody, marketing manager for Chromalloy Gas Turbine Corporation, will give a presentation on the details of CGTC. He is an Alumnus of GA Tech. He graduated with BS in Aeronautical Engineering from GA Tech in 1975. He also has an MBA from Georgia State University (1979). He has been with CGTC since 1989.

Siemens

Kim Spinsby, presenting

Siemens has been a company for over 150 years, with nearly 447,000 employees in over 190 countries. Nearly 50,000 employees are engaged in R&D worldwide. Company products include: Communications, Automation & Control, Power, Solar Cells, Transportation - Heavy

Rail, Medical – Imaging and Lighting. Siemens Solar Industries (SSI) is the world's highest-volume producer of solar cells, with more than 20% of the market. SSI was first to produce 12.1% efficient large area thin film modules in 1999. Siemens generates about 75% of sales with products and solutions developed within the last five years. During fiscal 2000, Siemens researchers turned out 8,200 inventions - **an average of 33 per working day** and 10% more than the previous year. Today, 60% of the workforce is located outside Germany.

Kim Spinsby is CAD/CAE/Design Coordinator at Siemens, where he has worked for 8 years in the Siemens Energy & Automation Industrial Systems and Services Division.

ASM Materials Camp

by **Kim Spinsby**, VP Atlanta ASM Chapter

On behalf of the Atlanta Chapter of ASM International, I ask all members for assistance in identifying as candidates, junior or senior high school students, who are interested in attending the Materials Science Camp, from 13-19 August, 2001, held at ASM's new \$3 million Training Center in Materials Park, located in NE Ohio. The Atlanta ASM Chapter has been asked again to nominate a student to attend this gathering of the "best and brightest".

This is an unbelievable opportunity to get introduced to materials sciences with instruction and coaching from some of the best in the world. The lab at Materials Park has equipment that would be envied by many ASM members. All expenses; (tuition, travel, hotel, meals, etc.) will be paid by the ASM International Foundation. The students last year celebrated their graduation in a joint meeting with the ASM leadership weekend participant & the ASM Foundation directors. (see <http://www.asminternational.org/foundation>)

The student must have demonstrated an interest in science or engineering, completed course-work in advanced math, basic chemistry, physics, and earth science. Rising high school seniors preferred, but rising juniors are considered.

Last year, the Atlanta Chapter was represented by Kimberly Liverpool, then a rising junior in the Magnet School program of Columbia HS in Decatur. She reported on her exciting experiences at Materials Camp to the Atlanta ASM membership during a Fall chapter meeting.

Please do not hesitate to contact me, should you have any questions or need more information about the Materials Camp, or need an application form (see page 7). **Applications are due at ASM-Atlanta Chapter by the 1st of March, 2001.** A chapter committee will then review all applications and submit their nominee to ASM

International by 15 March 2001. A maximum of 30 students, overall, will be accepted for this program.

Please duplicate and forward this information high school teachers, or send copies with your children or grandchildren to their science and math teachers. Find the Material's Camp application form printed on page 7.

Time is very short!

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Acoustic Micro Imaging

Generation of an Acoustic Solid™

by Dr. Lawrence Kessler and Tom Adams

Editor's note: **Dr. Lawrence Kessler** is the founder of **SonoScan, Inc.** Your editor came to know him during a number of technical conferences and other visits over the last couple of decades. His instrumentation and techniques for acoustical imaging of solids have become well known, particularly within the microelectronics industry. Dr. Kessler kindly agreed to provide the following tutorial about the techniques for generating an "Acoustic Solid", specially for *ASM-Atlanta*.

Acoustic micro imaging is well known for its ability to detect and image defects such as disbonds in parts particularly semiconductor components. But what the technology actually images is not simply gaps, such as disbonds (although these are important), but internal material interfaces. This gives it the power to image well bonded interfaces. And although the use of acoustic micro imaging, or AMI, is widespread in microelectronics, it is also commonly employed in many other materials applications.

The part shown here (in a 3-dimensional acoustic image) is a metal matrix composite tensile test bar. This type of acoustic image is called an Acoustic Solid™. An acoustic solid contains information about the entire volume of the part, and can be rotated and sectioned (virtually, that is) to expose interior acoustic views.

QuickTime™ and a
Photo - JPEG decompressor
are needed to see this picture.

Figure 1. Rotated and then sectioned, this Acoustic Solid of a metal composite tensile test bar reveals internal voids (small dark features).

An acoustic solid is constructed from a sequence of planar acoustic micro imaging system from SonoScan 2-dimensional acoustic images made with a C-SAM®

(www.sonoscan.com). Let's look first how a planar acoustic image is made.

Unless it is entirely homogeneous, a part or sample has internal material interfaces where materials are bonded to each other. The very high frequency ultrasound used in C-SAM ranges from 10 MHz to above 200 MHz in frequency. The ultrasound is pulsed into a surface of the part by a scanning transducer.

Internal material interfaces reflect some portion of the ultrasound back to the transducer. Each of the two materials at an interface has an acoustic impedance value, which is the product of the material's density and the speed of ultrasound through that material. The value of the difference in acoustic impedance values between the two materials determines the degree of reflection. Since reflection is not normally 100% at a given interface, ultrasound can penetrate through, and image, several layers of material.

The "reflection exception" is any interface containing a gap such as a disbond, delamination, crack, or void. These gap-defects contain air or another gas. The resulting difference in acoustic impedance between the gas and any adjacent material is so huge that reflection is virtually total. Gap-type defects, in other words, are very easy to image acoustically.

The transducer pulsing ultrasound into the sample also receives the return echoes from various depths, and switches between pulsing and receiving several thousand times per second during scanning. Thus the transducer rapidly collects a large number of data points from which to assemble an acoustic image. Usually the return echoes are gated electronically to conform to a specified time window representing a depth of interest within the part. If you want to look acoustically at the internal interface between materials A and B, you set your gate at that depth, and both earlier and later echoes (from above and below that depth) are ignored.

Atlanta ASM Chairman's Message by John L. Mihelich

The Atlanta regional science museum, known to many of us as SciTrek, is in big financial trouble and may not survive. This museum is a great place for students to come and get an early exposure to science and technology as it applies in the real world. Visitors, most of which are children. It gives reinforcement to the information that the schools science programs have taught the youngsters. Industry, government and private citizens are being asked to step forward to lend financial assistance. You will recall that one of the Chapter's Education Outreach efforts working with a Georgia Tech student team designed a hands-on display to show the usefulness of materials in society. Prof. Steve Johnson, an ASM Atlanta Chapter member, was the facility advisor. That limited

An acoustic solid is made by starting at the top surface of the sample and scanning a number of thin planar images at increasing depths into the sample. The transducer is focused on each "slice," and the return echoes are gated on the slice as well. The number of slices is usually between 10 and 50. Some of the slices typically are at depths occupied by homogeneous material, and contain little or no data, but other slices encounter material interfaces. The slices are then assembled electronically into the acoustic solid, which appears on the screen as an opaque solid rectilinear object. Although it is originally opaque, it can be made translucent, and can be rotated and sectioned as desired.

A corner section has been removed from the tensile test bar shown here to reveal the small voids within the material. The voids are darker structures within the metallic composite, which would otherwise be completely homogeneous and lacking in internal acoustic features. Each void appears to extend vertically because it casts an acoustic shadow downward - that is, onto acoustic slices below the void. The total number of slices used to make this acoustic solid is 21.

Acoustic micro imaging is widely used to image and analyze metals, ceramics, and polymers. In addition to planar images and acoustic solids, there are several other modes, including Thru-Scan™ images, which create an acoustic shadow through the entire part to find gap-defects rapidly, and Q-BAM™, which creates a nondestructive cross-sectional view, analogous to physical sectioning of the part.

You can obtain further information about these techniques from: **Sonoscan, Inc.**, 2149 E. Pratt Blvd. Elk Grove Village IL 60007, Phone: 847 437-6400, Fax: 847 437-1550, e-mail: info@sonoscan.com

exposure was, according to Dr. Johnson, was a very positive experience looking to bring our materials discipline to the attention of students interested in science and technology. Your Executive Committee has been discussing what we might do to help SciTrek through this difficult time. We would encourage individual and corporate donations. We are also discussing making a contribution from the Chapters general fund. What do you think about a Chapter donation? Please contact one of the Executive Committee members, see contact information on the back page of this news letter and let us know what you think should be done.

We had super tour of the Lucent Technologies glass fiber and cable manufacturing facility in Norcross. Attendance was about 40 as that was the maximum number that the tour guides could handle. Dr. Bill Baron hosted the visit with a kick-off overview of the

operation and finished off the approximately 1 hour walkabout with a Q & A session. We all agreed that it was an outstanding event!

The Chapter's **Georgia Industry Night** is coming together quite nicely. We will have 4 speakers at the 20 February dinner meeting. They will be giving us an overview of their organizations and how materials scientists and engineers apply their trade. Following the presentations, the attendees will have an opportunity to meet with the speakers to discuss, in more detail, their company needs and employment opportunities. Come and hear about what leading manufacturers are doing with materials technology in our region of the country.

Please remember that we want to keep our meeting attendance up to a level of 30 attendees on a consistent bases. The Lucent tour is a prime example of a very desirable level of attendance. This was the second month in a row that we met the "30 minimum challenge"; We did it for our Holiday Bash in December, too. Our meetings and tours offer an excellent opportunity to network with your peers in the materials field. Great way to stay on top of what is happening in your field and on the local scene. See you, and bring a colleague along too, to the **Georgia Industry Night** on 20 February!

Georgia Tech ASM/TMS Student Chapter Update

by **Ben Church**, Student Chapter President

The Georgia Tech ASM/TMS student chapter has continued to grow this year. A special effort was placed on encouraging Freshmen MSE students to join professional societies such as ASM/TMS, AcerS, and MRS. The idea is simply to get new students involved earlier in order to give them more exposure to the exciting field of materials. This year the ASM/TMS chapter gained seven new freshmen student members - a new record. We are also continuing our outreach efforts this spring. The MSE Umbrella Society (ASM/TMS, AcerS, MRS, and Keramos) is trying to get funding for a new traveling experiment/display through a grant from ASM. This new display will allow students (K-12) to learn about material properties such as thermal and electrical conductivity and optical properties as well. Each property will be demonstrated through actual hands on experimentation. The ASM/TMS student web page, currently at www.cyberbuzz.gatech.edu/asm-tms, is undergoing renovation. After three years without updating, the page is full of bad links and other such faux-pas. Keep an eye on it over the next couple of months for new material and updated information.

Ben Church, ASM/TMS Student Chapter President
gte443r@prism.gatech.edu

ASM-Atlanta Web Site

Greg Kennedy, Chair
<http://www.asm-atlanta.org/>

Technical seminars, job openings, jobs needed & other issues occur at any time. The Atlanta Chapter of ASM maintains a web site that belongs to you, the Chapter membership. This web site can be a valuable and timely vehicle for sharing information. If you have an appropriate item for posting on the Atlanta ASM Web site, discuss it with **Greg Kennedy**, our Web Site Chair. Greg is currently taking significant steps towards redesigning the web site into, in his words, "a dynamic useful tool for chapter news and events". Reach Greg at: GA Tech, Atlanta GA, 30332 gte290r@prism.gatech.edu 404-894-1475V; 404-894-9140F

A Lightweight Materials Course for Atlanta?

by **Kim Spinsby**, VP Atlanta ASM Chapter

The Atlanta Chapter of ASM is planning on offering MEI courses to our members and the professional community again in the near future.

ASM-Detroit recently announced a six-week course on Lightweight Materials: Basics & Applications, spanning 6 weeks of one-evening meetings; each presented by a different local industry expert. See <http://www.asm-detroit.org/pdfs/011wmedu.pdf>

The offer extended to their members was \$40 per lecture, all 6 lectures for \$200.

The concept sparked interest here in offering a great value, and a reasonable cost program, and may be easier for many to schedule in our high demand lifestyles. We could offer the same material content as a 2 day MEI course across a multi-week program. Attendance could be either as a series, or individual meetings to better serve the needs of our members and of companies in the area.

If you would be interested in attending a similar program (the subject matter is still to be determined), or in presenting or assisting in the development and offering of such programs, please feel free to contact me directly. In order to be effective, we critically need YOU to tell us about your ideas and your technical needs.

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Atlanta Chapter Sustaining Memberships

The Atlanta Chapter of ASM is strongly encouraging companies and other organizations having materials related interests to sign up with the Chapter's Sustaining Membership program. Contact **Subu Shanmugham** MicroCoating Technologies, 5315 Peachtree Industrial Blvd., Chamblee, GA 30341 678-287-2417V; subu@microcoating.com

LabVIEW Seminars in Atlanta

This item is listed since some may be interested in learning more about automating your instrumentation. National Instruments is offering a free hands-on Seminar of LabVIEW, demonstrating their software package for data acquisition, data analysis and instrumentation. There will also be a Motion and Vision seminar. These seminars are scheduled for Tuesday, February 20, 2001 in Norcross, GA. Even though free, you have to register for the seminars. Contact National Instruments at: <http://www.ni.com/seminars/usa.htm>, or e-mail: ni.register@ni.com, or call toll-free (888) 444-3539

Applied Diamond Conference

Auburn University Hotel & Dixon Conference Center
Auburn, Alabama USA, August 6-10, 2001
Sixth Applied Diamond Conference / Second Frontier Carbon Technology Joint Conference.

Auburn University is hosting a conference this summer on applications, technological, and enabling fundamental issues on Diamond Materials, Nitrides, Carbides, Carbon Nanotube & related Nanomaterials, as well as other related structures, devices, & systems. Abstract deadline: 2/15/01
<http://www.eng.auburn.edu/departement/ee/ADC-FCT2001/speaker.htm>

ASM Trustee Visit April 17, 2001

Dr. Subi Dinda, of Daimler Chrysler and an ASM International Trustee, will visit the Atlanta and GT Student Chapters on April 17. He will make a presentation at the regular chapter meeting on that evening entitled: **"Material Challenges – 21st Century"**

Dr. Subi Dinda is senior manager of Advanced Manufacturing Technology Development in the Liberty and Technical Affairs Department of Vehicle Engineering, Daimler Chrysler Corporation. He is responsible for the major advanced materials and manufacturing process development programs for the corporation. He is the current chairman of the corporate Aluminum Tech Club.

"Living In a Material World" \$500 Grants for K-12 Teachers

A new program has been announced by the ASM International Foundation, "Living in A Material World" Program. Beginning in 2001, the ASM International Foundation is sponsoring 10 awards at \$500.00 each for those science teachers chosen from the participants.

Here's a fun and rewarding way to exercise creativity as a teacher – and be recognized for it! The ASM International Foundation's mission is to excite young people worldwide in materials careers. Members of the affiliated professional society, ASM International (www.asminternational.org), visit schools and frequently observe that students are fascinated by materials but rarely have an opportunity to learn anything about them. To help teachers bring the "real world" of materials science into the classroom, the ASM International Foundation is awarding 10 grants of \$500 each to teachers, K-12.

Students today are largely isolated from the materials that make up the products that add so much to our quality of life. Material choices are part of the design of all things. Yet this part of our world remains mysterious – as unknown to our children as the depths of the ocean. Members of ASM International know how rewarding it is to develop or produce the metals, glasses, ceramics, semiconductors, and polymers at the heart of all new systems. Students, however, often hear of materials science too late for career planning.

Proposals may be submitted electronically by May 25 of each year to jdeather@asminternational.org, or by mail to: ASM International Foundation, Attn: "Living In a Material World" Program, Materials Park, OH 44073-0002. Be sure to include appropriate school name and address, teacher's name, grade(s) taught, and the school telephone number. Awards will be made in August.

Contact Atlanta Chapter Vice. Chair, Kim B. Spinsby, at 770-740-3185V, kim.spinsby@sea.siemens.com, or Chair. John L. Mihelich, at 770-942-7893V, yodonna@aol.com

Nominations for ASM-Atlanta Chapter Officers

Please make your suggestions for next year's Chapter officers to the Nominating Committee Chairman, **Prof. Naresh Thadhani**. Or, if more convenient, give your suggestions to one of the other two members of the nominating committee, **Jim Hubbard** and **Bill Livesay**. The back page of this Newsletter gives you several ways to reach each of these people. The strength and usefulness of your chapter is strongly affected by the leadership that you elect. If you have good ideas for a better chapter, put these ideas into action by suggesting for an office either yourself or others who will work & lead.

**New ASM Periodical:
“Practical Failure Analysis”**

ASM presents the premiere issue of its new periodical, “Practical Failure Analysis”, which provides information and tools to assist failure analysis professionals in determining the cause of failures and eliminating failures in the future. Request your FREE review copy today through the ASM International Web site: <http://www.asm-intl.org/>
Edited by Dr. McIntyre R. Louthan, Jr.
Subscriptions are \$125 for members.

Atlanta ASM Chapter Officers

Chairman: **John L. Mihelich**, Metal Experts International, 7440 Mason Falls Drive, Winston, GA 30187, 770-942-7893V; 770-942-0922 F, yodonna@aol.com

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