



ASM - Atlanta

Newsletter of the Atlanta Chapter of ASM International
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December, 2000

Volume 7

Number 4

CHRISTMAS MEETING WITH SPOUSES (and/or Friends)

Tuesday Evening, December 12, 2000
at the Georgia Tech Ferst Place Cafeteria
3rd floor of the Student Center Building

PROGRAM

Why Stuff Falls Apart

presented by

McIntyre R. Louthan, Jr.
Westinghouse Savannah River Company

ASM Chapter Christmas Meeting
Tuesday Evening, December 12, 2000

Wine Reception & Social: 6:00 PM

Dinner: 7:00 PM

Presentation: 8:00 PM

Costs: \$20.00 Regular, \$6.00 Students

Program only: No Charge

Menu: Georgian Pecan Crusted Chicken, Caesar Salad,
Roll & Butter, Coffee (reg & decaf), Iced tea, Pecan Pie
dessert, 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.

Door Prizes!!

Reservations: RSVP - by 11:00 AM on Monday,
December 11, 2000, to Marlene White,
Tel: (404) 894-2850, Fax: (404) 294-9140,
marlene.white@mse.gatech.edu

ABSTRACT: Why Stuff Falls Apart

This humorous lecture discusses the six fundamental
causes of failure of large engineered systems:

1. deficiencies in design,
2. improper materials selection,
3. defects in materials,
4. improper processing,
5. errors in assembly and
6. improper service.

The discussion demonstrates that these fundamental causes
can also be associated with human failures such as divorce,

child abuse and managerial inaptitude. Additionally, the three basic reasons for conducting an engineering failure analysis (avoidance of similar failures, improvement of future systems and placement of blame) are also discussed and shown to be applicable to human failures. The similarities among failures in engineering systems and failures in modern society are also discussed. The failure processes are then shown to generally involve a compromise of personal ethics and morals because of greed and other societal influences.

Mac developed this lecture-talk titled "Why Stuff Falls Apart", to emphasize the importance of ethics in professional activities. This lecture has been given several hundred times to high school, university, industry and professional groups and as a keynote address to the annual meetings of the Materials Research Society, the International Metallographic Society and ASM International. Mac continues to regularly present this talk to the National Youth Science Camp, to various colleges and universities and to service and professional organizations. Please take advantage of your opportunity to meet and hear Mac within the intimate environment of an Atlanta Chapter ASM meeting.

Biography: McIntyre R. Louthan, Jr.

Senior Advisory Engineer, Materials Technology Section
Savannah River Technology Center
Westinghouse Savannah River Company, Aiken, SC 29808

Dr. Louthan is a Fellow in ASM International, past president and member of the Board of Directors of the International Metallographic Society, and he is currently on the Board of Trustees of the National Youth Science Foundation. Mac is currently a Consulting Engineer in the Savannah River Technology Center of the Westinghouse Savannah River Company. He has forty years of experience in applied and fundamental research, materials selection and utilization, failure analysis and teaching. Assignments have included: Professor of Materials Engineering, Manager of Metals and Ceramics Research Group, Adjunct Professor for ASM-International's Materials Engineering Institute, consultant for industry, national laboratories and legal profession and Engineer/Scientist for Contractors to U. S. Department of Energy. Mac has published approximately 250 technical papers (many of which emphasize environmental degradation of engineering materials), edited nine books and given several hundred invited lectures throughout the US, Canada, Europe and Asia.

He also had major impacts in the development of hydrogen diffusivity, solubility and permeability equations for metals and alloys, the modeling the temperature dependence of tritium retention in tritium production targets, and the metallurgical evaluation of fatigue, corrosion, stress corrosion and wear failures in reactor components.

Mac was a Professor of Materials Engineering at Virginia Tech from 1975 through 1987. While at Virginia Tech, he was elected to the Academy of Teaching Excellence, won the Wine and two Sporn Awards for teaching excellence, taught ASM International courses on Materials and Failure Analysis in the U. S., Singapore, Indonesia, and Malaysia, acted as co-chairman of nine international conferences and received a certificate of teaching excellence on eleven occasions. Prior to joining Virginia Tech, Mac was Manager of the Metals and Ceramics Research Group at the Savannah River Laboratory. He returned to Savannah River in 1987.

Mac has been married to Frances (Fran) Webb Louthan since 1961. Fran was elected as an Outstanding Young Women in America for her efforts in Aiken's elementary art program. Mac and Fran have five grandchildren and two more are on the way toward delivery in 2001.

Atlanta ASM Chairman's Message

by John L. Mihelich

The Christmas Season is upon us as we are reminded by the big time shopping being done at our malls and stores throughout the country. Your Chapter has planned an outstanding "spouses nite" program, on 12 December, which will appeal to our spouses by giving them a view, in a lighthearted manner, of an interesting topic that we as engineers get involved in. Dr. Mac Louthan, from the Westinghouse Savannah River facility, will present "*Why Things Fail*". Mac has an excellent reputation as an exciting speaker and comes highly recommended by members of our Executive Committee. My wife and I will be present to enjoy Mac's talk.

For this special event, we are also planning to have door prizes that will be awarded via a drawing following Mac's presentation. You will remember that we heard about antiques at last year's spouses nite program. At the 12th December dinner meeting, we will have a number of rather interesting antique pieces, with accompanying histories, which have been donated as door prizes. Other gift items will also be included in the door prize drawing.

Naresh Thadhani, Billy Livesay and Jim Hubbard, all Past Chairman of our Atlanta Chapter, have agreed to form the Nominating Committee to select a slate of officers for 2001-02. If you know of a member who wishes to get more involved with the operation of our Chapter, please contact a Nominating Committee member. Election of 2001-02 officers is expected to take place at our April meeting with the list of candidates appearing in the April addition of our NewsLetter. I expect that the Atlanta Chapter will not have the same legal wrangling that we have sadly experienced with our Presidential Elections. I

for one hope that all is settled by the time this December NewsLetter goes to press.

Please remember that we want to get our meeting attendance up to 30 attendees on a consistent bases. You are encouraged to bring your spouse and a colleague or two along. Our meetings 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 on 12 December at First Place Cafeteria in the Ga Tech Student Center.

RESEARCH EXPERIENCES FOR TEACHERS

Georgia Institute of Technology, Atlanta, June 5 to August 3, 2000. Sponsored by NSF as an RET supplement to the REU Site Grant No. DMR-9820349: by Naresh Thadhani

The NSF-funded *Research Experiences for Teachers (RET) program* site in the School of Materials Science and Engineering (MSE) at Georgia Tech, involved the participation of five teachers from Atlanta area High Schools. The RET program was conducted in conjunction with the GIFT program at Georgia Tech, which coordinates summer employment for teachers at academic institutions and local businesses in the state of Georgia. The teachers worked with MSE faculty and graduate students for an 8-week term, during the summer. They were exposed to a broad spectrum of materials related activities, through weekly seminars presented by Georgia Tech faculty, and field trips to local companies including Lockheed Martin and Lucent Technologies. While being involved in research, they also designed and developed materials modules to implement in their physics and/or chemistry curriculum. As part of the program, the teachers received a stipend of \$5,200, and an additional \$800 for purchase of supplies/equipment to take back to school.

The following table lists the names of the teacher participants and the titles of their modules.

<u>TEACHER</u>	<u>SCHOOL</u>	<u>COURSES TAUGHT</u>	<u>MODULE</u>	<u>GEORGIA TECH FACULTY</u>
<u>Stacey Garren</u>	<u>Heritage H.S., Conyers.</u>	<u>Chemistry 1, 9th grade Physical Science</u>	<u>Relating Ceramics and Metals to Atomic Bonding (to explain concepts of chemistry)</u>	<u>Ashok Saxena</u>
<u>Robert Hunter</u>	<u>North Springs H.S., Atlanta.</u>	<u>Chemistry and Physics</u>	<u>Living in a Materials World: Physics and Chemistry (Design, fabrication, application of superconductors)</u>	<u>Tom Sanders</u>
<u>Marie Johnson</u>	<u>Chamblee H.S., Chamblee.</u>	<u>AP Physics, Mag Physics</u>	<u>Physics of Materials and Impact Phenomenon (Drop tower tests for strength & hardness measurements)</u>	<u>Naresh Thadhani</u>
<u>John Nice</u>	<u>Avondale H.S., Avondale Estates.</u>	<u>Physics, AP Physics B, Physical Science</u>	<u>Materials Science with Calculator Based Lab (stress/strain, elect/magn. prop measurements)</u>	<u>Brent Carter</u>
<u>Donald White</u>	<u>Northgate H.S., Newnan.</u>	<u>Chemistry, AP Chemistry, Astronomy</u>	<u>Metallography of Fracture (Microstructure Analysis & fracture properties)</u>	<u>Arun Gokhale</u>

Follow-up visits of teachers along with their students to laboratories at Georgia Tech are planned for the year. Some of the teachers have also participated and made a presentation at a Teachers Day workshop held at Georgia Tech. We are looking forward to working with them in order to increase the awareness of the field of materials science and engineering in schools in our community.

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Photo - JPEG decompressor
are needed to see this picture.

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RET teachers Stacey Garren and John Nice interacting with REU student Herbert Miller (standing) and MSE graduate students during a Thursday afternoon social hour.

RET teachers (from left-to-right) - Donald White, Marie Johnson, Stacey Garren, and John Nice (Robert Hunter not

pictured), who participated in summer research in Materials Science and Engineering at Georgia Tech, Atlanta.

Update Your Record at ASM International

ASM International requests that each member go to the ASM web site www.asminternational.org in order to verify your addresses, employment, contact details, email, etc. You will use your member number, found on your ASM Membership card or on a mailing label from ASM, to access your personal record. Find this page under "For Members Only" on the ASM web site listed above.

Atlanta Chapter Sustaining Memberships

Why become Chapter Sustaining Members? Every so often each one of us get solicited for becoming a member in this or that organization. But how often do you get such a call for a noble cause that benefits both your profession and your community? Here is one such call. As a new initiative of the Atlanta ASM Chapter, we are trying to attract Material and Engineering Companies in Georgia to become **Atlanta Chapter Sustaining Members**.

By becoming Sustaining Members, companies derive substantial value for themselves as well as their employees. For example, companies get recognized in every issue of the local newsletter and once a year they are honored for supporting the Atlanta chapter in a special event. Employees get a chance to network with peers, customers, suppliers, and possibly hone their management and organizational skills by taking active leadership roles in the local chapter.

Consider joining as a Chapter Sustaining Member to become an active participant in shaping the local chapter programs from seminars to education to student outreach and social events. Benefits that accrue to member companies and their employees are many and a select few are highlighted below:

- Help encourage high school, undergraduate and graduate students to pursue careers in materials
- Play an active role in instituting scholarships, mentoring students, and educate people on materials
- Opportunity to give something back to the community
- Be recognized in every issue of the Atlanta ASM Chapter newsletter

- One free advertisement in the newsletter in a year & discounted rates for additional advertisements
- Opportunity to network with peers from Companies in and around Atlanta
- Receive discount on technical books, journals, and engineering software packages from ASM
- Save up to \$100 in registration fees in ASM's annual conferences and expositions
- Chance to play leadership roles in the local chapter

Companies worldwide have discovered the difference that supporting their local ASM professional chapter can make in their organization. By becoming a chapter sustaining member, your company is eligible to have its employees participate in professional chapter activities. This enables your employees to have access to a variety of valuable informational resources, as well as special discounts on industry-related products and services. It also demonstrates your company's dedication to the metals and materials industry, providing positive community relations.

The cost of the membership is \$200/year. We thank you for your consideration. Please contact Subu Shanmugham at 678-287-2417 or subu@microcoating.com for more information.

LeaderShape Institute

Contributed by Dr. Thadhani

Below is a message from Let Woo, graduate of MSE at GaTech (2000), and former recipient of the undergraduate student award from the ASM Atlanta Chapter

The LeaderShape Institute is a six-day leadership development experience that focuses on "leading with integrity." The ASM International Foundation offers the Arthur E. Focke LeaderShape Award every year to encourage the development of materials specialists. As a recipient of this ASM award, I attended the national session of the LeaderShape Institute at the Allerton Park Conference Center in July 2000.

The national session included about sixty participants from all over the United States ages 17 to 25. Participants were not only materials scientists but came from all different backgrounds and organizations. The week long experience involved seminars and activities concerned with how to improve your organization, workplace, or community. Specific issues that were addressed included:

- Learning to work in high-performance teams
- Decision-making for ethical dilemmas
- Dealing with change
- Clarifying personal values and standards
- Understanding and respecting the values of other individuals

For me, the week was an intense and meaningful experience that helped me to understand some of the issues that everyone, not just leaders, have to deal with everyday in their lives. The LeaderShape Institute has given me a sense of confidence and purpose in the choices I make. ASM provides a tremendous opportunity for materials students by offering this scholarship. I highly encourage everyone to take advantage.

- Leta Woo

Coatings Simplified

by Subu Shanmugham

Coatings are ubiquitous and omnipresent. One finds them; as the paint in and on a house; and then as metal or insulator thin films in computer chips, in mobile phones and in many other devices to which we have become accustomed everyday. Coatings may serve either single or multiple purposes. Coatings can protect, enhance appearance, or act to convert one form of energy into another. For example, water resistant coatings applied on the deck enhance longevity and, at the same time, provide aesthetic value.

Coatings are often classified as thin and thick. Some textbooks classify them to be thin if the thickness is less than 10 microns. For those who are struggling with conversion, help is here: 1 mil (1/1000th of an inch) equals 25 microns. A hair on your head is about 50 microns thick. Several methodologies are available for producing coatings. Thin coatings could be applied by solution, vapor, or by physical or ion bombardment techniques. Sol-gel, chemical vapor deposition and their many modifications, including combustion chemical vapor deposition, and sputtering are examples of a solution, vapor, and a bombardment process, respectively. Representative thick film technologies include electroplating, air plasma spraying and a large range of other methods.

Coatings can range from porous to dense, depending on the application. For example, corrosion resistant coatings are typically dense to prevent permeation of solution or gases into the substrates that they intend to protect.

Materials Positions Available

SEM Technician Needed

An SEM and materials characterization technician is needed in the Atlanta area. This person will be an R&D team member responsible for day-to-day operation and maintenance of analytical instruments. Includes sample preparation, microstructure analysis and organization and reporting of data. Provide microstructure process analysis

to support production line. Please contact Jean Dunaway at 770/384-0427.

Materials Engineer/Metallographer Needed

Materials Engineer/Metallographer needed by materials testing and consulting firm. Opening in Atlanta area. B.S. Materials Science and 2+ years minimum experience required. EIT/PE preferred. Must exhibit excellent communication skills and computer skills. Fax letter, resume and salary history: 770-424-6415 or mail: James Lane, ATS, 1190 Atlanta Industrial Drive, Marietta, GA 30066. E-mail: jlane@atslab.com

Directions to the Georgia Tech Student Center

From I75/85 in midtown area, take the 10th street exit. Go west on 10th street, and turn left at the stop light on State Street (Papa John's pizza is on right). From State St. turn right onto Ferst Dr. Drive past the Athletic complex (on your right) and a traffic light. The student Center parking lot will be on the left. The building to the immediate east of the parking is the Student Center. The meeting will be held in Ferst Place, which is located on the northwest-end of the 3rd floor.

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

1st Vice Chairman: **Kim B. Spinsby**, Siemens Energy and Automation, 100 Technology Dr., Alpharetta, GA, 30005, 770-740-3185V; 770-740-3050F, kim.spinsby@sea.siemens.com

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Secretary: **Gautum R. Patel**, Georgia Tech Research Institute, Material Analysis Center
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