



The Materials  
Information Society

# Micro-Examiner

DETROIT CHAPTER

MARCH 1998

## JOINT ASM/AFS MEETING

# COMPUTER MODELING OF FOUNDRY SOLIDIFICATION PROCESSES

It is our pleasure to welcome long time ASM and AFS member, Dr. Jonathan A. Dantzig of the University of Illinois at Urbana-Champaign. Dr. Dantzig received a Ph.D. in Mechanics and Materials Science, a MSE and BSE in Mechanics, all from John Hopkins University. At present he is a professor at the University of Illinois in the Department of Mechanical and Industrial Engineering. Dr. Dantzig has received many honors and awards on the topics of metallurgy, solidification processes, and casting, and has presented many talks around the globe on these subjects. Dr. Dantzig also holds a number of patents and has authored many papers on a wide variety of research topics. Of special interest to Dr. Dantzig is materials processing, especially solidification and casting processes. Monday, March 9th, Dr. Dantzig will share his expertise on the subject of sand casting with ASM, and our AFS friends.

Dr. Dantzig will present a talk on sand casting, where molten material is poured into a mold via a delivery system of ducts and channels, with the fluid displacing the air. The shapes and sizes of the sprue, runners and ingates are critical to the entire process because they determine, among other things, the rate, uniformity and smoothness with which material is delivered to the mold cavity. The volume of material in the rigging system also represents an additional cost in the process. The many, sometimes conflicting, requirements for a sound casting suggest that computer simulation and modeling can provide valuable insight into rigging system design to meet these requirements.

The objective of this work (casting) is to develop a new, more direct method for casting-rigging design. The design of the delivery system is treated as an optimization problem, where in a systematic method for optimally sizing the runners and ingates is applied. In the first part of this talk computational methods for performing simulations and sensitivity analysis will be presented. Experiments which verify both the simulation itself, and the optimization scheme will also be shown. Won't you help us welcome Dr. Dantzig, as well as our AFS friends and colleagues.



**Speaker:**

DR. JONATHAN A. DANTZIG, Ph.D.  
Professor Mechanical & Industrial  
Engineering  
University of Illinois at Urbana-  
Champaign

**Technical Chairman:**

JOHN TARTAGLIA  
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### Joint ASM/AFS Meeting — Monday, Mar. 9, 1998

Vladimir's — 28135 Grand River, Farmington

Social Hour	5:45 p.m.	Price with reservation .....	\$15.00
Dinner	6:30 p.m.	Later reservations and all non-reservation ...	\$16.00
Meeting	7:00 p.m.	Tickets sold at door .....	\$16.00
		Students with I.D. card .....	\$ 5.00

Reservations must be phoned to our ASM Chapter office, 810-573-0700, by noon on Friday, March 6.

Next Meeting: April 13, 1998

Visit the Detroit Chapter's Website for up-to-date info at  
[www.asm-detroit.org](http://www.asm-detroit.org)

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# CHAIRMAN'S MESSAGE

Mid-winter blues got ya down? The Detroit Chapter of ASM has the cure! Our March program will surely warm the cockles of your heart. On March 31st at our educational seminar, we will be talking about *Innovative Material Solutions applied to High Performance Automobiles*. John Valentine, Chief Engineer for Ford Motor Sports will get your blood racing with film, slides, and commentary on what has happened in motor sports and how Ford Motor is working to improve the breed. Chrysler Prowler, Panoz Roadster, GM Corvette . . . great speakers . . . it doesn't get any better than this. Be sure to come, and bring your friends. You won't be disappointed!

There's nothing like laughter to chase the clouds away. Our Entertainment Committee has planned a winter outing that will bring some chuckles to your heart. Check out the enclosed flyer in this month's Micro, and join us at Joey's Comedy Club in Livonia on March 28. Plan a night out with ASM-Detroit and bring your friends.

Our regular monthly technical meeting this month will be on March 9th and will be a joint meeting with AFS that will combine warmth for your heart and food for your mind. Foundrymen know how to heat things up. No one is friendlier, and we will learn a few things about analytical modeling and solidification. Our monthly meetings are always worthwhile - be sure to attend.

Brian Theil, Manager of ASM International Chapter Relations and Development, attended last month's Executive Committee and Detroit Chapter technical meeting at Vladimir's. He attended with Al Romig, ASM International President, and wrote me a note to "commend us on a great meeting". Brian said "as Al Romig mentioned during his remarks, the Detroit Chapter has a well-deserved reputation as being one of ASM's very best. Certainly you're by far the biggest. I was quite impressed by what I heard and saw at your meeting, and so all I can say is 'keep up the good work.' You've got a great group of people behind you."

That's us here at ASM-Detroit! A great team cookin' up some heart healthy activities for March. I'm sure there's something on our agenda that will interest every one of you. Set some time aside for yourself and join us!

—Larry R. Smith, Chairman



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Continuing a tradition established by the legendary competition between The University of Pittsburgh and Carnegie Mellon University, the International Metallographic Society, in association with ASM International, is sponsoring the Graduate Student Challenge Poster Competition. All graduate students in materials science programs are eligible, and the work described need not be completed research.

Grand prize includes up to \$1200 towards expenses to attend the IMS Convention in Ottawa, Canada and the opportunity to present a paper describing their graduate work at the IMS Technical meeting. After subsequent review, the paper will be published in the Proceedings under the series title "Microstructural Science." For contest rules or more information, please contact Jeff Stewart at (508) 222-7400 ext. 329, or e-mail: [jeff@metallography.com](mailto:jeff@metallography.com) or visit their website at: [http://www.metallography.com/grad\\_stu98.htm](http://www.metallography.com/grad_stu98.htm).



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# 1998 YEARBOOK COMMITTEE

The 1998 Yearbook committee is in full swing, and have already mailed advertising contracts to our current advertisers along with a copy of the 1997 Yearbook. New and potential advertisers will be mailed contracts this month. Every effort is being made to get the 1998 Yearbook to our members as close to the beginning of chapter year (October-November) as possible. However, we need our advertisers cooperation. Deadline for advertising this year will be April 30, 1998. If you are interested in advertising, or have a lead on a company, contact Caryn at the Chapter office and she will be glad to get a contract out.

We know the Yearbook and Buyer's Guide is a valuable resource to our membership, and we make every effort to ensure it's accuracy. If your membership information is not cur-

rent or correct, please contact ASM International at 1-800-336-5152 and ask for Member Services. The Detroit Chapter receives our membership roster from headquarters, so all changes must be made with them. We appreciate your cooperation.

The 1998 Yearbook committee wishes to recognize the many chapter members that actively communicate their findings through publications and presentations. If you have a publication or have made a presentation on any materials subject at a local, national or international meeting between June 1, 1997 and May 31, 1998, send the information to Caryn Ruzich at the Detroit Chapter office before May 15, 1998. Be sure to read about the activities of the Detroit Chapter and it's members in next year's Yearbook.

## CHAPTER NEWS

### ASM-Detroit Chapter Name Badges Offer

The Detroit Chapter of ASM International is pleased to offer our membership ASM logo name badges. The name badges, in attractive blue plastic with white lettering, feature the ASM logo and your name. The badges sell for \$7.50 + \$3 shipping (via Priority Mail); shipping charges waived if you choose to pick up your badge at a chapter meeting. Proceeds of the sale of these badges will benefit the Young Members/Student Affairs Committee. Please show your support for ASM by wearing your badge proudly. Contact Caryn at the Chapter office to order at (810)573-0700.

### Entertainment Committee Winter Outing

The Entertainment committee is pleased to announce an evening with ASM friends and family to be held Saturday, March 28th, at Joey's Comedy Club in Livonia. Appearing at Joey's is Vic DiBitetto of Carolines in New York and Derek Richards. The evening will begin with dinner at 6:00 p.m., and the show, titled "We aim to Die Laughing!" The ticket price of \$29 includes an all-u-can-eat buffet with coffee, tea or soft drink and dessert. All taxes, gratuity and show are also included. Look for the enclosed flyer in this months Micro Examiner, and R.S.V.P to Caryn at the Chapter office at (810) 573-0700. This is sure to be an evening full of laughs, join us!

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# 1997-98 CALENDAR OF EVENTS



**March 9, 1998**

Joint AFS/ASM Technical Meeting, Vladimir's  
"Computer Modeling of Foundry Solidification Processes"  
Jonathan A. Dantzig, Ph.D., University of Illinois



**March 12, 19 & 26, 1998**

Lecture Series-Composites Technology Update  
6:30 P.M. at Lawrence Tech  
Director-Michael Vinarcik/Presented in cooperation with SAE-Detroit  
For more info: [www.sae-detroit.org](http://www.sae-detroit.org)



**March 23, 1998**

Executive Committee Board Meeting  
TBA



**March 28, 1998**

Entertainment Committee Winter Outing  
Joey's Comedy Club, Livonia



**March 31, 1998**

Educational Seminar  
"Innovative Use of Materials in High Performance Vehicles"  
MSU Educational Center, Troy



**April 13, 1998**

Sustaining Members Night  
"Heat Treatment of Materials for Bearing Applications"  
Jerry Wolfe, The Timken Company

# FEBRUARY ATTENDANCE REPORT

We had a wonderful turn out at our National Officers and Past Chairman's Night held February 9th. Dr. Alton Romig, ASM International President spoke to about 105 Detroit Chapter members. The regular attendance prize (\$25) winner, for attending at least three consecutive meetings, was Mark Zeoli of National Steel Corporation. We will continue to draw a monthly attendance winner until the end of the season, so be sure to sign in! Also, come May, there will be a grand prize drawing of \$100 for those who have attended six of the seven monthly meetings.

The new, random attendance drawing has yet to claim a winner this season. Five members are randomly chosen from our roster, and had the following people been present, each would have won \$25:

- Terrance Malloch of General Motors Corp.
- John Dobovan of General Motors Corp.
- Kalinath Mukherjee of Michigan State University
- Michelle Morante of Consumers Power Company
- Paul Alexander of Commercial Steel Treating

This month, we are proud to hold a joint meeting with our AFS friends and colleagues. Remember, regular attendance has it's rewards (cash, that is).


Hope to see you there!!



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# SUMMER JOBS PROGRAM

ASM Detroit is in the process of setting up a summer jobs referral program. We feel this free program will be valuable to student members at our Michigan universities, and will promote closer ties between our member companies and an important source of local materials talent.

This program will take advantage of the availability of the internet access provided to college students. Our website will be the central repository for these positions with printed matter supplementing it as necessary.

If your organization intends to hire summer materials help, please list your opportunities through ASM-Detroit. The success of this program depends upon your participation!

If you have any questions, please contact Michael Vinarcik, Young Members/Student Affairs Committee Chairman at Michael-Vinarcik@msn.com or (313) 337-8377.

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## DETROIT CHAPTER 1997-1998 TECHNICAL PROGRAM

October 13, 1997

55TH WOODSIDE LECTURE

"Automotive Heat Treatment:  
A Look Ahead"

CHARLES STICKLES, E.R.I.M.  
Ford Motor Co. (Retired)

November 10, 1997

YOUNG MEMBER/UNIVERSITY NIGHT  
Joint Meeting: American Ceramics Society  
"Metal-Matrix Composites for Automotive  
Applications"

MICHAEL AGHAJANIAN  
Lanxide Corporation

January 12, 1998

"Laser Processing of Engineering Materials"

Jyoti Mazumder  
University of Michigan

February 9, 1998

NATIONAL OFFICERS' / PAST CHAIRMEN'S NIGHT  
"Micromachines: An Enabling Technology for the  
Future"

ALTON ROMIG, ASM International President  
Sandia National Laboratories

March 9, 1998

JOINT ASM/AFS MEETING

"Computer Modeling of Foundry Solidification  
Processes"

JONATHON DANTZIG  
University of Illinois

April 13, 1998

SUSTAINING MEMBER NIGHT  
"Heat Treatment of Materials for Bearing  
Applications"

JERRY WOLFE  
The Timken Corporation

May 11, 1998

OLD TIMERS' NIGHT  
"Advances in Semi-solid Forming Methods"

RAYMOND DECKER  
USP Holdings

Phone Chapter Office (810) 573-0700  
by noon on the Friday before the  
meeting for reservations.

**ALL MONTHLY MEETINGS ARE HELD AT VLADIMIR'S 28125 GRAND RIVER (at 8 Mile), FARMINGTON HILLS**

# SPOTLIGHT ON SUSTAINING MEMBERS

*The Sustaining Members of the Detroit Chapter are major supporters of the Chapter's programs. Most are regular prize donors for our annual golf outing. Many are social hour and meeting sponsors. A large number are advertisers in our Yearbook and Buyer's Guide. Needless to say, our Chapter could not provide the programs it does, here in Detroit, without the support of this very special group.*

This month, and in the remaining months of the 1997-1998 season, we will highlight our Sustaining Member companies. Please take note of these companies, look for their links on our web site, and thank their representatives when you meet them during business or at our technical meetings.

## **HOLCROFT**

12068 Market St.  
Livonia, MI 48150  
(734)591-1000

Holcroft has been a recognized leader in the design, manufacture, and servicing of high quality heat treat furnace systems since 1916. Our dedication to quality and service has been evident throughout our eighty years of service to the heat treating industry. Holcroft specializes in standard and custom heat treat furnace system designs. As a Sustaining Member of the Detroit Chapter of ASM International, Holcroft renews its commitment to constantly strive to create and improve heat treating technology that will withstand the test of time.

## **THERM ALLIANCE**

701 S. Post Avenue  
Detroit, MI 48209  
(313)843-1545  
(313)841-1335 Fax  
e-mail:  
thermalliance.therm@internetmci.com

Therm Alliance Company engineers and manufactures industrial furnaces for heat treating and aluminum brazing applications. The products include atmosphere continuous belt, walking beam, roller hearth, and pusher tray furnaces, batch and continuous forced convection furnaces, batch integral quench furnace systems and auxiliary components, and KYK-USA and TA CAAB tm Platinum series of controlled atmosphere aluminum brazing furnaces. In addition to equipment, Therm Alliance has available an inventory of spare parts, in-factory service technicians and a multitude of training programs for product and process applications.

## **UPTON INDUSTRIES**

30435 Groesbeck Highway  
Roseville, MI 48066  
Contact: Ken Minoletti  
(810)771-1200  
(810)771-8970 Fax

Upton Industries, founded in 1937 with the introduction by Norm Upton of the Ceramic Molten Salt Bath Furnace, has become one of the foremost manufacturers of heat treating equipment.

Our engineering and manufacturing talents have evolved

into a complete supplier for the "Total Package Approach to Thermal Processing". The integration of equipment with our in-house design of automated material handling equipment has allowed for our wide success in the public and private sectors of industry.

Our engineering staff also allows Upton to custom design furnaces and equipment to a customer's process and specification requirements, rather than attempting to provide standard or predesigned equipment.

## **VAC-MET INC.**

7236 Murthum  
Warren, MI 48092  
(810)264-8100

Vac-Met, Inc. was founded in 1981 for the purpose of serving the aerospace, medical, nuclear and automotive industries with metallurgical processes. Vac-Met, Inc. now serves these industries with metal treating services which involves vacuum, inert gases, hydrogen and air atmosphere processes. Equipment includes some of the more modern and larger vacuum furnaces in Michigan. Precise control systems assures the customer with high quality, reliable and repeatable service. Both laboratory and standard inspection tools are used to confirm process procedures. Every shipment is certified and records are available for review. Degreed and professional engineers are available for consultation and recommendations. Vac-Met, Inc. is NADCAP approved.