

**The Peoria Chapter of ASM International  
February 2, 2004 at the  
Mark Twain Hotel - Packard Plaza**

**The Peoria Chapter of ASM International  
and American Foundry Society**

*Present*

**RECENT DEVELOPMENTS IN THE COMPUTATIONAL  
MODELING OF MATERIAL FAILURE**

Prof. Thomas Siegmund

**SUSTAINING MEMBERS NIGHT**

Social Hour - 4:30pm • Dinner - 5:30pm

Technical Talk - 6:00pm

Prepaid Reservations Required by January 28, 2004!! Reservations are **\$15.00**.  
Call Haidong Zhang at (309) 578-6694 zhang\_haidong@cat.com.  
Please make all checks payable to "Peoria Chapter of ASM".

*About Our Speaker...*



*Dr. Thomas Siegmund* received his education at the University of Leoben, Austria, in 1995. He held two positions as research associate, at Brown University, Providence, RI, (1995-1996), and at the GKSS Research Center, Geesthacht, Germany (1996-1999). He currently is an assistant professor in the School of Mechanical Engineering at Purdue University. His research work in the area of "Micromechanics of Materials" focused on the areas of composite materials, mechanics of failure, and time dependent materials. Dr. Siegmund has authored 34 articles in refereed scientific journals.

◆ ◆ CHANGE IN ADDRESS? CALL STEVEN CROSS (309) 578-3017 ◆ ◆

*Executive Meeting*

*There will be an executive meeting of the Peoria Chapter of ASM on February 2, 2004 at 3pm at Packard Plaza. Committee chairs will provide reports and nominations for the next slate of officers and executive committee will be revealed.*

**ENGINEERS WEEK**



ASM is participating again in the National Engineers Week kick-off at Lakeview Museum February 22. Contact Scott Haines at 309-675-7073 or Haines\_Scott\_A@cat.com to sign up to give various demonstrations including magnets, casting, and play-do extrusion. Feel free to express your creative side by putting together new demonstrations that capture the attention and curiosity of elementary and middle-school age children.

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**9639 Kinsman Rd.**  
**Materials Park, OH 44073**  
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**PEORIA CHAPTER ASM INTERNATIONAL  
2003-2004 OFFICERS**

Chair .....Matt Kiser  
Vice-Chair .....Ken Burris  
Treasurer .....Chad Siebenaler / Scott Wiseman  
Secretary .....Ron Morgan

**EXECUTIVE COMMITTEE**

**2003 - 2004**  
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Sustaining Members .....Mike Motyl  
Young Members ....Trent Weaver / Matt Yaklich  
Yearbook .....Eugene Pascual  
Auditor .....Katy Gordon  
Nominating .....Tim Van Den Avond  
Historian .....Wally Hines

**Recent Developments in the  
Computational Modeling  
of Material Failure**

Analyses of structures are not complete without incorporating a description of the failure behavior. The challenge associated with this task is to link crack growth occurring at the atomistic and micro-structural level to the continuum behavior of the structure under investigation. Key to such investigations is the development of models describing the process of material separation. In recent years the mechanics community has devoted a considerable effort to the development of such failure models.

The talk will describe crack propagation and failure models, and the capabilities of such models for variety of materials. The following three examples will be discussed:

- (1) Failure of coatings and high temperature ceramic composites as of interest in thermal protection systems for e.g. space applications;
- (2) Failure of thin film systems as of relevance to microelectronics and microelectro mechanical systems;
- (3) Rupture of tissue samples;

For each of these models key features of the computational approach as well as key results from applications will be presented.

**Materials Camp**

Calling on ASM members to find interested students who will be high school Juniors or Seniors in Fall 2004. They are invited to apply for a weeklong summer camp that includes hands-on learning of applied math, physics and chemistry in a team-based problem solving science experience that includes demonstrations, field trips, laboratory tours to explore materials science and engineering principles. Applications are due **January 31** and are available at:  
[http://www.asminternational.org/pdf/foundation/Application\\_Form-generic.pdf](http://www.asminternational.org/pdf/foundation/Application_Form-generic.pdf)

