

**The Peoria Chapter of ASM International  
November 3, 2003 at the  
Mark Twain Hotel - Packard Plaza**

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

*Present*

**EXPLORING ULTRAHIGH MAGNETIC FIELD PROCESSING  
OF MATERIALS FOR DEVELOPING CUSTOMIZED  
MICROSTRUCTURES AND ENHANCED PERFORMANCE**

Gerard M. Ludtka, Ph.D.

**COMMITTEE CHAIRS NIGHT**

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

Technical Talk - 6:00pm

Prepaid Reservations Required by October 29, 2003!! Reservations are **\$15.00**.  
Call at Haidong Zhang at (309) 578-6694 zhang\_haidong@cat.com  
Please make all checks payable to "Peoria Chapter of ASM".

*About Our Speaker...*



**Dr. Ludtka** is a member of the Distinguished R&D Staff in the Metals & Ceramics Division at Oak Ridge National Laboratory. Gerry has worked in various capacities at Oak Ridge since 1982. Prior to that he was a Research Scientist at General Motors Research Laboratories. His Bachelors and Masters degrees in Metallurgical Engineering and Materials Engineering are from Drexel University, and his Ph.D. in Metallurgy and Materials Science was earned at Carnegie Mellon University. Gerry's principal areas of research and expertise include: physical and mechanical metallurgy of structural alloys; characterization of phase transformation kinetics and dilation strains; development and implementation of optimized materials' performance and materials processing through microstructure optimization; and validated, parametric sensitivity study computer simulations. Dr. Ludtka's career is marked by numerous publications, patents, and awards including multiple Department of Energy Weapons Complex Awards of Excellence as well as the DOE's E.O. Lawrence Memorial Award for Materials Research.

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

**SEASON TICKETS**

Season Tickets are now available for the 2003-2004 program year. As always, a season ticket offers a great bargain to help make attending the wide variety of technical meetings even more affordable.

**Cost: \$50 for four meetings**

Each season ticket is good for four meetings, which would normally cost \$60. In addition, the season ticket holders receive a \$10 discount on tickets for the Christmas Social. Season tickets will be available through December. Call Haidong Zhang at (309) 578-6694 or email Zhang\_Haidong@cat.com to get your ticket today!

**ASM MEI COURSES**  
Sign up now for the following courses starting this fall!

Course Title	Instructor	Phone #
Metallurgy for the Non-Metallurgist	Michael Earle	309-578-6069
Heat Treatment of Steels	Mike Johnson	309-578-4483
Principles of Failure Analysis	Ken Burriss	309-675-3796
Induction Heating	Self-Study	309-578-3339
Aluminum and Its Alloys	Gerry Gegel	309-266-7533

**? TRIVIA QUESTION ?**

*What elements exhibit antiferromagnetic properties?*

**The first person to answer completely & correctly by emailing Cross\_Steven\_M@CAT.com will receive complementary admission to the November meeting.**

- PEORIA CHAPTER ASM INTERNATIONAL  
2003-2004 OFFICERS
- Chair .....Matt Kiser  
Vice-Chair .....Ken Burriss  
Treasurer .....Chad Siebenaler / Scott Wiseman  
Secretary .....Ron Morgan
- EXECUTIVE COMMITTEE**      **COMMITTEE CHAIRS**
- |                              |  |
|------------------------------|--|
| <b>2003 - 2004</b>           | Finance .....Rie Woldow                          |
| Sam Banerji, Jackie Earle    | Program .....Mike Johnson                        |
| Fritz Gresing, Tim Hoeffft   | Membership .....Mike Pollard                     |
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| Tom Clements, Scott Kozinski | Reception .....Haidong Zhang                     |
| Ron Streib, Sheryl Tipton    | Student Outreach ...Allison Arndt / Scott Haines |
| Tim Van Den Avond            | Education .....Keith Eglund / Suzanne Raebel     |
|                              | Long Range Planning .....Steve Mathew            |
| <b>2005 - 2006</b>           | MEI .....Dave Akers                              |
| Bud Harvey, Ric Woldow       | Sustaining Members .....Mike Motyl               |
| Steve Clancy, Tom Majewski   | Young Members ....Trent Weaver / Matt Yaklich    |
|                              | Yearbook .....Eugene Pascual                     |
|                              | Auditor .....Katy Gordon                         |
|                              | Nominating .....Tim Van Den Avond                |
|                              | Historian .....Wally Hines                       |

**ULTRAHIGH MAGNETIC FIELD PROCESSING**

This presentation will cover an innovative and revolutionary research endeavor that is creating the basis for an entirely new research initiative for materials and materials process development. This approach has both scientific and industrial relevance with significant energy savings and environmental benefit ramifications and represents a major step towards achieving materials by design goals. Our experimental and modeling research efforts are clearly demonstrating that phase stability (conventional phase diagrams) can be dramatically altered through the application of an ultrahigh magnetic field. This ability to selectively control microstructural stability and alter transformation kinetics through appropriate selection of the magnetic field strength is being shown to provide a very robust mechanism to develop and tailor enhanced microstructures (*even potential bulk nanostructures through accelerated product phase nucleation and transformation kinetics*) with superior properties through a more efficient processing technology for a broad spectrum of material applications. In addition, our recent efforts this past year on bulk, amorphous ferromagnetic alloys are also suggesting that a new focus area is evolving whereby a new class of ferromagnetic materials with unique magnetic properties may be possible for hard disk and related applications. The broad goals for this research are to demonstrate and document the influence of ultrahigh magnetic field processing on the phase equilibria and kinetics for ferromagnetic materials and to develop predictive capability based on first principle calculations. Some of the highlights and implications of this research will be discussed in this presentation.

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**ASM/AFS Christmas Social**

*Make reservations today for the Christmas Social which will be held on Saturday December 6 in the Pere Marquette Ballroom. Tickets are \$60 per couple and include hors d'oeuvres and cocktails at 5:30pm, dinner promptly at 6:30pm, prizes including a SPECIAL RAFFLE DRAWING from 8-9pm, and dancing from 9-12. Diamond Dan Productions will supply the music. Special room rates are available at the Hotel Pere Marquette (309-637-6500). Reservations for this enjoyable evening can be made by contacting Chris McCarthy at 309-633-8606.*