

TMS 2003

132nd Annual Meeting & Exhibition

featuring the

TMS 2003 International Metals & Materials Exhibition

<http://www.tms.org/AnnualMeeting.html>

**BRINGING
TECHNOLOGICAL
INNOVATIONS
INTO AN APPLIED
PERSPECTIVE**



JOM
A publication of The Minerals, Metals & Materials Society

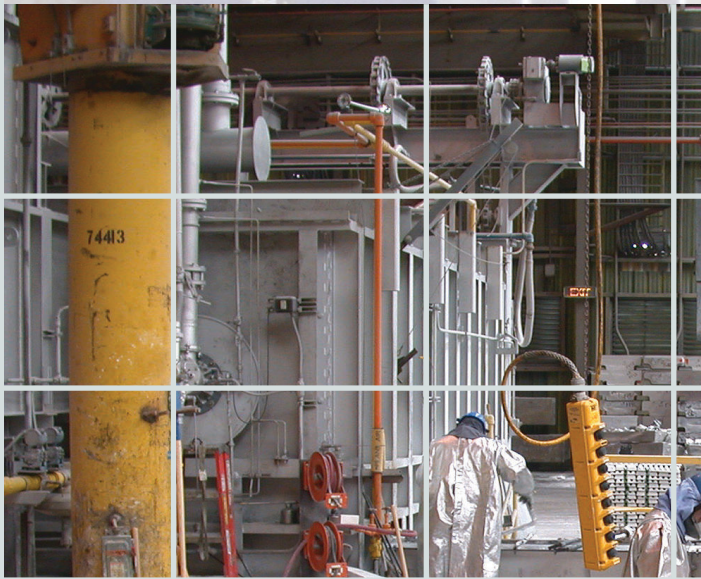
JOM-e:
Sit in on the
Homeland
Security
Symposium

FEBRUARY 2003
www.tms.org/jom.html

PROCESSING AND CHARACTERIZATION

- Aluminum In Automotive and Other Applications
- Hydrogen Effects in Materials

THE MSE OF NASCAR



FINAL PROGRAM

Including

February 2003 JOM

Exhibition Show Directory

TMS 2003 Technical Program

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WHERE TO FIND TMS ATTENDEE SERVICES

Registration

San Diego Convention Center
Hall A

Business Services/Mail Boxes Etc.

San Diego Convention Center
Business Center – Ground Level Lobby

Dining Services Information

San Diego Convention Center
Ground Level Lobby

Cyber Café

San Diego Convention Center
Ground Level Lobby

Employment Referral Center

San Diego Convention Center
Ground Level Lobby

2003 Exhibition

San Diego Convention Center
Halls A&B1

Guest Hospitality

San Diego Marriott Hotel & Marina
Oceanside Room

TMS Membership Area

San Diego Convention Center
Ground Level Lobby

Publication Sales

San Diego Convention Center
Ground Level Lobby

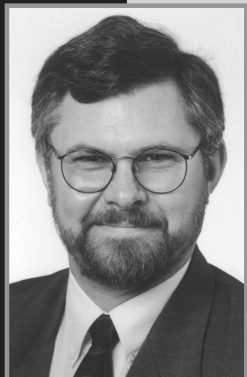
Sightseeing Tour Tickets

San Diego Convention Center
Ground Level Lobby

Housing Information Booth

San Diego Convention Center
Ground Level Lobby

PRESIDENT'S GREETING



Welcome to San Diego and the TMS Annual Meeting – the best family reunion for Materials Professionals yet. This is the 132nd time that our materials “family” has met and we keep on breaking records. This meeting we have a record numbers of papers, posters and, we expect, attendees. There will be countless opportunities to meet old friends, make new ones, to learn, to teach and to conduct important business. Speaking of numbers, let me give you just a few:

- 1,900 papers
- 48 symposia
- More than 3,500 attendees
- More than 25,000 square feet of technology on display in the exhibit hall
- More than 40 committee meetings
- 5 alumni receptions
- 50 awards and scholarships will be presented
- Three major luncheons
- Three major award speakers
- 5 technical division council meetings
- 1 board of directors meeting
- 1 major awards banquet
- More than 25,000 cups of coffee consumed
- And so much more!

Hopefully you have scheduled your week here using one of our many on-line tools, especially the versatile Personal Scheduler. Or, maybe you're walking around with a dog-eared copy of the pre-program or this at-meeting program. Either way, I know that you are discovering that an especially dynamic TMS program is awaiting you.

We have a variety of symposia on emerging and hot topics (one of which was so hot it didn't even make the advance program) including the following:

- Materials Research to Meet 21st Century Defense Needs (the results of an important and hot-off-the-press National Materials Advisory Board Study)
- Materials Prognosis: Damage-State Awareness and Mechanism-Based Prediction (aka Aging and Life Extension of Aircraft)
- Nanotechnology – actually a wide variety of different symposia on this important new “field”
- Biomaterials
- Computational Materials Science
- Environmental and Energy Issues

There are also a number of important international symposia taking place, including:

- The MPMD Fourth Global Innovations Symposium: Energy Efficient Manufacturing Processes
- International Symposium on Gamma-Titanium Aluminides
- International Symposium on Intermetallic and Advanced Materials
- International Symposium on Structures and Properties of Nanocrystalline Materials
- Yazawa International Symposium on Metallurgical and Materials Processing: Principles and Technologies

All this is in addition to our excellent, traditional core programming in aluminum, magnesium, materials processing and refining, structural materials, fundamentals of materials science, electronic materials, intermetallics, mechanical behavior, solidification, etc., etc., etc.

I want to also bring to your attention the multiple poster sessions occurring during the week that will feature more than 150 posters to look at and discuss, the Exhibition Reception from 5:00–6:00 pm on Monday and the free snack in the exhibit hall on Wednesday from 12:15 pm–2:00 pm.

The members of our materials family come from more than 60 different countries and 5 different continents. We've come from industry, academia and national laboratories – all to learn and teach the latest in the materials field. It's all very exciting – and I want to use these penultimate lines to thank the hundreds of volunteer members who have organized these symposia and who, are serving as session chairs, are sponsoring exhibits, and attending committee and council meetings. I also thank our excellent TMS staff – all of whom have endeavored to make this the finest TMS family reunion possible.

I hope you'll agree – don't hesitate to let me know what you think!

Welcome and enjoy....

A handwritten signature in black ink, which appears to read "John Allison".

John Allison, 2002 TMS President

A session no one should miss...

Materials Research to Meet 21st Century Defense Needs

Wednesday, March 5, 2003
San Diego Convention Center
Room 5B
2:00 PM

This important session will examine what the Department of Defense has identified as R&D priorities in five classes of materials:

- Structural and Multifunctional Materials
- Energy and Power Materials
- Electronic and Photonic Materials
- Functional Organic and Hybrid Materials
- Bioderived and Bioinspired Materials

and how innovative management will also be needed to reduce risks in translating fundamental research into practical materials, and to promote cross-fertilization of scientific fields.

Check the technical program listing for presentation details.

Aluminum Producers: Don't miss this featured session...

Increasing Energy Efficiency in Aluminum

Tuesday, March 4, 2003
San Diego Convention Center
Room 5B
8:30 AM

This important event will present a series of updates and current research reports on projects, funded by the Department of Energy—Office of Information Technology and the aluminum industry, that seek to increase energy efficiency in the melting, casting, and processing of aluminum.

Presentations will include:

- Aluminum Research and Development
Presenter: Thomas Robinson, U.S. Department of Energy
- Updating the Aluminum Industry Technology Roadmap
Presenter: Richard Love, Century Aluminum
- Energy Efficiency Improvement Opportunities in the Aluminum Industry
Presenter: Arvind Thekdi, E3M, Inc.
- Improving Energy Efficiency in Secondary Aluminum Melting
Presenter: Paul E. King, U.S. Department of Energy
- Reduction of Oxidative Melt Loss
Presenter: John N. Hryn, Argonne National Laboratory
- Modeling and Optimization of Direct Chill Casting for Reducing Ingot Cracking
Presenter: Srinath Viswanathan, Oak Ridge National Laboratory
- DOE/OIT PHAST Program Application in the Aluminum Industry
Presenter: Frank L. Beichner, Bloom Engineering
- Retrofitting Regenerative Burners on
Aluminum Melting Furnaces that Utilize Salt Fluxing
Presenter: Jens H. Hebestreit, Bloom Engineering

Check the technical program listing for presentation details.

2002-03 BOARD OF DIRECTORS

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John Smugeresky
Sandia National Labs

Structural Materials Division

Rusty Gray
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Incoming Structural
Materials Division

Tresa Pollock
University of Michigan

FUNCTIONAL AREA DIRECTORS

Professional Registration
Wayne Reitz
North Dakota State University

Education

Dennis Readey
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Membership Development

Darrel Frear
Motorola

Incoming Membership Development

Wolfgang Schneider
Hydro Aluminium Deutschland GmbH

Programming

Richard Wright
Idaho National Engineering Lab

Information Technology

Marc DeGraef
Carnegie Mellon University

Public & Governmental Affairs

Warren Hunt
Aluminum Consultants Group Inc

Publications

Dallis Hardwick
Wright-Patterson Airforce Base

Student Affairs

Walter W. Milligan
Michigan Technological University

Attention all 2003 TMS Annual Meeting & Exhibition Attendees!

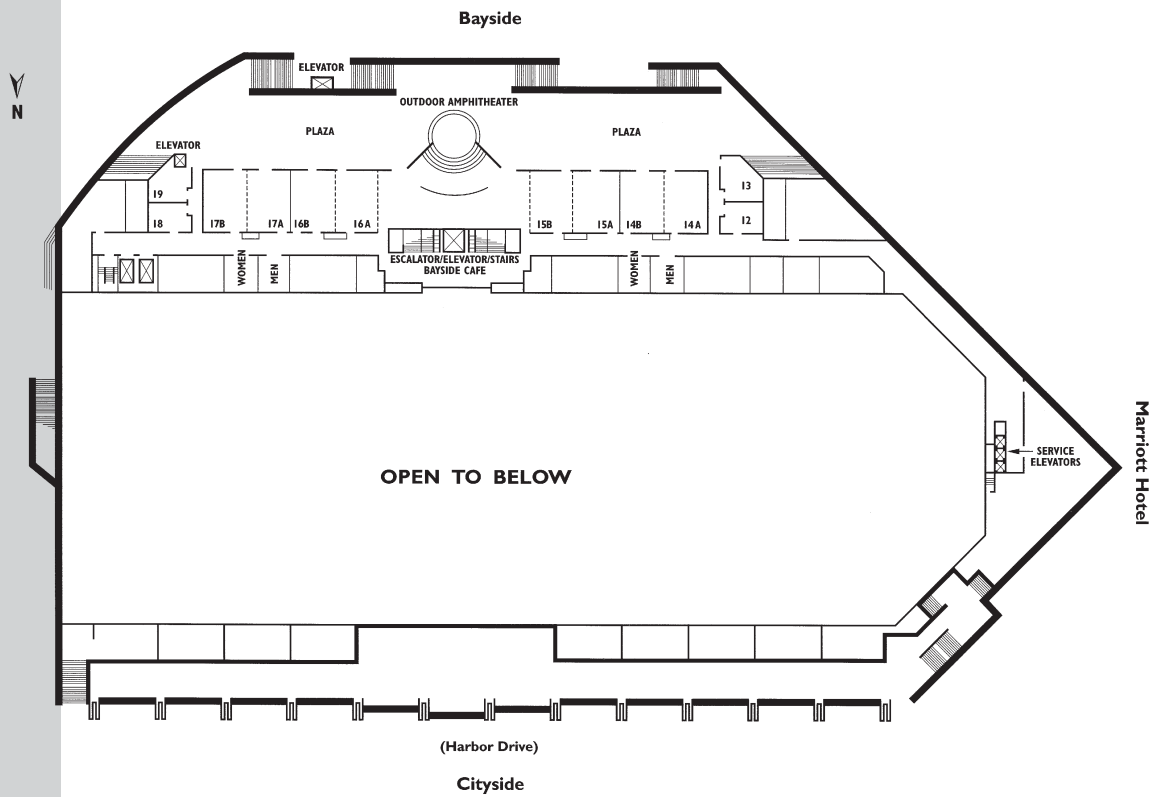
Don't Leave Without Telling Us What You Think!

It's quick and easy for you to let us know your thoughts on the 2003 TMS Annual Meeting & Exhibition. Any time on Tuesday or Wednesday, please stop by the computer survey center located in the San Diego Convention Center Grand Lobby area near the escalators. Take time out to complete the brief, touch-screen questionnaire. It will only take a couple of minutes of your time to provide vital input toward the improvement of future TMS Annual Meetings.

Thank you for participating. Your opinion is important.

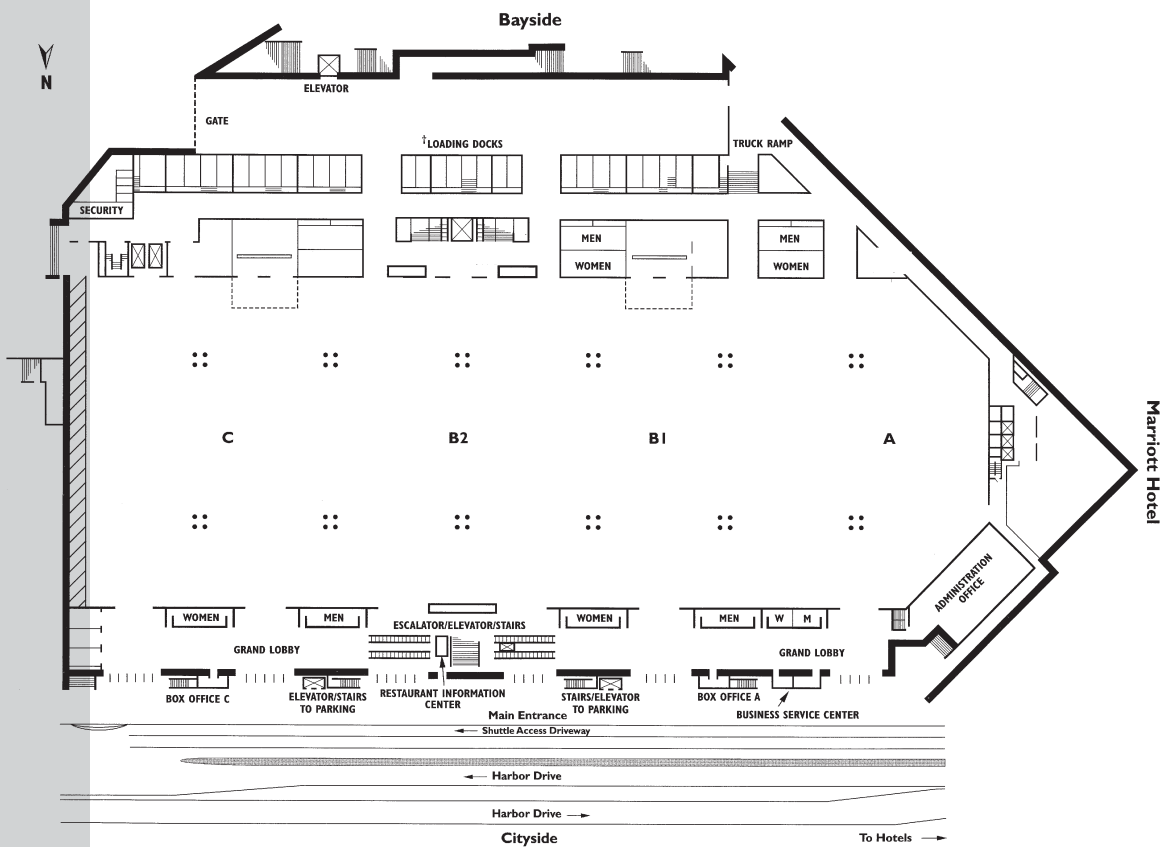
SAN DIEGO CONVENTION CENTER

Mezzanine Level—Meeting Rooms



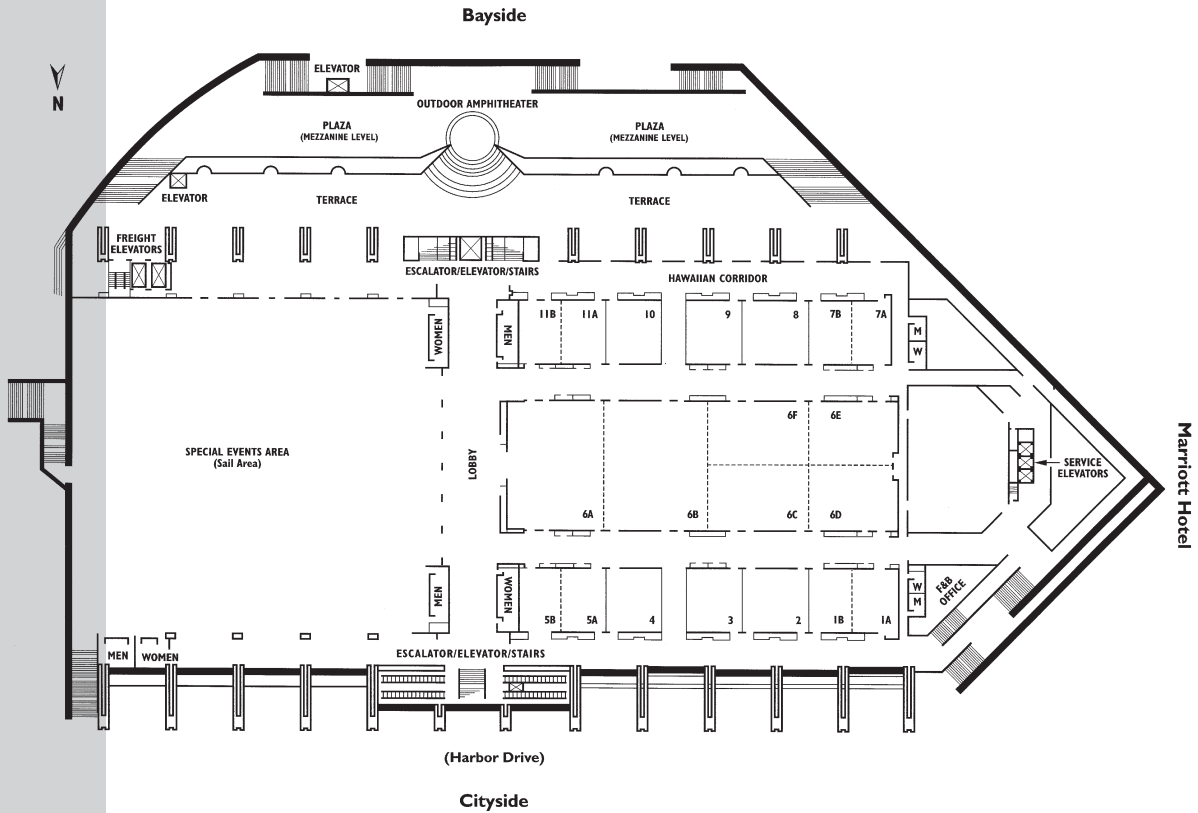
SAN DIEGO CONVENTION CENTER

Ground Level—Exhibit Halls



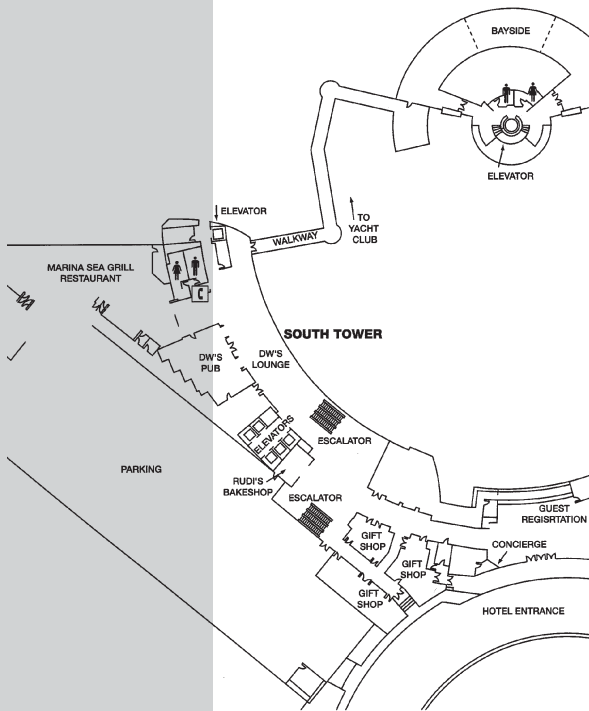
SAN DIEGO CONVENTION CENTER

Upper Level—Meeting Rooms

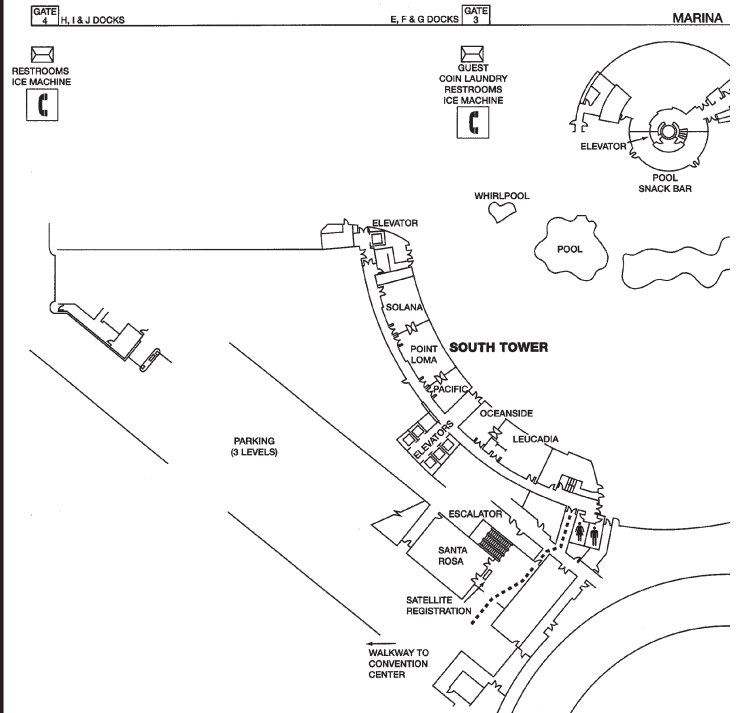


SAN DIEGO MARRIOTT HOTEL & MARINA

Lobby Level

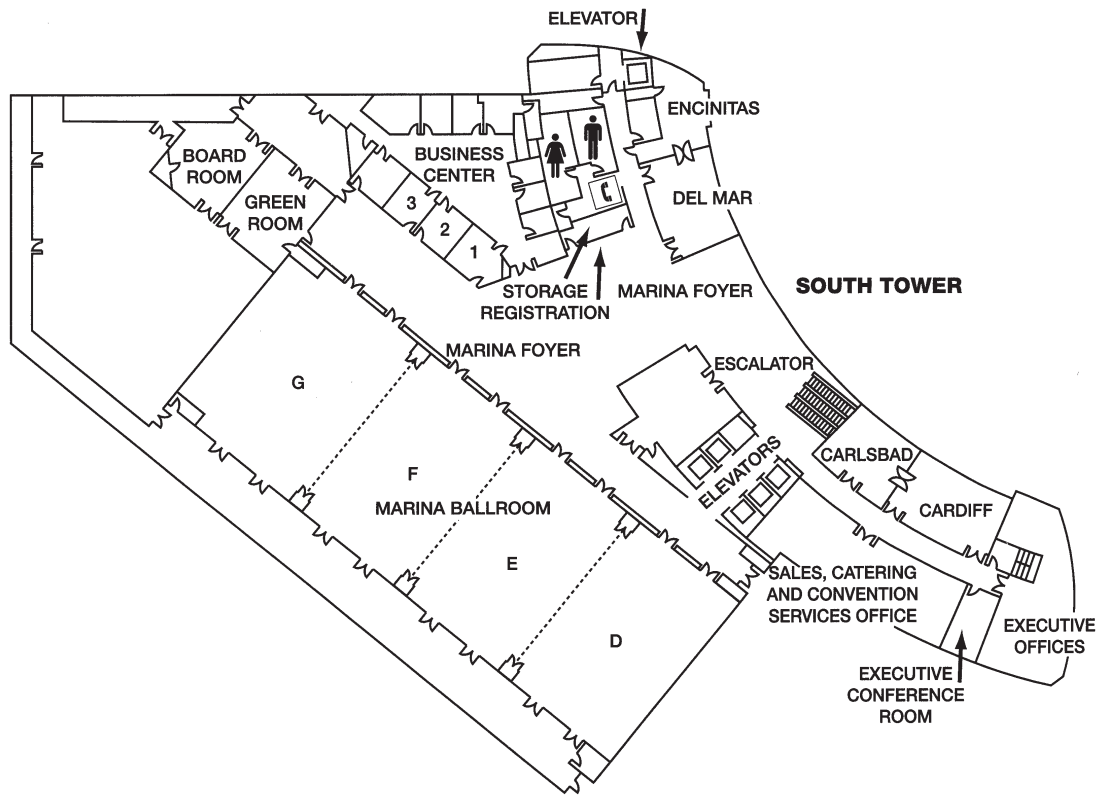


Level 1



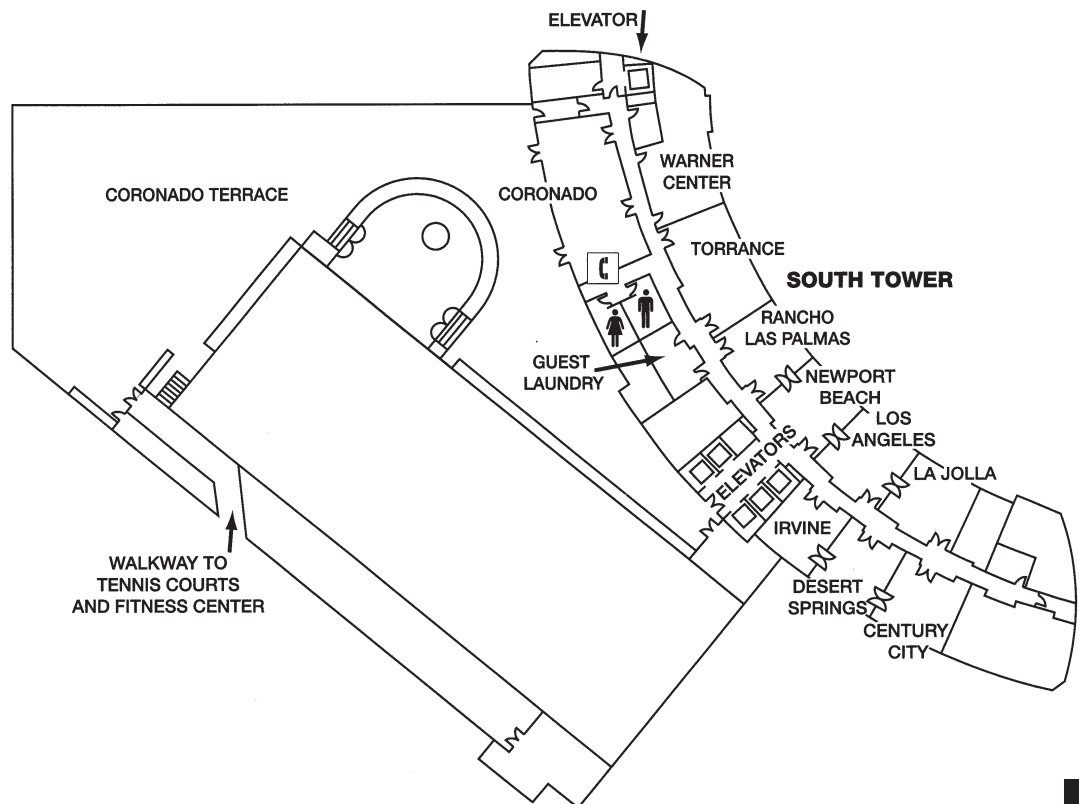
SAN DIEGO MARRIOTT HOTEL & MARINA

Level 3



SAN DIEGO MARRIOTT HOTEL & MARINA

Level 4



2003 TMS Annual Meeting & Exhibition

CALENDAR OF EVENTS

Key: "C" San Diego Convention Center "M" San Diego Marriott Hotel & Marina
 TMS Committee Meetings and Events are scheduled for the following dates, times, and locations.

FUNCTION	TIME	LOCATION	ROOM
SATURDAY, MARCH 1, 2003			
COMMITTEE MEETINGS			
Professional Registration Writers Workshop	8:30 AM–3:30 PM	M	Cardiff
PRICM-5 Organizing Committee Meeting	1:30 PM–5:30 PM	M	Green Room
Professional Registration Committee	3:30 PM–5:00 PM	M	Del Mar
SUNDAY, MARCH 2, 2003			
REGISTRATION	11:00 AM–6:00 PM	C	Hall A
TMS PUBLICATION SALES	11:00 AM–6:00 PM	C	Ground Level Lobby
TMS MEMBERSHIP AREA	11:00 AM–6:00 PM	C	Ground Level Lobby
SOCIAL FUNCTIONS			
Young Leaders Reception	5:00 PM–6:00 PM	M	Marina Ballroom D
TMS President's Reception	6:00 PM–7:30 PM	M	Bayside Pavilion
Yazawa International Symposium Welcoming Reception (by invitation only)	6:00 PM–8:00 PM		Offsite Venue
Ohio State University Alumni Reception	6:00 PM–9:00 PM	M	Rock Bottom Brewery
TMS Networking Mixer	8:00 PM–10:30 PM	M	Marina Ballroom D
WORKSHOPS			
Workshop on Modeling the Fundamentals of the Tin Whisker Phenomena	9:00 AM–5:00 PM	C	Room 11
COMMITTEE MEETINGS			
Accreditation Committee	9:00 AM–10:30 AM	M	Desert Springs
TMS/ABET Assessment Training	10:30 AM–5:00 PM	M	Board Room
Student Affairs Committee	11:00 AM–12:00 PM	M	Green Room
Financial Planning Committee	11:30 AM–2:30 PM	M	Executive Conference Room
Nominating Committee	12:00 PM–2:30 PM	M	Los Angeles
MPMD Strategic Planning Meeting	12:00 PM–3:00 PM	M	Cardiff
Young Leaders Committee	12:30 PM–2:00 PM	M	Carlsbad
Finding a Job in a Tough Economy	1:00 PM–2:30 PM	M	Marina Ballroom D
Recycling Committee	1:30 PM–3:00 PM	M	Desert Springs
Public & Governmental Affairs Committee	2:00 PM–3:30 PM	M	Warner Center
Aluminum Committee	2:00 PM–5:00 PM	M	Marina Ballroom E
Thin Films & Interfaces Committee	3:00 PM–4:00 PM	M	La Jolla
Waste Treatment & Minimization Committee	3:00 PM–4:30 PM	M	Del Mar
Student Career Forum	3:00 PM–5:00 PM	M	Laguna
Program Committee	3:00 PM–6:00 PM	M	Los Angeles
Aluminum Casthouse Technology 8th Australian/ Asia Pacific Conference Steering Committee	4:00 PM–6:00 PM	M	Carlsbad
Publications Coordinating Committee	4:00 PM–6:00 PM	M	Irvine
Pyrometallurgy Committee	4:00 PM–6:00 PM	M	Torrance
Process Fundamentals Committee	5:00 PM–6:00 PM	M	Newport
Copper, Nickel, Cobalt Committee	5:00 PM–6:00 PM	M	La Jolla
Light Metals Division Council	5:00 PM–7:00 PM	M	Coronado
Magnesium Committee	5:30 PM–7:30 PM	M	Solana
Lead, Zinc Committee	6:00 PM–9:00 PM	M	Desert Springs
Mechanical Behavior of Materials Committee	6:30 PM–8:00 PM	M	Cardiff
Alloy Phases Committee	7:00 PM–9:00 PM	M	Green Room
REWAS Organizing Committee	7:00 PM–9:00 PM	M	Rancho Las Palmas
ASM Phase Transformations Committee	7:30 PM–9:00 PM	M	Leucadia

FUNCTION	TIME	LOCATION	ROOM
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SUNDAY, MARCH 2, 2003

Computational Materials Science & Engineering Committee	8:30 PM–9:30 PM	M	Oceanside
MSCTS Council Meeting	9:00 PM–10:30 PM	M	Los Angeles

MONDAY, MARCH 3, 2003

REGISTRATION	7:00 AM–5:00 PM	C	Hall A
TMS PUBLICATION SALES	7:00 AM–5:00 PM	C	Ground Level Lobby
TMS MEMBERSHIP AREA	7:00 AM–5:00 PM	C	Ground Level Lobby
GUEST HOSPITALITY	7:00 AM–10:00 AM	M	Oceanside
SLIDE PREVIEW AREA	7:00 AM–6:00 PM	C	Room 6A
AUTHORS' COFFEE	7:00 AM–8:30 AM	C	Room 6A

2003 EXHIBITION

Exhibit Hours	12:00 PM–6:00 PM	C	Hall A, B1
Grand Opening Reception	5:00 PM–6:00 PM	C	Hall A, B1

TUTORIAL LUNCHEON LECTURE

Young Leaders Tutorial Luncheon/Lecture	12:00 PM–1:30 PM	M	Cardiff
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INSTITUTE OF METALS LECTURE & ROBERT MEHL MEDALIST

Designing Materials: From Turbine Blade to Brilliant Light Emitting Diodes	12:00 PM–2:00 PM	M	Marina Ballroom D
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SOCIAL FUNCTIONS

TMS Past Presidents' Breakfast	8:00 AM–9:30 AM	M	Presidential Suite 2540
TMS Fellows Reception	5:30 PM–7:00 PM	M	Los Angeles
Mike Meshii Honorary Dinner	6:00 PM–9:30 PM	M	Del Mar
Akira Yazawa Honorary Dinner	6:00 PM–9:30 PM	M	Marina Ballroom G
Ronald Armstrong Honorary Dinner	6:00 PM–9:30 PM	M	Green Room
Purdue University Alumni Reception	6:30 PM–8:00 PM	M	Carlsbad
Michigan Tech Alumni Reception	6:30 PM–8:00 PM	M	Laguna
Nuclear Materials Committee Mixer	6:30 PM–8:30 PM	M	Cardiff
C.T. Liu Poster Session/Reception	7:00 PM–9:00 PM	C	City-side Corridor Lobby
Gamma Titanium Poster Session/Reception	7:00 PM–9:00 PM	C	City-side Corridor Lobby

COMMITTEE MEETINGS

Met Trans "A" Board of Review	7:00 AM–8:00 AM	M	Green Room
Education Committee	7:00 AM–9:30 AM	M	La Jolla
Chemistry & Physics of Materials Committee	7:30 AM–9:00 AM	M	Desert Springs
Electronic, Magnetic, and Photonic Materials Division Council	12:00 PM–2:00 PM	M	Coronado
Membership Development Committee	12:00 PM–2:00 PM	M	Rancho Las Palmas
International Symposium on Superalloys: Program Committee	12:00 PM–2:00 PM	M	Marina Ballroom F
Process Modeling Analysis & Control Committee	12:30 PM–2:00 PM	M	Warner Center
Precious Metals Committee	2:00 PM–3:30 PM	M	Irvine
International Laterite Nickel Symposium Committee Meeting	3:00 PM–5:00 PM	M	Newport
Extraction & Processing Division Council	3:00 PM–6:00 PM	M	Coronado
Fellows Advisory Council Meeting	4:00 PM–5:30 PM	M	Desert Springs
Nuclear Materials Committee	5:00 PM–6:30 PM	M	Rancho Las Palmas
International Symposium on Superalloys: Organizing Committee	5:00 PM–7:00 PM	M	Marina Ballroom F
Solidification Committee	5:30 PM–6:30 PM	M	Marina Ballroom E
Surface Engineering Committee	5:30 PM–6:30 PM	M	Irvine
Composite Materials Committee	5:30 PM–7:00 PM	M	Torrance
Aqueous Processing Committee	6:00 PM–7:00 PM	M	Newport
Structural Materials Committee	6:00 PM–7:00 PM	M	Oceanside
Superconducting & Magnetic Materials Committee	6:30 PM–7:30 PM	M	Warner Center
Information Technology Committee	7:00 PM–8:30 PM	M	La Jolla

FUNCTION**TIME****LOCATION****ROOM****TUESDAY, MARCH 4, 2003**

REGISTRATION	7:00 AM–5:00 PM	C.....	Hall A
TMS PUBLICATION SALES	7:00 AM–5:00 PM	C.....	Ground Level Lobby
TMS MEMBERSHIP AREA	7:00 AM–5:00 PM	C.....	Ground Level Lobby
GUEST HOSPITALITY	7:00 AM–10:00 AM	M	Oceanside
SLIDE PREVIEW AREA	7:00 AM–6:00 PM	C.....	Room 6A
AUTHORS' COFFEE	7:00 AM–8:30 AM	C.....	Room 6A

2003 EXHIBITION

Exhibit Hours	9:30 AM–5:30 PM	C.....	Hall A, B1
Supplier Session.....	11:45 AM–1:15 PM.....	C.....	Hall B1

TMS ANNUAL AWARDS BANQUET

Reception	6:00 PM–7:00 PM	M	Marina Ballroom F
Dinner	7:00 PM–9:30 PM	M	Marina Ballroom G

TECHNICAL DIVISION LUNCHEON & LECTURE

Extraction & Processing Division Luncheon	12:00 PM–1:45 PM	M	Marina Ballroom E
Extraction & Processing Distinguished Lecturer The Interdisciplinary Nature of Hydrometallurgy	1:45 PM–2:30 PM	M	Marina Ballroom D

COMMITTEE MEETINGS

Electronic Packaging & Interconnection			
Materials Committee.....	7:00 AM–8:00 AM	M	Torrance
Met Trans "B" Board of Review	7:00 AM–8:00 AM	M	Warner Center
Materials Processing & Manufacturing			
Division Council.....	7:00 AM–9:00 AM	M	Coronado
Fellows Award Committee	7:30 AM–9:00 AM	M	Marina Ballroom D
Hume-Rothery/Acta Met Award Committee.....	7:30 AM–9:00 AM	M	Marina Ballroom D
IOM/Mehl Award Committee.....	7:30 AM–9:00 AM	M	Marina Ballroom D
Honors & Professional Recognition Committee	9:00 AM–10:00 AM	M	Marina Ballroom D
Aluminum Association Molten Metal Review	9:00 AM–12:00 PM	M	Del Mar
TMS Executive Committee	10:00 AM–1:00 PM	M	Presidential Suite 2540
Structural Materials Division Council	12:00 PM–2:00 PM	M	Coronado
Powder Materials Committee	12:30 PM–1:45 PM	M	Rancho Las Palmas
Technical Division Board Meeting.....	3:00 PM–5:00 PM	M	Cardiff
Refractory Metals & Materials Committee	5:30 PM–6:30 PM	M	Irvine
Shaping & Forming Committee	5:30 PM–6:30 PM	M	Carlsbad
Titanium Committee	5:30 PM–7:00 PM	M	Torrance
Process Mineralogy Committee.....	5:30 PM–7:00 PM	M	Rancho Las Palmas
High Temperature Alloys Committee	5:30 PM–7:30 PM	M	Del Mar
Physical Metallurgy Committee	6:00 PM–7:00 PM	M	Oceanside
Corrosion & Environmental Effects Committee	6:00 PM–7:30 PM	M	Desert Springs
ASM Texture & Anisotropy Committee	6:00 PM–8:00 PM	M	Warner Center
Reactive Metals Committee.....	6:30 PM–7:00 PM	M	Executive Conference Room

PLAN TO VISIT THE CYBER CENTER**Located in the San Diego Convention Center Lobby*****Sponsored by Metallics Systems Company LP***

FUNCTION**TIME****LOCATION****ROOM****WEDNESDAY, MARCH 5, 2003**

REGISTRATION	7:00 AM–5:00 PM	C.....	Hall A
TMS PUBLICATION SALES	7:00 AM–5:00 PM	C.....	Ground Level Lobby
TMS MEMBERSHIP AREA	7:00 AM–5:00 PM	C.....	Ground Level Lobby
GUEST HOSPITALITY	7:00 AM–10:00 AM	M	Oceanside
SLIDE PREVIEW AREA	7:00 AM–6:00 PM	C.....	Room 6A
AUTHORS' COFFEE	7:00 AM–8:30 AM	C.....	Room 6A

2003 EXHIBITION

Exhibit Hours	9:30 AM–3:00 PM	C.....	Hall A, B1
Complimentary Afternoon Snack.....	12:15 AM–2:00 PM	C.....	Hall A, B1
Supplier Session.....	11:45 AM–1:15 PM.....	C.....	Hall B1

TECHNICAL DIVISION LUNCHEON

Light Metals Division Luncheon.....	12:00 PM–2:00 PM	M	Marina Ballroom F
Structural Materials Division Luncheon	12:00 PM–2:00 PM	M	Marina Ballroom D

SOCIAL FUNCTIONS

International Symposium on Gamma Titanium Aluminides Banquet.....	6:00 PM–9:00 PM	M	Cardiff
Yazawa International Symposium Informal Entertainment Event (by invitation only)	6:00 PM–9:00 PM		Offsite Venue

WORKSHOPS

Federal Funding Workshop	6:00 PM–8:00 PM	C.....	Room 1B
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COMMITTEE MEETINGS

TMS Board of Directors Meeting	7:00 AM–12:00 PM	M	Coronado
Acta Materialia Executive Committee	8:00 AM–5:00 PM	M	Executive Conference Room
Local Section Meeting	2:00 PM–3:30 PM	M	Del Mar
Lead-Zinc 2005 Organizing Committee Meeting	2:00 PM–5:00 PM	M	Warner Center

THURSDAY, MARCH 6, 2003

REGISTRATION	7:00 AM–10:00 AM	C.....	Hall A
TMS PUBLICATION SALES	7:00 AM–10:00 AM	C.....	Ground Level Lobby
TMS MEMBERSHIP AREA	7:00 AM–10:00 AM	C.....	Ground Level Lobby
SLIDE PREVIEW AREA	7:00 AM–12:00 PM	C.....	Room 6A
AUTHORS' COFFEE	7:00 AM–8:30 AM	C.....	Room 6A

SOCIAL FUNCTIONS

Acta Materialia Inc Board of Governors Luncheon.....	12:00 PM–1:30 PM	M	Carlsbad
Yazawa International Symposium Boat Cruise (by invitation only).....	1:00 PM–4:00 PM		Offsite Venue

COMMITTEE MEETINGS

Light Metals Subject Chairs Meeting/Breakfast.....	7:00 AM–8:30 AM	M	Oceanside
Acta Materialia Inc Board of Governors Meeting.....	8:00 AM–6:00 PM	M	Cardiff
Aluminum Executive Committee.....	8:30 AM–10:30 AM	M	Oceanside

Kick off the Week and Visit the Show!
Join the Exhibitors for a Hosted Welcoming Reception
Monday, from 5:00–6:00 PM

Attention all plant managers, cast shop supervisors and personnel, and anyone interested in the safety issues facing today's aluminum producing organizations.

Open your personal conference schedule with this vital session...

CAST SHOP SAFETY

A special opening presentation to the 2003 Cast Shop Technology Symposium

**Monday, March 3, 2003
San Diego Convention Center**

**Room 6C
8:30 AM**

Jointly sponsored by the Aluminum Committee of the TMS Light Metals Division and the Aluminum Association.

SPECIAL PROGRAMMING EVENTS

Materials Processing & Manufacturing Division's
Fourth Global Innovations Symposium:

ENERGY EFFICIENT MANUFACTURING PROCESSES

*Monday, March 3, 2003
San Diego Convention Center
Room 5A
8:30 AM*

Learn the latest technological improvements to enable you to achieve greater production efficiency while reducing energy consumption.

Increasing energy prices offer manufacturers an excellent incentive to improve productivity while decreasing production costs. Many times, making a process more energy efficient involves utilizing waste heat or other waste products, leading to a cleaner process as well. The goal of this forum is to explore process improvements that result in energy savings while producing an equal or better product with less waste. One obvious target for improvement is processes involving melting and heating, but all processes for shaping and forming raw materials into finished products are also very energy intensive. This symposium will cover manufacturing processes beginning at initial mineral extraction through packaging and shipping strategies. Some materials are melted several times throughout their processing cycle, and eliminating even one of these processes can result in substantial savings. Even less obvious materials processes and properties that can be improved for energy efficiency include wear, fatigue, hot-cracking, and corrosion of surfaces in manufacturing equipment and machine tools. Many such dies, rolls, cutting tools, and other equipment must be repaired or replaced regularly, and an extension of their useful life can be very cost effective and save significant energy. Near-net shape and additive processes that reduce the need for machining certainly increase energy efficiency as well. Manufacturing processes for metals, ceramics, polymers, electronic materials, and composites are certainly all available for improvements in energy efficiency, and all these materials are used for manufacturing other products.

STAY CONNECTED... AT THE TMS 2003 CYBER CENTER

While you're connecting with professionals in your field at the meeting, you don't have to miss your important e-mails. Send and receive e-mails at the Cyber Center.

**And it's
FREE!**

Located at the San Diego Convention Center in the Ground Level Lobby

The Cyber Center is sponsored by



When using the Cyber Center, click on the browser's "home" button to access a suite of at-meeting tools, including

- Attendee List
- Technical Program
- Personal Conference Scheduler
- On-Line Publication Ordering
- And More!

FEDERAL FUNDING WORKSHOP

Wednesday, March 5, 2003, San Diego Convention Center, Room 1B, 6:00 PM–8:00 PM

In this special workshop, representatives from the National Science Foundation (NSF), the U.S. Department of Energy (DOE), and the National Institute of Standards and Technology (NIST), will give presentations on current funding programs for materials research. Included will be an overview of current programs and initiatives, collaboration opportunities, tips for proposal writing, deadline information, and time for questions and discussion.

This free workshop is open to all attendees and may be worth the conference registration fee all by itself.

Planned presentations:

Partnership Opportunities with the DOE-EERE Industrial Technologies Program

Presenter: Sara Dillich, Lead Technology Manager Materials and Materials Processes – Industrial Technologies Program, Department of Energy (DOE)

The DOE-EERE Industrial Technologies Program partners with industry and other stakeholders to improve energy efficiency through cost-shared research and development. Through an open, competitive solicitation process OIT funds projects that target the largest opportunity to save energy in the United States industrial manufacturing sector. Program goals and opportunities will be discussed, including the identification, selection and funding of Grand Challenges: technical issues, which are complex but which, if solved, could increase energy efficiency and product yield significantly.

Current Funding Programs on Materials Research at the National Science Foundation (NSF)

Presenters: Lynette Madsen, Program Director of Ceramics & NSF-Europe Coordinator National Science Foundation – Division of Materials Research (DMR), Directorate for Mathematical & Physical Sciences (MPS)

Presenters: K.L. Murty, Program Director of Metals National Science Foundation – Division of Materials Research (DMR), Directorate for Mathematical & Physical Sciences (MPS)

NSF's mission as stated in the NSF Act of 1950 is to promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense. Materials science and engineering plays an important role in this mission and accounts for a significant portion of NSF's expenditures. These efforts are central to the Division of Materials Research (DMR), however significant funding of material research is supported in other areas of the foundation, e.g. in many areas of the Engineering (ENG) directorate, within Geosciences (GEO), and in other areas of Mathematical and Physical Sciences (MPS), such as Chemistry (CHE) and Mathematics (DMS). Materials research, often interdisciplinary in nature, finds prominence in many priority areas (e.g. nano) and special calls (e.g. a recent Dear Colleague Letter on sensors). Hand-in-hand with research is education, preparing the next generation of scientists, mathematicians and engineers, and accordingly support for educational activities goes well beyond the Directorate for Education and Human Resources. Activities on an international front can enhance our efforts and broaden our perspectives; the role of our International Science and Engineering Office in conjunction with MPS and ENG has recently resulted in increased emphasis in this arena (<http://www.nsf.gov/mps/divisions/dmr/research/start.htm>).

DOE-BES Programs in Materials Science and Engineering

Presenter: Harriett Kung, Program Manager, Division of Materials Science and Engineering – Office of Basic Energy Sciences Department of Energy (DOE)

This presentation will be an overview of the DOE's Office of Basic Energy Sciences (BES) supported research programs in materials sciences and engineering with an emphasis on activities and future funding opportunities in the Materials and Engineering Physics Team.

Materials Processing Opportunities in the NIST Advanced Technology Program

Presenter: Clare M. Allocca, Senior Scientific Advisor to the Director, Materials Science and Engineering Laboratory National Institute of Standards and Technology (NIST)

The NIST Advanced Technology Program (ATP) is a unique partnership between government and private industry to accelerate the development of high-risk technologies that promise significant commercial pay-offs and widespread benefits for the economy. This presentation will describe the program, as well as provide examples of past and potential accomplishments/opportunities within ATP in the area of materials processing, including engineered surfaces, innovative forming techniques, joining, and other areas. Opportunities to work with the NIST Measurements and Standards Laboratories will also be described.

GENERAL INFORMATION

The San Diego Marriott Hotel & Marina is the headquarters hotel. All conference events, including registration, technical sessions, and the exhibition take place at the San Diego Convention Center. Technical sessions for the Yazawa Symposium take place at the San Diego Marriott Hotel & Marina.

Registration Policy

All attendees and authors must register for the meeting. Non-member authors may register at the special non-member author rate. **Badges are required for admission to all technical sessions, the exhibition, and social functions.**

Registration

Registration is being held in Hall A in the San Diego Convention Center during the following hours:

<i>Sunday, March 2</i>	<i>11:00 AM–6:00 PM</i>
<i>Monday, March 3</i>	<i>7:00 AM–5:00 PM</i>
<i>Tuesday, March 4</i>	<i>7:00 AM–5:00 PM</i>
<i>Wednesday, March 5</i>	<i>7:00 AM–5:00 PM</i>
<i>Thursday, March 6</i>	<i>7:00 AM–10:00 AM</i>

Refund Policy

The deadline for all refunds was February 3, 2003. No refunds will be issued at the meeting. All fees and tickets are non-refundable after the February 3 deadline.



Americans with Disabilities Act

TMS strongly supports the federal Americans with Disabilities Act (ADA), which prohibits discrimination against, and promotes public accessibility for those with disabilities. In support of and compliance with this Act, we ask that those requiring specific equipment or services as an attendee of the TMS Annual Meeting, contact the TMS Meeting Services Department at the Registration Desk and advise of any specific requirements in advance.

TMS Publication Sales

Be sure to stop by the TMS Publications Sales booth in the Ground Level Lobby of the San Diego Convention Center. Examine and select from more than 150 proceeding volumes, textbooks, monographs, and CD-ROMS. Many selections are at reduced prices. Information on nearly all areas of minerals, metals, and materials technology are available during the following days and times:

<i>Sunday, March 2</i>	<i>11:00 AM–6:00 PM</i>
<i>Monday, March 3</i>	<i>7:00 AM–5:00 PM</i>
<i>Tuesday, March 4</i>	<i>7:00 AM–5:00 PM</i>
<i>Wednesday, March 5</i>	<i>7:00 AM–5:00 PM</i>
<i>Thursday, March 6</i>	<i>7:00 AM–10:00 AM</i>

NOTE: All attendees who pre-ordered concurrent proceedings volumes via the advance registration form received a ticket in their registration packet that should be presented at the designated pre-ordered book distribution desk at the TMS Publication Sales booth in the convention center. All pre-ordered books must be picked up on-site at the meeting, unless advance arrangements for shipment have been made and the appropriate shipping and handling fee is paid.

Business Service Center

Mail Boxes Etc. will provide business services for all 2003 TMS Annual Meeting attendees at the San Diego Convention Center. MBE, which is located in the Business Center on the Ground Level, will be open daily to help you with the following services:

- Photocopying
- Faxing
- Shipping
- Office Supplies – emergency sundries for sale including markers, paper, tape, pens, white-out, etc.

POSTER SESSION

A technical, noncommercial poster session will be held in conjunction with the 2003 TMS Annual Meeting.

Presentations will be displayed on 4x8-foot poster boards. No formal presentation is required. Individuals should refrain from the use of brand names and specific product endorsements.

The Poster Session will begin on Monday, March 3 and remain in place through Wednesday, March 5 at the San Diego Convention Center in Ballroom 6 Lobby.

AUTHORS' INFORMATION

Authors' Coffee

Attention speakers, session chairs, and organizers!

Your attendance is required on the day of your session in order to coordinate last minutes changes and to receive instructions before the presentations begin. Authors' coffee is held each morning, 7:00-8:30 AM at the San Diego Convention Center in Room 6A.

Slide Preview Area

Speakers may preview their slides before their technical presentations in the slide preview area located in Room 6A at the San Diego Convention Center. This area is available Monday, March 3 through Thursday, March 6. Arrangements must be made ahead of time to use and view special order equipment.

Technical Sessions

Technical sessions begin on Monday, March 3, 2003 and end on Thursday, March 6, 2003. Technical sessions are at the San Diego Convention Center, with the exception of the Yazawa Symposium which will be held at the San Diego Marriott Hotel and Marina.

Audio/Video Recording Policy

TMS reserves the right to any audio and video reproduction of all presentations at every TMS-sponsored meeting. Recording of sessions (audio, video, still-photography, etc.) intended for personal use, distribution, publication, or copyright without the express written consent of TMS and the individual authors is strictly prohibited. Contact the TMS Technical Programming Department to obtain a copy of the waiver release form.

About the San Diego Marriott Hotel & Marina

The San Diego Marriott Hotel & Marina is the city's largest and finest hotel. It is located just minutes from all the best of this international city, situated on San Diego Bay adjacent to the Convention Center. The hotel offers an abundance of amenities including five award-winning restaurants and lounges, a 446-slip marina, full service business center, two outdoor heated pools, health club, sauna, and six lighted tennis courts. Nearby are shopping, jogging trails, a city park, and miles of beaches. The shops and boutiques of San Diego's internationally famous Horton Plaza and Seaport Village are within walking distance. With all of this, the hotel offers its visitors a veritable wealth of things to do and see.

Shuttle Service

Shuttle service is provided to the convention center from the following hotels only: Holiday Inn on the Bay, Best Western, and Embassy Suites. The shuttle service is not responsible for items left on the buses. Also, no glass containers are permitted on the buses. The shuttle service is available beginning Monday, March 3, 2003 from 6:30AM to 9:30AM and 1:30PM to 6:00PM. This schedule will be followed for Tuesday, March 4 and Wednesday, March 5. Service on Thursday, March 6 will be available from 6:30AM to 12:30PM.

Guest Hospitality

A special guest hospitality area is hosted each day of the meeting from 7:00 AM–10:00 AM in the Oceanside Room of the San Diego Marriott Hotel & Marina. TMS sponsors a continental breakfast for the convenience of spouses and accompanying persons of meeting attendees. The Guest Hospitality Room is a good place to meet, socialize, and gather before tour departures.

Note: The Conference guest badge is intended for spouses and accompanying persons of registered attendees and for identification only. It does not permit access to technical presentations.

Employment Referral Board

An employment referral board is located at the TMS Membership area. Attendees may leave their resumes and employers may post job openings.

FUTURE TMS ANNUAL MEETING SITES

TMS Annual Meeting & Exhibition

More than 1,200 technical presentations and 30,000 square feet of exhibitions detail the latest advances and most critical developments in minerals, metals, and materials science and technology.

2004	Charlotte, NC	March 14–18.....	Charlotte Convention Center
2005	San Francisco, CA	February 13–17	Moscone West Convention Center
2006	San Antonio, TX	March 12–16.....	San Antonio Convention Center
2007	Anaheim, CA	February 11–15.....	Anaheim Convention Center

Hope to see you there!

HONORS & AWARDS

Congratulations to the 2003 TMS Award Winners!

FELLOW CLASS OF 2003

Didier DeFontaine, University of California
George Krauss, Colorado School of Mines
Hans Conrad, North Carolina State University
William L. Johnson, California Institute of Technology
Robert H. Wagoner, The Ohio State University

APPLICATION TO PRACTICE AWARD

James C. Williams, The Ohio State University

JOHN BARDEEN AWARD

Gerald B. Stringfellow, University of Utah

BRUCE CHALMERS AWARD

Kenneth A. Jackson, University of Arizona

EDUCATOR AWARD

Robert A. Rapp, The Ohio State University

ROBERT LANSING HARDY AWARD

John Ballato, Clemson University

INSTITUTE OF METALS/ ROBERT FRANKLIN MEHL AWARD

Colin Humphreys, University of Cambridge

CHAMPION H. MATHEWSON AWARD

Fabrice Patisson, Ecole des Mines
Etienne Lebas, Institute Francais du Petrole
Francois Hanrot, IRSID
Denis Ablitzer, Ecole des Mines
Jean-Léon Houzelot, Ecole Nationale Supérieure
des Industries Chimiques

ACTA MATERIALIA GOLD METAL AWARD

Gareth Thomas, University of California at Berkeley

Technical Division Award Winners

ALUMINUM DISTINGUISHED SERVICE AWARD

Wayne Hale, Kennecott Minerals Co

EXTRACTION & PROCESSING LECTURER

Kenneth N. Han, South Dakota School of Mines and Technology

EXTRACTION & PROCESSING SCIENCE AWARD

Tamas Kekesi, University of Miskolc
Masahito Uchikoshi, Fine Metals Corp.
Kouji Mimura, Tohoku University
Minoru Isshiki, Tohoku University

EXTRACTION & PROCESSING

TECHNOLOGY AWARD

Stephen C. Britten, Mars and Company
Uday B. Pal, Boston University

LIGHT METALS TECHNICAL SERVICE AWARD

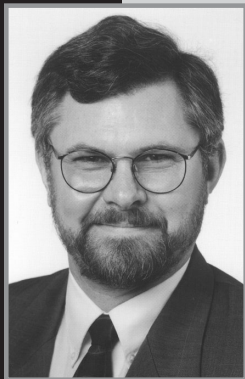
Halvor Kvande, Hydro Aluminium Metal Products

LIGHT METALS AWARD

Marc Bertherat, Aluminum Dunkerque
Thierry Odievre, Pechiney Research Center
Michel Allibert, Centre Nationale De La Research Science
Pierre LeBrun, Pechiney Grp

STRUCTURAL MATERIALS DISTINGUISHED SCIENCE/ENGINEER AWARD

Marc A. Meyers, University of California, San Diego



John E. Allison
2002 TMS President



Dan J. Thoma
2003 TMS President

132nd TMS Dinner and Awards Presentation With Installation of 2003 TMS President

The Annual TMS Dinner and Awards Presentations will be held at 7:00 pm, Tuesday, March 4, 2003 at the San Diego Marriott Hotel and Marina in the Marina Ballroom F & G. The highlight of the TMS Annual Meeting will begin with a cash bar reception at 6:00 pm and dinner at 7:00 pm. A presentation and recognition of the Society and Technical Division award recipients will be followed by the annual address to the Society by 2002 President John E. Allison, who will then introduce Dan J. Thoma, the 2003 President.

Dr. Dan J. Thoma received his BS degree in Metallurgical Engineering from the University of Cincinnati. During that time, he worked at NASA-Lewis Research Center in Cleveland, Ohio. He continued his education at the University of Wisconsin-Madison, where he received his MS and PhD in Metallurgical Engineering. Dr. Thoma has been employed at Los Alamos National Laboratory since 1992, where he is currently the team leader and project leader for Alloy Design and Development within the Metallurgy Group in the Materials Science and Technology Division.

Dr. Thoma is a currently a member of TMS, ASM, MRS, and ACerS. Within TMS he has served two terms on the Board of Directors as Programming Director. In addition, he is the past chair of the Solidification Committee and serves on the Powder Materials Committee and the Nuclear Materials Committee. He has also served on the Education Committee and MPMD Council.

Banquet tickets are \$60 and may be purchased at the TMS Conference Registration Desk. Tickets will NOT be sold at the door.

INSTITUTE OF METALS LECTURE & ROBERT F. MEHL MEDALIST

Monday, March 3, 2003, San Diego Marriott Hotel & Marina,
Marina Ballroom D, 12:00 PM–2:00 PM

Designing Materials: From Turbine Blades to Brilliant Light Emitting Diodes

Colin Humphreys, University of Cambridge



Colin Humphreys

About the topic: Our understanding of physics, chemistry, and materials science is now sufficiently good that we can increasingly design and create man-made materials to meet specific needs. This lecture will focus on two very different examples of materials design. The first concerns complex, multi-element structural materials for turbine blades for power plant, which are too complex to be designed from first principles. The second shows how we can design, from first principles, new semiconductor materials and devices based on gallium nitride. These devices have a huge range of applications, from traffic lights to home and office lighting to medical. Both examples illustrate the huge economic importance of designing new and improved materials, and also both examples demonstrate how materials science can be used to reduce global warming.

About the presenter: Colin Humphreys is the Goldsmith's Professor of Materials Science at the University of Cambridge since 1990. He also serves as the Director of the Rolls-Royce-Cambridge University Technology Center in Gas Turbine Alloys and also the Research Director of the Joint UK-Japan International Research Program on Atom Arrangement, Design, and Control for New Materials. He received his B.Sc in physics, at the Imperial College, London and his M.A. from Oxford University and Ph.D. from Cambridge University.

Prof. Humphreys has conducted creative and original work on semi-conductors, ceramic super-conductors and inter-metallic compounds and has received eight awards recognizing his contributions to the field of materials science. He was awarded the Rosenhain Medal and Prize of the Institute of Metals in 1989. He was Selby Fellow of the Australian Academy of Science in 1997 and is a member of Academia Europaea.

He is the author of more than 350 publications and is a member of 10 UK National committees in the materials field. His breadth of knowledge of materials research is reflected in his presence on the Editorial Board of seven high quality international journals, including Journal of the Physics and Chemistry of Solids and the Journal of Materials Science – Materials in Electronics.

One of Prof. Humphreys particular skills is the communication of the excitement and creativity in materials science to young people. He is currently Fellow in the Public Understanding of Physics at the Institute of Physics and is a member of the BBC's Independent Advice Panel on Engineering and Technology Programs. He has appeared on television and radio many times to promote science and engineering.

EXTRACTION & PROCESSING DIVISION DISTINGUISHED LECTURER

Tuesday, March 4, 2003, San Diego Marriott Hotel & Marina
Marina Ballroom D, 1:45 PM–2:30 PM

The Interdisciplinary Nature of Hydrometallurgy

Kenneth N. Han, South Dakota School of Mines and Technology



Kenneth N. Han

About the topic: Hydrometallurgical extraction of metals is an important widely-practiced technology in the metallurgical industry for treating both primary and secondary resources of valuable metals.

Successful hydrometallurgical approaches to metal extraction require full understanding of a wide spectrum of scientific and engineering principles in many disciplines. These include solution chemistry, electrochemistry, thermodynamics, kinetics, transport processes and, frequently, biology.

In this paper, intricate relationships among various disciplines influencing hydrometallurgical extraction are reviewed and analyzed with pertinent examples. The effect of operating parameters on the overall extraction strategy are examined and discussed.

About the presenter: Dr. Kenneth N. Han is the Regents Distinguished Professor and Douglas W. Fuerstenau Professor in the Department of Materials & Metallurgical Engineering at the South Dakota School of Mines and Technology (SDSM&T). He was with the Department of Chemical Engineering, Monash University, Melbourne, Australia from 1971-1980. In 1981, he joined SDSM&T. He was head of the Department of Metallurgical Engineering from 1987-94 and dean of the College of Materials Science and Engineering from 1994-99.

His research interests include hydrometallurgy, interfacial phenomena, metallurgical kinetics, solution chemistry, fine particle recovery, and electrometallurgy. He has directed over 70 graduate students and post-doctorate researchers, published more than 150 papers in national and international journals, and presented more than 100 papers at international conferences. He is an author of 10 monographs and holds eight patents in the area of extractive metallurgy.

In 1987, Dr. Han received the Presidential Professor Award from SDSM&T. In 1994, he received the Ernest L. Buckley Award, a South Dakota State Governor's Award for his industrial research efforts. He received the Milton E. Wadsworth Award and the Arthur F. Taggart Award from the Society of Mining, Metallurgical and Exploration in 1995. In 1997, he received the Distinguished Alumni Award from the College of Engineering of SNU. He became an SME Distinguished Member in 1998. In 1998, he was awarded the Excellence in Research by the SD Board of Regents. In 2000, he received the AIME Mineral Industry Education Award and in 2002, the Robert H. Richards Award from AIME.

Dr. Han was inducted into the National Academy of Engineering in 1996. He has been a foreign member of the National Academy of Engineering of Korea since 1998 and was inducted to the Korea Academy of Science and Technology in 1999.

SPECIAL LECTURES/LUNCHEONS/DINNERS

YOUNG LEADERS EXTRACTIVE METALLURGY TUTORIAL

Monday, March 3, 2003, San Diego Marriott Hotel & Marina
Cardiff Room, 12:00 PM–1:30 PM

“Doing Science for Fun and National Security”

Presented by: Alan Hurd, Group Leader, Los Alamos National Laboratory



Alan Hurd

About the topic: Ambitious people want to make a difference, and they want to enjoy their careers. For some, financial impact in industry satisfies both needs; for others, teaching the next generation is the answer. In the post-9-11 era, hundreds of early career scientists and engineers discover each year that national security research at the national labs is a rewarding career path offering great intellectual diversity, challenge, and excitement. This presentation will discuss the mission of Los Alamos National Lab in the current world order and how one physicist came to appreciate national security research.

About the presenter: At Los Alamos National Laboratory, Dr. Hurd is the Director of the Manuel Lujan Jr Neutron Scattering Center and Group Leader of LANSCE-12, the neutron scattering group. Prior to February 2001, he worked at Sandia National Laboratories where he managed a department that combines catalysis and soft matter research. Before joining Sandia in 1984, he taught physics at Brandeis University, arriving there in 1981 to do postdoctoral research in liquid crystals. His degrees are in physics from Colorado School of Mines and the University of Colorado, where he was a National Science Foundation Fellow. Currently, he is an adjunct professor of physics at the University of New Mexico and a member of their Center for Advanced Studies and Center for Micro-Engineered Ceramics.

Optional box lunch for \$25 may be purchased at the TMS Conference Registration Desk. Tickets will NOT be sold at the door.

LIGHT METALS DIVISION LUNCHEON

Wednesday, March 5, 2003, San Diego Marriott Hotel & Marina
Marina Ballroom F & G, 12:00 PM–2:00 PM

“The Future of Aluminium of Automotive Engines”

Presented by: Dr. Dieter Braun, Hydro Aluminium Automotive



Dr. Dieter Braun

About the topic: The growing demands on the safety, comfort, performance and environmental compatibility of passenger vehicles have led to an enormous increase in vehicle weight. For this reason, the development of lightweight designs with regard to vehicle construction and material substitution is of ever-greater importance. Material substitution plays a major role, especially in the engine. By substituting aluminium casting alloys for cast iron - the material traditionally used for cylinder heads and engine blocks - the weight of a medium-sized European car engine can be reduced by 30 - 35kg. Modern, high-performance petrol and diesel engines made from aluminium have to meet high specific requirements for cylinder heads and engine blocks. Solutions to important technological questions have been developed, allowing the increased use of aluminium for motor vehicle engines in the future. From 2005 onwards, more aluminium engine blocks than cast iron engine blocks will likely be used in Western Europe. With regard to cylinder heads, this substitution process of aluminium for cast iron has largely been completed in Europe.

About the presenter: Dr. Braun has been a Member of Board for VAW aluminium AG since 1996. He has been employed with VAW for 22 years in various capacities beginning with the Inorganic Chemistry Section; Anorganic Chemistry Section, R&D; Head of the Chemistry Department; Head of the Corporate Environmental Protection Department, General Agent; Authorized signatory; Head of Sales, Specialty Alumina Division; Head of the Specialty Alumina Division; Head of the Engine Castings Division; Managing Director, VAW motor GmbH; and serving most recently as Executive Manager.

Having been responsible for VAW's Automotive Products from 1997 to July 2002, Dr. Braun - with VAW's integration into Hydro - was appointed and is currently serving as President for the Hydro Aluminium Automotive Business Sector.

Dr. Braun was born in Plaidt, Germany. He served in the Military until 1970 then completed his Masters' degree in Chemistry at Giessen University in 1976. He completed his PhD in Natural Sciences in 1979 and earned an Advanced Management Program at INSEAD in 1991.

Luncheon tickets are \$30 and may be purchased at the TMS Conference Registration Desk. Tickets will NOT be sold at the door.

EXTRACTION & PROCESSING DIVISION LUNCHEON

Tuesday, March 4, 2003, San Diego Marriott Hotel & Marina
Marina Ballroom E, 12:00 PM–1:45 PM

“Developments in the Processing of Nickel Ores and Concentrates”

Presented by: **Dr. Wm. Gordon Bacon, Vice President,
Technology and Engineering, Inco Ltd.**



Dr. Wm. Gordon
Bacon

About the topic: There have been significant developments in the exploitation of nickel ores and concentrates the last decade that will reform nickel production in the near future.

About the presenter: Gord Bacon graduated with a B. A. Sc. In Mineral Processing Engineering (1967) and a Ph.D. in Metallurgical Engineering (1979), both from UBC in British Columbia in Canada.

His early career was in the potash and copper industries with IMCC Corp and Kennecott respectively. He then founded Bacon Donaldson and Associates Ltd.; a Vancouver, B.C. Canada based firm. This firm is a consulting metallurgical firm providing physical and extractive metallurgical services to the resource industries around the world. He was president and senior partner for twenty-one years. During this period he was an Adjunct Professor in the Metals and Materials Engineering and Minerals Engineering Departments at the University of British Columbia for 10 years.

Dr. Bacon is a Professional Engineer in B.C., Alberta and Ontario, Canada and a Fellow of the Institute of Mining and Metallurgy in England.

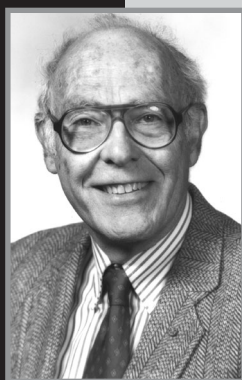
*Luncheon tickets are \$30 and may be purchased at the
TMS Conference Registration Desk. Tickets will NOT be sold at the door.*

STRUCTURAL MATERIALS DIVISION LUNCHEON

Honoring John Cahn on being named the recipient of the
Franklin Institute's 2002 Bower Award and Prize for Achievement in Science

Wednesday, March 5, 2003, San Diego Marriott Hotel & Marina
Marina Ballroom D, 12:00 PM–2:00 PM

Featuring a presentation by **Dr. Cahn of his award lecture:**
*“Revolutions at the Crossroads – Interdisciplinary Opportunities
For Making Scientific Advances”*



John W. Cahn

About the topic: When ideas from one field are tested in a quite different context, success enlarges the idea and leads to consilience; whereas failure leads to creation of new paradigms or even to scientific revolutions. Materials science, a recently created “interdisciplinary discipline,” is full of such idea transfers at the crossroads between its component disciplines. A range of examples are traced from their long pre-science history in ancient craft knowledge, ancient philosophy, and medieval scholarship, and finally to their disparate and often unreconciled modern roots in physics, chemistry, crystallography, mathematics, the materials disciplines of metallurgy, ceramics and polymers, and engineering.

About the presenter: John Cahn's research interest is in the development of principles needed for materials science, with emphasis on microstructure evolution. He has published about 250 papers. He is a Senior Fellow at the Materials Science and Engineering Laboratory of the National Institute of Standards and Technology (formerly NBS) in Gaithersburg, Maryland, where he has been for 26 years. He received his B.S. in Chemistry in 1949 from the University of Michigan, and his Ph.D in Physical Chemistry in 1953 from the University of California at Berkeley. He holds honorary doctorates from Northwestern University and Université d'Evry in France.

Prior to coming to NBS, he held positions at the University of Chicago's Institute for the Study of Metals (now the James Franck Institute), at the GE Research Laboratory during the Hollomon era in the group founded by David Turnbull. From 1964 until 1978 he was a Professor of Metallurgy at MIT. In 1960 he was awarded a Guggenheim fellowship, which he spent at Cambridge University. He has been a visiting professor in Sweden, Israel, and Iran, and since 1984 an affiliate professor jointly in physics and materials engineering at the University of Washington in Seattle.

*Luncheon tickets are \$30 and may be purchased at the
TMS Conference Registration Desk. Tickets will NOT be sold at the door.*

*In conjunction with the symposium: **Dynamic Deformation: Constitutive Modeling, Grain Size, and Other Effects: Symposium in Honor of Professor Ronald W. Armstrong***
RONALD ARMSTRONG HONORARY DINNER

Monday, March 3, 2003, San Diego Marriott Hotel & Marina, Green Room, 6:00 PM–9:30 PM

Sponsored by: TMS Structural Materials Division and ASM International:

Materials Science Critical Technology Sector, Jt. Mechanical Behavior of Materials

This symposium is organized to honor the work of Professor Ron Armstrong. The focus is on the dynamic behavior of materials, with emphasis in areas in which Prof. Armstrong has made in seminal contributions: constitutive equations and grain-size effects.

Dinner tickets are \$60.00 and may be purchased at the TMS Conference Registration Desk. Tickets will NOT be sold at the door.

*In conjunction with the symposium: **The Mike Meshii Symposium on Electron Microscopy: Its Role in Materials Research***
MIKE MESHII HONORARY DINNER

Monday, March 3, 2003, San Diego Marriott Hotel & Marina, Del Mar Room, 6:00 PM–9:30 PM

Sponsored by: TMS Structural Materials Division and ASM International: Materials Science

Critical Technology Sector, Jt. Mechanical Behavior of Materials

Electron microscopy has played a critical role in advancing the materials science paradigm. The Mike Meshii Symposium is intended to capture the current research activities and to assess the state-of-the-art the use of electron microscopy to solve problems in materials science and engineering.

Dinner tickets are \$60.00 and may be purchased at the TMS Conference Registration Desk. Tickets will NOT be sold at the door.

*In conjunction with the symposium: **Yazawa International Symposium on Metallurgical and Materials Processing: Principles and Technologies***
WELCOMING RECEPTION

Sunday, March 2, 2003 ■ Off-site venue ■ Reception is by invitation only

AKIRA YAZAWA HONORARY DINNER

Monday, March 3, 2003, San Diego Marriott Hotel & Marina, Marina Ballroom G, 6:00 PM–9:30 PM

Sponsored by: TMS Extraction & Processing Division, Aqueous Processing Committee, Copper,

Nickel, Cobalt Committee, Process Fundamentals Committee, Lead and Zinc Committee,

Pyrometallurgy Committee

This symposium is organized to share and discuss recent developments in physical chemistry of metallurgical processes and physicochemical principles involved in materials processing. These are the subjects of the lifetime work of Professor Akira Yazawa in whose honor this symposium is named.

Tickets will NOT be sold at the door.

INFORMAL ENTERTAINING EVENT (BARBECUE/KARAOKE)

Wednesday, March 5, 2003 ■ Off-site venue ■ Event is by invitation only

BOAT CRUISE

Thursday, March 6, 2003 ■ Off-site venue ■ Boat Cruise is by invitation only

*In conjunction with the symposium: **3rd International Symposium on Gamma Titanium Aluminides***
ISGTA-3 BANQUET

Wednesday, March 5, 2003, San Diego Marriott Hotel & Marina, Cardiff Room, 6:00 PM–9:30 PM

Sponsored by: TMS Structural Materials Division

The 3rd International Symposium on Gamma Titanium Aluminides (ISGTA-3) will provide a forum to share the progress and achievements toward application of gamma TiAl alloys, with emphasis on results made since the ISGTA-2 conference.

Banquet tickets are \$60.00 and may be purchased at the TMS Conference Registration Desk. Tickets will NOT be sold at the door.

ALUMNI RECEPTIONS

Alumni of the following universities are invited to gather and renew old acquaintances while meeting new ones. All of the alumni receptions will be located at the San Diego Marriott Hotel & Marina during the following times:

MONDAY, MARCH 3, 2003

*Michigan Tech University –
Materials Science
& Engineering
Laguna Room
6:30 PM–8:00 PM*

*Purdue University
Carlsbad Room
6:30 PM–8:00 PM*

Grab a Bite of Lunch!

Use the discount coupon in your badge packet for \$1 off Lunch Concessions in the Exhibit Hall

Barbeque, Mexican and Greek Specialties Featured

The organizers of the Yazawa International Symposium on Metallurgical and Materials Processing: Principles and Technologies wish to thank the following co-sponsors:

Society Co-Sponsors:

ASM International
Asociacion Argentina de Materiales/Materials Research Society of Argentina
Associacao Brasileira de Metalurgia e Materiais
Associazione Italiana di Metallurgia
Australasian Institute of Mining and Metallurgy
Chinese Metals Society
Czech Society for New Materials and Technologies
Dansk Metallurgisl Selskab/Danish Metallurgical Society
Deutsche Gesellschaft fuer Materialkunde
Federation of European Materials Societies
Finnish Association of Mining and Metallurgical Engineers
Institute of Materials (UK)
Institution of Mining and Metallurgy
Instituto Argentino de Siderurgia
Instituto de Ingenieros de Minas de Chile
Iron and Steel Institute of Japan
Iron and Steel Society
Japan Institute of Metals
Korean Institute of Metals & Materials
Metallurgical Society CIM
Mining and Materials Processing Institute of Japan
Non-ferrous Metals Society of China
Slovak Metallurgical Society
Slovensko drustvo za materiale/Slovenian Society of Materials
Societe Francaise de Metallurgie et de Materiaux
Society for Mining, Metallurgy and Exploration
South African Institute of Mining and Metallurgy

Company Co-Sponsors:

Dowa Mining Co., Ltd.
FLOGEN Technologies Inc.
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Mitsubishi Materials Corp.
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Nippon Mining & Metals Co., Ltd.
Outokumpu Oyj, Finland
Sumitomo Metal Mining Co., Ltd.
Toho Zinc Co., Ltd.

Independent Publishers:

European Journal of Mineral Processing and Environmental Protection

Have a Snack!

Redeem your Coupon for hosted Snack,



sponsored by **ALMEX USA, INC.**

Wednesday, March 5th ■ 12:15–2:00 PM

Redeemable at stations throughout the Exhibit Hall

STUDENT INFORMATION

The 2003 TMS Annual Meeting offers students, interested in materials science and engineering, a variety of opportunities to gather technical information, explore career possibilities, and network with students and professionals in the field.

5th Annual TMS Student Poster Session

This students-only Poster Session will be held in conjunction with the 2003 TMS Annual Meeting & Exhibition. Presentations will be displayed on 4' by 4' poster boards; no formal presentation is required. The Poster Session will begin Monday, March 3 and remain in place through Wednesday, March 5 at the San Diego Convention Center in Ballroom 6 Lobby. Annual Meeting attendees will have the opportunity to vote for the "Best Poster," with the winning poster receiving \$500.

TMS Student Chapters – Don't forget to select a representative and submit the TMS Travel Reimbursement Program form and travel receipts, granting each chapter up to \$500 per calendar year to send student(s) to TMS conferences!

Student Session Monitors

Students will have the opportunity to partially defray their conference expenses by serving as session monitors. Monitors are responsible for assisting the session chair, recording session attendance, and assisting with audio/visual equipment. All monitors must report to Authors' Coffee each morning they are scheduled to monitor sessions. Each monitor must check in to obtain the session sheets and then report to the assigned table to meet with the speakers and session chairs. Authors' coffee begins at 7:00 AM in Room 6A at the San Diego Convention Center. Monitors positions are limited and will be assigned on a first-come basis. Monitors who do not check in before 8:00 AM will have their session reassigned. Any students wishing to monitor who have not previously completed a work form, may report to authors' coffee by 8:00 AM.

Finding a Job in a Tough Economy

Date: Sunday, March 2, 2003

Location: San Diego Marriott Hotel and Marina

Room: Marina Ballroom D; **Time:** 1:00 PM–2:30 PM

Presenter: Neil Murray—University of California—San Diego

Sponsored by: The TMS Foundation

You've heard about how bad the economy is. How will it affect you? It may take you longer to find a job for the summer or after graduation. So start planning your job search strategies now, and attend this workshop to learn how to use job listings creatively, how to network smarter, how to approach companies directly—and more! We can't promise you a job, but this workshop will get you up and running.

TMS Student Career Forum

Date: Sunday, March 2, 2003

Location: San Diego Marriott Hotel and Marina

Room: Laguna; **Time:** 3:00 PM–5:00 PM

Presenters include: Nik Chawla – University of Arizona,

Iver Anderson – Iowa State University, Ellen Cerreta – Los Alamos National Labs

Pursuing an appropriate career path is an important task of any metals and materials student. The TMS Student Career Forum will address the many pertinent issues that face students today. Key industry figures will provide personal insight on preparation strategies, and tips on how to develop and foster a rewarding career. The speakers will also address questions from participating students during this interactive session.

TMS Networking Mixer

Date: Sunday, March 2, 2003

Location: San Diego Marriott Hotel and Marina

Room: Marina Ballroom D; **Time:** 8:00 PM–10:30 PM

Sponsored by: TMS Student Affairs Committee

Attend an event that just might open the door to endless career possibilities. This networking mixer is intended to provide a relaxed, casual, and fun atmosphere for students, faculty, government, and industry officials to make connections and to share their experiences of professional growth. Don't miss out on this excellent opportunity to make the connections you need to succeed.

Beer*, soft drinks, snacks, and music will be provided. Students are encouraged to show their school pride by wearing their school's colors.

***Note:** In accordance with the California State Law, alcoholic beverages will be served only to attendees who are 21 years of age or older; proper photo ID with birth date must be presented upon entry.

Donate A Door Prize for the TMS Networking Mixer!

Student Chapters are asked to use their creativity and donate a door prize item. TMS will also be donating items. The more prizes donated, the better your chance to win!

Student Chapter School Displays

Check out the school displays in the exhibit hall during the TMS Annual Meeting Exhibit. Student Chapters will display their chapter's activities, research projects, & school information. Booths will be judged & the best booth will win a cash prize.

Are You A Student Member?

Student members of TMS may attend the technical sessions, exhibits, and lectures held Monday through Thursday on a complimentary basis. Registration for students who are not members is \$25, which will be applied toward a TMS Student Membership in 2003.

Young Leaders Business Meeting and Reception

You are invited to attend the TMS Young Leaders Business Meeting on Sunday, March 2 from 12:30 pm – 2 pm in Carlsbad Room and the TMS Young Leaders Reception on Sunday, March 2 from 5:00 pm – 6:00 pm in Marina Ballroom D, both at the San Diego Marriott Hotel & Marina.

TMS 2003 EXHIBITION

San Diego Convention Center, Halls A & B1

SHOW DATES AND TIMES:

Monday, March 3, 2003 12:00 Noon – 6:00 PM
 Tuesday, March 4, 2003 9:30 AM – 5:30 PM
 Wednesday, March 5, 2003 9:30 AM – 3:00 PM

Special Attractions during the 2003 Exhibition:

Grand Opening Reception—An opportunity to visit the booths while enjoying a hosted reception

Monday 5:00 PM–6:00 PM

Wednesday Snack—Join us in the exhibit hall for a soft pretzel sponsored by Almex, booth #1215, and see the show!

Wednesday 12:15 PM–2:00 PM

Hosted Coffee Breaks will be held in the Exhibit Hall during the morning and afternoon break in technical session schedule.

Plan to visit the Lunch Café Area in the Exhibit Hall:

- Open during show hours
- Featuring specialty foods including Barbeque, Mexican and Greek specialties
- Use the one dollar discount coupon in your badge packet for savings on lunch.



ALPHABETICAL LISTING OF EXHIBITORS

Company	Booth Number	Company	Booth Number	Company	Booth Number
ABB Inc.....	407	Hertwich Engineering.....	932	NORSMELT.....	820
Alcan Alesa Technologies Ltd.....	414	Hitachi High Tech America Inc.....	533	North American Mfg Co Ltd.....	1015
Aleastur.....	400	HMR Hydeq.....	1114	Northwest China Advanced Materials Co Ltd.....	830
Allied High Tech Products Inc.....	520	Holton Machinery Ltd.....	923	Opsis Inc.....	600
Almeq Norway AS.....	800	Hönnun.....	1111	Outokumpu/Aisco Systems Inc.....	821
ALMEX USA Inc.....	1215	Hysitron.....	705	Parker Hannifin.....	1020
Altech and Partners.....	1111	INDUSTRI-TEKNIK Bengt Fridh AB.....	1111	Pechiney Group.....	813
Aluminium International Today.....	615	Industrial Heating Magazine.....	431	Process Engineering Resources Inc.....	921
Aluminium Intl Journal.....	606	innovatherm GmbH+Co.KG.....	715	Polytec PI Inc.....	1031
Aluminium Times.....	1121	Intl Magnesium Association.....	630	Port of Longview.....	534
American Pulverizer/Hustler Conveyor.....	933	Jayne Industries.....	1029	Precimeter Inc.....	1111
Anter Corporation.....	323	JOM.....	808	Premelt Systems Inc.....	818
AUMUND Foerdertechnik GmbH.....	317	J T Thorpe & Son.....	931	Procedair Industries.....	621
B&P Process Equipment Systems LLC.....	301	Jünger+Gräter GmbH Feuerfestbau.....	521	Pyrotek Inc.....	401
BDH Industries Inc.....	422	Kabert Industries.....	1018	R&D Carbon.....	521
BHA Group Inc.....	804	KB Alloys Inc.....	614	Rafhönnun.....	1111
Bloom Engineering.....	608	KBM Affilips BV.....	423	RAG Trading GmbH.....	521
BMP Bi-Metal Products.....	1223	KEMPE International.....	300	Resco Products.....	307
Boreal Laser.....	1111	KHD Aluminium Technology GmbH.....	821	Rex Roto Corporation.....	1105
Borgestad Fabrikker AS.....	728	L P Royer Inc.....	1034	Riedhammer GmbH.....	706
Brochot.....	635	Laeis Bucher GmbH.....	521	Rigaku.....	415
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C&L Development Corp.....	830	Light Metal Age.....	518	Saint Gobain Industrial Ceramics.....	814
C.A. Picard Intl.....	829	LMI Selcom.....	515	Selee Corporation.....	801
Canadian Overhead Handling Inc.....	834	LOI Inc.....	428	SERMAS Industrie.....	420
Clayburn Industries Ltd.....	529	Los Alamos National Laboratory.....	1123	Services Lavigne & Baril Inc.....	303
CMI Novacast Inc.....	321	Lurgi Metallurgie GmbH.....	821	SETARAM.....	1128
Cometals.....	711	M Brashem Inc.....	617	Silver Needle Inc.....	1028
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Deutsche Gesellschaft für Materialkunde.....	1213	Metal Bulletin.....	535	SUB (Slovakce strojirni).....	1111
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Hencon BV.....	828			Wienalco.....	929
Hereaus Electro-Nite Co.....	1117			Zircar Ceramics Inc.....	602

SUPPLIER PRESENTATION SESSIONS

SESSION 1:

Tuesday, March 4, 2003

11:45 AM

CONTINUOUS ANNEALING OF CU AND AL STRIP IN A FLOATING STATE

Don Martosko,
Techint Technologies Inc,
100 Corporate Center Drive,
Coraopolis, PA, 15108-3185

This annealing process delivers superior metallurgical quality over conventional heat treat systems. With low strip tension, the material passes in transverse waves through the furnace in a "floating" state, using a strategically placed high velocity jet heating air circulation system. The speed of the treatment gives excellent and uniform crystallization, higher yield and tensile strengths, and better elongation than is obtained in conventional systems.

The features of this system also include low operating costs, rapid heating and cooling of material, uniform thermal processing, enhanced buckling resistance, no formation of "sea gull wings", no scratches or wrinkles, tracking that is free from vibrations and fluttering, and a finished product that is very clean and bright. The consistency of these mechanical properties is more difficult to obtain with conventional furnaces.

Depending on strip width, copper strip treatment accommodates gauges down to 0.0013", line speeds of 16-650 ft/min., and throughputs of 1-22 TPH. Aluminum strip treatment accommodates gauges down to 0.001", line speeds of 32-650 ft/min, and throughputs of 1-32 TPH.

Make plans to attend these featured presentations conducted by the TMS 2003 Exhibitors.

Presentations will feature in-depth information on new technologies, equipment and processes shown on the show floor.

Location: Presentation Areas Inside Hall B1

Times: Tuesday and Wednesday ■ 11:45 AM to 1:45 PM

12:15 PM

AUTOPAK - TOTAL AUTOMATION FOR D.C. SLAB CASTING

John V. Griffin, Pechiney Aluminium
Engineering, Inc.,
333 Ludlow Street,
Stamford, CT 06902

Pechiney Aluminium Engineering has built on 20 years of continual improvements and advancements in automatic slab casting technology to develop the "AUTOPAK".

Technology Concept

The Pechiney "AUTOPAK" technology is a complete automotive casting package consisting of "state-of-the-art" process equipment and a total integrated management and information system. The "AUTOPAK" process provides the cast house team with greater control over the operational casting station parameters; from the holding furnace(s) to the D.C. casting machine.

12:45 PM

CSE4 EDUPACK – A COMPLETE TEACHING RESOURCE FOR MATERIALS EDUCATION

Anthony Osborn, Sales Manager –
Worldwide Education Sales,
Granta Design Ltd, Unit 300, Rustat House,
62 Clifton Rd, Cambridge, CB1 7EG,
United Kingdom

The principles underlying CES4 EduPack are those developed by Professor Mike Ashby at Cambridge University, England for the teaching of materials. Using Ashby charts as a basis, students have a tool they can immediately start to use in their role as engineers.

CES4 EduPack comes as a complete teaching solution – including books, lecture notes and additional teaching resources. These are specifically designed to meet a variety of course requirements and are supplied at three levels. These levels excite and inspire students from the freshman year through to senior year and graduate level – where materials information is displayed at the same level of complexity as for the full commercial database.

1:15 PM

OVERVIEW OF STAS FLUXING TECHNOLOGIES

Dominique Prive,
STAS,
1846 Outarde, Chicoutimi, PQ,
G7K 1H1, Canada

Metal quality is continually improving for a wider and wider range of alloys and products. Fluxing is a common term used to describe a variety of cleansing operations including degassing, alkaline removal and inclusion removal. STAS, being a leader in fluxing technologies, is able to provide options for treating molten metal at various stages in the production process. A brief overview of available equipment together with their application will be followed by supporting data illustrating the metallurgical improvements which can be achieved under a wide range of conditions for each of these equipments. They include the Treatment of Aluminium in a Crucible (TAC); Furnace Fluxing including the Rotary Flux/Gas Injectors (RFI/RGI); Degassers including the Alcan Compact inline Degasser (ACD); Filters including CFFs and Deep Bed Filters (ABFs).

1:45 PM

REGENERATIVE THERMAL OXIDATION FOR NON-CONVENTIONAL APPLICATIONS AND CHLORINATED GASEOUS EMISSIONS

G. Drouin, J.O. Gravel and E. Le Couedic,
Biothermica Technologies Inc.,
426 Sherbrooke East, Montreal, Quebec,
H2L 1J6 Canada

The Biotox® Regenerative Thermal Oxidation (RTO) from Biothermica Technologies Inc. is a method used to treat and eliminate up to 99.9% non-conventional emissions containing various gaseous compounds. These gaseous emissions include pollutants such as Total Reduced Sulfur (TRS), Poly-Aromatic Hydrocarbons (PAH), chlorobenzene, HCl (Hydrochloric acid), Aliphatics Compounds, dioxins and furans.

The applications are in the kraft pulp industry, aluminium industry, roofing and shingle industry and also in magnesium industry. These pollutants are characterized by their corrosivity, a high molecular bonding and very high oxidation temperature, above 1200°C for the dioxins and furans.

SUPPLIER PRESENTATION SESSIONS

(Continued.)

SESSION 2:

Wednesday, March 5, 2003

11:45 AM

HAUCK HIGH TEMPERATURE BURNERS AND JASPER ECOREG ROTARY REGENERATOR SYSTEMS

John Marino, PE -

Senior VP of Business Development,
Hauck Manufacturing Co, PO Box 90,
Lebanon PA 17042

Hauck Manufacturing has been appointed the North American distributor of the Jasper GmbH EcoReg Rotary Regenerator systems. The EcoReg, the most successful rotary regenerator ever put into operation, currently boasts dozens of units in operation all over Europe with outstanding performance. Hauck has manufactured our first unit, and placed it in operation in our main test facilities in Lebanon, PA. Hauck has also developed a line of high temperature ultra-low NOx burners called the TriOx™ to operate with this system. The TriOx™ design is a family of burners specifically designed to operate in Aluminum melting furnace applications to supplement our highly successful High Momentum burners first introduced for aluminum melting over 20 years ago. This combination will usher in many new alternatives for the design and operation of aluminum melt furnace technology.

Make plans to attend these featured presentations conducted by the TMS 2003 Exhibitors.

Presentations will feature in-depth information on new technologies, equipment and processes shown on the show floor.

Location: Presentation Areas Inside Hall B1

Times: Tuesday and Wednesday ■ 11:45 AM to 1:45 PM

12:15 PM

ADVANCED N/O/H DETERMINATION WITH THE TCH600

Robert T. Pristera,
Leco Corp,
8200 S Quebec St Ste A3,
Englewood, CO 80112

LECO combines innovative technology with proven performance in our state-of-the-art TCH600 Nitrogen/Oxygen/Hydrogen Determinator. Providing advanced N/O/H determination in a single analysis for a wide variety of metal and inorganic applications, it is ideal for production and research environments.

The TCH600 features re-engineered solid-state infrared and thermal conductivity detectors that provide lower detection limits and expanded instrument range. Dynamic flow compensation ensures flow system integrity while improving accuracy and precision for nitrogen determination in high-level oxygen materials. A powerful electrode impulse furnace (controlled by power, current, or temperature) can be ramped for separation of oxides/nitrides.

The TCH600 allows for an optional batch-style sample loading carousel and autocleaner to enhance instrument performance and productivity. Easy-to-use Windows®-based operating software offers advanced diagnostics, extended archiving, and flexible reporting capabilities.

LECO's SmartLine® service modem link remotely connects the TCH600 to our service engineers. Other advantages include a smaller footprint, reduced maintenance, flexible upgrades, and pre-defined application techniques.

12:45 PM

BONE ASH

Ed Murray,
Murlin Chemical Inc,
10 Balligo Road,
West Conshohocken, PA 19428

This presentation will portray the use of bone ash in the nonferrous metals industries. Differences between Synthetic and Natural bone ash products will be described. Application methods and benefits will be discussed along with some of the physical and chemical properties of bone ash.

1:15 PM

MANUFACTURING EXECUTION SYSTEM (M.E.S.) IN AN ALUMINUM ROLLING PLANT (CORUS L.P.): A CASE STUDY

Jean Bonhomme,
Keops Technologies Inc.,
1155 University Street, Suite 1100,
Montreal (Quebec) H3B 3A7, Canada

This article outlines the development and implementation of a M.E.S. Solution by Keops Technologies in partnership with the Corus Canadian rolling plant.

Every step, issues, drawbacks, challenges as well as the benefits in putting into operation such systems are explained in detail in the article.

ATTENTION ALL NON-MEMBER REGISTRANTS!

All attendees and authors of the 132nd TMS Annual Meeting & Exhibition who register at the non-member or non-member author fee will automatically receive a one-year, complimentary associate membership for 2003!

Associate members receive all of the same benefits as members, including a free print and electronic subscription to *JOM*, discounts on TMS publications available via the TMS

Document Center, reduced registration fees for all TMS-sponsored meetings, inclusion in and access to the TMS Membership Directory and TMS OnLine, plus an array of other personalized membership benefits and services.

Your membership card and new member packet, along with a postal card asking for additional information for our records will be sent to you immediately after the meeting. Your associate membership will be activated upon completion of your registration form and payment of the non-member or non-member author registration fee. If you have any questions, please contact TMS Member Services at (724) 776-9000 ext. 241.

Test your golfing skills and help the



**Stop by the TMS Membership Area,
donate \$5 and get 3 chances to sink the ball.
Make a hole-in-one and you will be entered in the
drawing for a chance to win the grand prize.**

**TMS wishes to acknowledge the generous support
of the following organizations as Corporate Sponsors
of the TMS 2003 Annual Meeting & Exhibition.**

ALMEX USA Inc.	Wednesday Snack
Drache Umwelttechnik GmbH & Co KG	Coffee Breaks
Harbison-Walker Refractories Co	Signage & Tour/Housing Booth
Metaullics Systems.....	Cyber Cafe
Permatech	Badge Lanyards
Stein Atkinson Stordy Ltd	Registrant Bags



ACCOMPANYING TOURS

The Meeting Manager has been designated the official tour company for the 2003 TMS Annual Meeting & Exhibition.

The following tours are scheduled for your enjoyment.

Pre-purchased tickets may be picked-up at the Sight-seeing Tour Booth in the San Diego Convention Center, Ground Level Lobby.

Tours will depart from the San Diego Convention Center outside of Hall A.

City Tour

Monday, March 3, 2003

9:00 AM–1:00 PM

\$31.00 per person

San Diego is known as 'America's finest City', and this customized tour will highlight the many reasons why. This tour is a great way to introduce guests to San Diego.

This tour will educate guests on the history of San Diego and charm guests with its beauty. Areas featured include Coronado Island, home of the Hotel Del Coronado; the Embarcadero (Spanish for "the landing") where guests will see Navy Ships side-by-side; the Old World charm of the Gaslamp District; the rich history of Old Town, where San Diego was first founded in the 1700's; and the beauty and cultural wealth of Balboa Park.

If shopping is on the agenda, guests will stop at one of the areas' shops and boutiques. Pending tour logistics, we will select from downtown's architecturally unique Horton Plaza, the waterfront's Seaport Village, or elegant La Jolla.

San Diego Zoo Tour

Tuesday, March 4, 2003

9:00 AM–1:00 PM

\$65.00 per person

The World Famous San Diego Zoo is home to more than 1,600 animals and 6,500 plant species, each ready to welcome guest when they pass through the entrance gates.

A day at the zoo offers a myriad of possibilities for getting to know the animals. Guests may choose to get an overview on board a 35-minute narrated bus safari, which encompasses 80% of the Zoo's sprawling canyons and mesas. This is a fabulous way to meet a variety of animals, ranging from the tallest giraffes to the smallest meerkat. Guest may also proceed on foot and catch a ride back on the Ski-fari Tram that offers great views of the Zoo and Balboa Park.

What sets the San Diego Zoo apart is that it is also a certified botanical garden. Featured attractions include the elusive and cuddly Pandas; Tiger River; The Polar Bear Plunge; Gorilla Tropics; and Ituri Forest. The zoo has something for everyone. Come and talk with the animals!

Whale Watching Tour

Wednesday, March 5, 2003

8:45 AM–1:30 PM

\$61.00 per person

Whales are truly one of the most special creatures on our planet; the opportunity to view them closely is unique and becoming more rare with each passing year. San Diego is lucky to play host to these majestic mammals every winter. Guest will experience the excitement on a whale watching expedition just offshore in the blue waters of the Pacific Ocean.

Each year the graceful gray whales leave their home in the Bering Straits of Alaska and head for the warm waters off Baja California, Mexico. More than 15,000 whales make the journey and as many as 200 a day have been counted during peak season. During the cruise, the ship's captain will discuss the whales' migration habits and biological characteristics, allowing a better understanding of these beautiful creatures.

This is truly an unforgettable adventure that will create memories for years to come!

Winery Tour

Wednesday, March 5, 2003

9:00 AM–3:00 PM

\$82.00 per person

Box Lunch is Included

Temecule Valley is Southern California's celebrated Wine Country. Vistas of rolling hills are covered with uniquely designed wineries and vineyards. The blend of cool summer nights and a gap in the coastal mountain range allow the breezes from the Pacific Ocean to flow into the valley, creating a climate similar to the wine regions of Southern France.

The excursion will include a tour at one winery and tasting at two wineries. Wineries selected may include: Callaway Vineyard and Winery, the region's largest and most modern premium wine producer; Thornton Winery, whose champagne was chosen as one of the 1988 Presidential Inaugural champagnes; Mt. Palomar Winery, which produces a cream sherry in the old Spanish tradition; Cilurzo Winery, grower of Petite Sirah grapes; and Maurice Carrie Winery, producer of 14 different varieties. Guests will enjoy samplings of California's award-winning wines at these boutique wineries, each featuring their unique specialties.

TECHNICAL COMMITTEES AND CHAIRS

We salute the outstanding quality of the technical program presented at this year's Annual Meeting due to TMS's Technical Committees. We thank the program organizers, session chairs, and authors listed in the index.

The scheduling of the technical program for this meeting was the responsibility of the TMS Program Committee.

TMS Program Committee

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Idaho National Engineering Lab

PAST CHAIRPERSON

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Los Alamos National Lab

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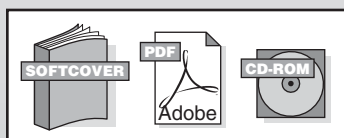
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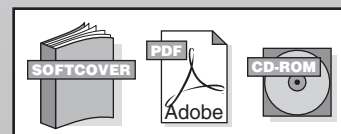
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