

# TMMIS

FUELING GROWTH AND FOSTERING INNOVATION

**2011** ANNUAL REPORT



## A Letter from the TMS Leadership

Dear Colleagues:

As we all look back on 2011, we may see it as a landmark year in many respects for our profession. We celebrated the winners of the Nobel Prize for Chemistry and the Kyoto Prize, who both hailed from the materials field. We saw the launch in the United States of the Materials Genome Initiative, which has energized the community. We have seen prominent materials scientists and engineers leverage their important roles in leading industry, government, and academic institutions for the greater good.

Likewise, 2011 was a significant year for TMS. Within these pages you will read the details of innovative initiatives in publications, meetings, and projects spanning traditional areas of strength as well as building on newer ones such as energy and Integrated Computational Materials Engineering (ICME). You'll also see how TMS continues to innovate to serve its members, from efforts to make volunteering with TMS the best and most valuable experience possible to continuing to add value to a TMS membership. In addition, this was the year in which the groundwork was laid to strengthen our efforts both to build the next generation of professionals and to address societal needs through our current programs and expansion of the TMS Foundation.

2011 was a successful year financially for TMS, with the results from growth in the areas of meetings, publications, and contracts contributing to a strong performance. TMS is a not-for-profit association, and so these resources will be reinvested in the development of new member services as well as in supporting the staff and other infrastructure needed to serve our members' interests in our growing field.

We could not conclude an annual report letter without thanking you, our members, partners, and customers, for supporting the mission and activities of TMS. We will continue to work to deserve your trust and engagement as we move confidently toward the future.

Sincerely,

A handwritten signature in cursive script that reads "Garry W. Warren".

Garry W. Warren

A handwritten signature in cursive script that reads "Warren H. Hunt, Jr.".

Warren Hunt



# 2011 TMS BOARD OF DIRECTORS

## OFFICERS

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# FUELING PERSONAL and PROFESSIONAL MEMBER GROWTH

TMS recognizes that materials scientists and engineers at all stages of their careers need ample opportunity to expand their knowledge, gain new experiences, and share their talents with the wider world. In 2011, noteworthy professional and personal development opportunities from TMS included:

## TMS Foundation Continues to Serve the Minerals, Metals, and Materials Community

The TMS Foundation is a philanthropic activity of the society, which provides funding for scholarships, awards for professional recognition, support of young professionals, and other unique growth and development opportunities for the community, especially in the area of how materials can positively impact the quality of life in society through materials innovation and solutions. In 2011, the TMS Foundation received roughly \$15,000 in restricted and unrestricted donations and disbursed more than \$70,000 in awards related to its mission. The TMS Foundation also began consideration of a major capital campaign in 2012.

## TMS Supports Students and Young Professionals



Creating opportunities for students and young professionals to grow is one of the goals of the TMS Foundation. In 2011, TMS facilitated these goals through:

- *Creating opportunities at the TMS 2011 Annual Meeting & Exhibition.* A record number of student members (nearly 1,000) attended TMS 2011 in San Diego, California, to present their work, network with professionals, and compete in events like the Materials Bowl and the Student Poster Contest.
- *Introducing the Henry Dewitt Smith scholarship.* Funded by the American Institute of Mining, Metallurgical and Petroleum Engineers (AIME), the scholarship offers two \$2,500 awards annually to graduate students.
- *Continuing support of the Young Leaders.* This program helps early career professionals to network, learn about the society, travel, and develop leadership skills.

## James Douglas Gold Medal Added to Honors & Awards Program

TMS added the James Douglas Gold Medal to its Honors and Awards Program. Funded by AIME, this award covers work in both the beneficiation of ores and the alloying and utilization of nonferrous metals.

## TMS Grows Its Washington Presence



In 2011, TMS expanded its presence in Washington, D.C. to provide members with a voice in national policy issues. As a U.S.-based organization, TMS works to improve the profession and the field as a whole, through initiatives such as:

- “Accelerating Materials and Manufacturing Innovation for Global Competitiveness,” an informational luncheon held in Washington D.C. in August, educated approximately 60 congressional, academic, federal-agency, and industrial representatives on how to produce advances in materials and manufacturing development. TMS co-sponsored the event with the Materials Research Society.
- TMS helped to organize a special session on the Materials Genome Initiative (MGI) at MS&T’11 in Columbus, Ohio, to inform the materials community about this critical, enabling element of the U.S. Advanced Manufacturing Partnership.
- TMS engaged *LobbyIt*, a Washington, D.C. firm, to help elevate the society’s presence and voice in Washington, D.C. The firm will help TMS to develop effective short- and long-term federal relations strategies.

## 2011 Membership Snapshot

In 2011, TMS increased the number of dues-paying professional members by **11.3%** over 2010, thanks to member-growth initiatives instituted the previous year. This marks the second consecutive year of significant growth in professional membership for TMS.

# FOSTERING INNOVATION IN CORE TECHNOLOGIES and GROWTH AREAS

TMS is proud to provide a home for many of the traditional technologies associated with materials science and engineering, providing opportunities to share new research and technical developments, to network, and to help these technologies constantly move forward. At the same time, the society strives to create space and opportunity for new branches of MSE to flourish. Here is a look at how TMS fostered creativity and innovation in both traditional and emerging materials fields in 2011:

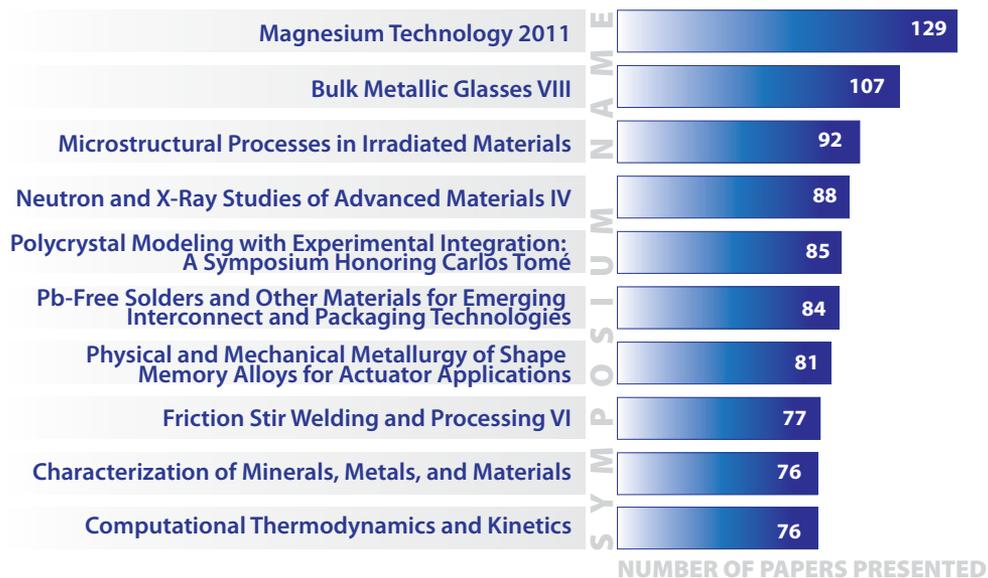
## TMS 2011 Annual Meeting & Exhibition Sets Record for Most Papers Presented

Record numbers of materials professionals and students from all disciplines gathered in San Diego, California, for the TMS 2011 Annual Meeting & Exhibition. The number of papers presented at the conference—more than 3,800—was the largest in the society's history. TMS extended the conference to include a full day of technical programming on Thursday to accommodate the additional presentations. With nearly 4,200 attendees,

the conference was the second-best attended in the past decade and the fifth best-attended in the conference's 140-year history.

## Top 10 Largest Symposia from TMS 2011

For some perspective on the core technology areas where TMS members are most active, look at the largest symposia—in terms of number of papers presented—from the TMS 2011 Annual Meeting.



## TMS Enhances the Volunteer Experience

Recognizing the benefits of volunteering to both members and the society, TMS created the Enhanced Volunteerism Program to help members learn how to take advantage of the many volunteer opportunities available to those working in all areas of MSE. In 2011, TMS volunteers could, for example, develop conference programming for a well-established technical committee, provide input on the future of U.S. energy policy, or conduct evaluations of college and university academic programs. The Ad Hoc Committee on Enhanced Volunteerism, made up of several TMS volunteer members, created a roadmap that outlines how TMS can strengthen its position as a volunteer-centric professional society.

TMS created a physical presence for the volunteer initiative through information booths and displays at the TMS 2011 Annual Meeting and at MS&T'11. Through these outlets, members could learn about existing opportunities and resources for TMS volunteers. In 2012, this information will be readily available to all TMS members through the new Volunteer Central website, [volunteer.tms.org](http://volunteer.tms.org).



# FOSTERING INNOVATION IN CORE TECHNOLOGIES and GROWTH AREAS

## TMS 2011 Hosts International Forum for Magnesium Community



Established in 2000, the Magnesium Technology Symposium is a good example of how a technology can grow through the actions of dedicated TMS volunteers. A decade after its inception, the symposium consistently tops the list of popular Annual Meeting events and provides a centralized meeting place for magnesium specialists throughout the world.

## TMS 2011 Celebrates 125 Years of Aluminum Electrolysis



The TMS 2011 Annual Meeting included a celebration of the 125th Anniversary of the Hall-Héroult Process. The 2011 Aluminum Plenary Symposium celebrated the discovery of the electrolysis process that made the mass production of aluminum possible with presentations by some of the world's leading aluminum experts. The seven presentations delivered at the conference are now available on the TMS website.

## TMS Concludes Two-Year Energy Materials Study



Since February 2010, TMS has coordinated an energy materials study on behalf of the U.S. Department of Energy Advanced Manufacturing Office (previously the Industrial Technologies Program). The goal of the study is to pinpoint where materials innovations can transform developing energy technologies into clean, affordable, and widespread options that will support new manufacturing opportunities.

Through the work of more than 100 volunteers, TMS published the *Innovation Impact Report* phase of this study in December 2011. The report identifies 54 specific opportunities that could save more than 2,800 trillion Btu, avoid 435 million tons of CO<sub>2</sub> emissions, and eliminate \$65 billion in unproductive energy expenditures by U.S. businesses every year. These recommendations were developed by volunteer Innovation Impact Teams convened by TMS for five specific technical focus areas: Functional Surface Technology, Materials Integration in Clean Energy Systems, Higher Performance Materials, New Paradigm Materials Manufacturing Processes, and Materials and Process Development Acceleration Tools. The work of the Innovation Impact Teams was developed within the framework of the broad technical themes articulated in the *2010 Vision Report*, published by the Energy Materials Blue Ribbon Panel in the first phase of the project. Four Technical Working Groups convened by TMS in the second phase of the project then used the principles laid out by the Blue Ribbon Panel to guide their identification of the most promising research and development opportunity areas. These recommendations were published in January 2011 in the *Opportunity Analysis for Materials Science and Engineering*, and served as the basis for the in-depth review of specific technologies carried out by the Innovation Impact Teams.

To access all of the reports generated by this project, as well as information on energy-related volunteer opportunities, visit the TMS Energy website at [energy.tms.org](http://energy.tms.org).

# FOSTERING INNOVATION IN CORE TECHNOLOGIES and GROWTH AREAS

## Special Events Take a Closer Look at Technologies

In addition to the TMS Annual Meeting, which offers a broad spectrum of technical programming within MSE, the society provides opportunities for more focused learning through specialty conferences and courses in specific technology areas. In 2011, these events included:



**The 15th International Conference on Environmental Degradation of Materials in Nuclear Power Systems – Water Reactors.** Colorado Springs, Colorado. This conference examined nuclear materials and corrosion issues.



**TMS Industrial Aluminum Electrolysis Course 2011.** Reykjavik, Iceland. This 4.5-day course, held annually in different locations, included an on-site visit to the NORDURAL aluminum smelter.



**COM 2011: The Conference of Metallurgists.** Montreal, Canada. TMS co-sponsored this meeting, which was sponsored by the Metallurgy and Materials Society (MetSoc) of the Canadian Institute of Mining, Metallurgy, and Petroleum. TMS and MetSoc are both members of the Alliance of the Americas, through which TMS partners with societies in neighboring countries on extraction and processing issues.

## Two New Conferences Planned on Hot-Topic Technologies for 2012

In 2011, plans were made and abstracts submitted for two brand new conferences on important MSE-related technologies. The following conferences are planned for 2012:



**Carbon Management Technology Conference.** Scheduled for February 7-9, 2012 in Orlando, Florida, this inaugural conference considers the reduction of greenhouse gas emissions and adaptation to changing climate from an engineering perspective.



**International Conference on 3D Materials Science 2012.** Scheduled for July 8-12 at the Seven Springs Mountain Resort in Pennsylvania, this conference aims to provide the premier forum for presentations on the three-dimensional characterization, visualization, quantitative analysis, modeling, and investigation of structure-property relationships of materials.

For a look at additional specialty conferences planned for 2012, including Superalloys 2012 and the 13th International Conference on Aluminum Alloys, see the Upcoming TMS Meetings section of the TMS website ([www.tms.org](http://www.tms.org)).



## TMS Members Help Grow MS&T Attendance

As a founding partner, TMS has been integral to the success of the Materials Science & Technology (MS&T) conference series. In 2011, meeting attendance reached an all-time high of 3,451 attendees, up from 3,000 in 2010. More than 50% of MS&T'11 attendees were TMS members.



# FOSTERING INNOVATION IN CORE TECHNOLOGIES and GROWTH AREAS

## Metallurgical and Materials Transactions Expands Energy Coverage



In 2011, the archival journal *Metallurgical and Materials Transactions* expanded coverage of energy materials and began publishing special supplemental issues devoted to Materials for Energy Applications. Articles from the special April issue were made available to all web users as Open Access articles through Springer.



## TMS Holds First World Congress on ICME

In 2010, TMS established a new technical committee devoted to the emerging area of Integrated Computational Materials Engineering (ICME). Just one year later, TMS held the First World Congress on ICME, a meeting that gathered more than 230 attendees at the Seven Springs Mountain Resort in Pennsylvania. The conference was designed to encourage rich discussions, networking, and learning from recognized pioneers in the field. One of the Congress's strengths was in the diversity of its participants, providing a look at ICME around the globe.

TMS is also helping to nurture the development of ICME through other society activities. ICME was the focus of the 12th Materials Processing & Manufacturing Division Global Innovations Symposium at the TMS 2011 Annual Meeting, and the ICME Committee acted as a sponsor of July's ICME Summer School at the University of Michigan.

# INNOVATIONS IN PUBLISHING and OPPORTUNITY DEVELOPMENT

As publishing evolves to integrate new technologies, many of the traditional avenues for disseminating research and technical developments have changed. In 2011, TMS evaluated some of its long-held practices to find the best ways to create publishing opportunities and deliver more high-quality technical content to its members.

## TMS Renews Publishing Contract with Springer



In 2011, TMS renewed its agreements with Springer Science + Business Media to publish *Metallurgical and Materials Transactions A*, *Metallurgical and Materials Transactions B*, *Journal of Electronic Materials*, and *JOM*. The new agreements increase the number of pages published per year for each journal. *JOM*, the member journal of TMS, will increase its editorial pages by 25% under the new agreement, significantly enhancing publishing opportunities for authors and allowing for expansion of technical topics.

## TMS Introduces Open Innovation Program



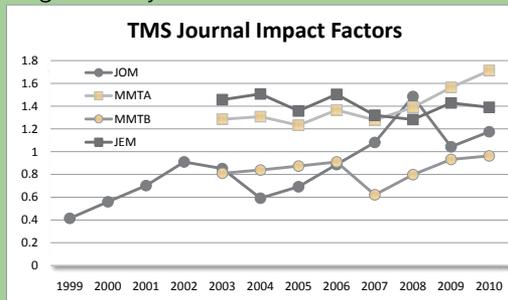
TMS teamed with the Propane Education and Research Council (PERC) for its first Open Innovation project in 2011. The Propane Challenge sought proposals for a materials solution enabling the development of lighter, more cost-effective propane storage vessels that overcome traditional barriers. The concept of “open innovation” supports advancement of technology by crossing traditional organizational boundaries to share ideas, knowledge, research, and inventions. TMS is implementing this approach to create new products, services, and resources for its members and other customers, and to address critical materials science and engineering issues and opportunities.

## New Content Committee Reflects Changes in Publishing

In 2011, TMS consolidated the activities of three of its long-standing administrative committees—Content Capture and Delivery, Information Technology, and Publications Coordinating—into the Content Development and Dissemination Committee. The new committee, which will guide TMS initiatives and programs related to the development of content and its delivery via any form of media, ensures that information technology and publishing initiatives work together as efficiently as possible.

## TMS Journal Impact Factors on the Rise

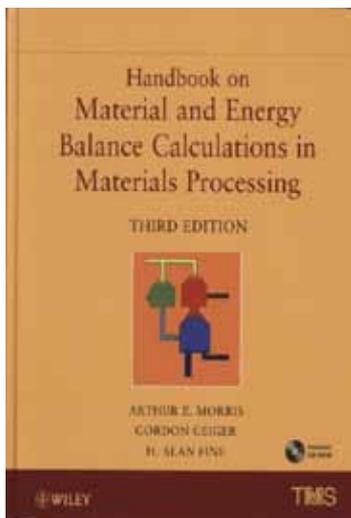
An important indicator of a journal's influence in the larger science and engineering community is its Impact Factor—a measure of how frequently a journal's papers are cited. In recent years, the impact factors for most TMS journals have increased significantly.



# INNOVATIONS IN PUBLISHING and OPPORTUNITY DEVELOPMENT

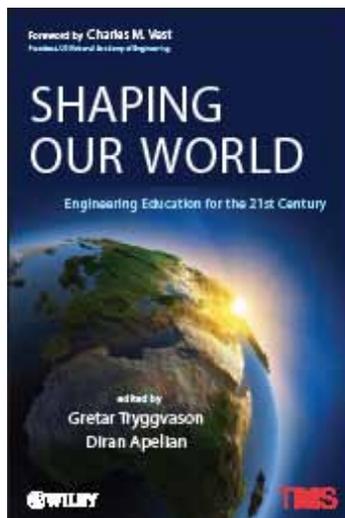
## TMS and Wiley Release New Titles

TMS has partnered with John Wiley & Sons to publish textbooks and edited compilations for materials scientists and engineers. In 2011, the first two books were released:



### Handbook on Material and Energy Balance Calculations in Materials Processing, Third Edition

by Arthur E. Morris, Gordon Geiger, and H. Alan Fine



### Shaping Our World: Engineering Education for the 21st Century

edited by Gretar Tryggvason and Diran Apelian

TMS members receive a 25% discount on these and all TMS publications in the Wiley catalogue.



## TMS Launches New Open-Access Journal: *IMMI*

TMS and Springer have announced a new Open Access journal, *Integrating Materials and Manufacturing Innovation (IMMI)*. Combining the peer review rigor of scholarly publications with enhanced digital content, *IMMI* will cover innovations from materials discovery through manufacturing. The Open Access format will allow authors to share their work freely with readers in industry, academia, and government. Charles Ward of the U.S. Air Force Research Laboratory will serve as the journal's first editor.

*IMMI* will be the flagship publication of the new Materials Innovation @ TMS initiative, which focuses on accelerating materials discovery and commercialization through the effective integration of computational and experimental tools that serve to unify and streamline design and manufacturing processes. For more on this initiative, visit the new [materialsinnovation.tms.org](http://materialsinnovation.tms.org), a gateway to the tools, data, talent, and resources needed to effectively implement the principles and techniques that are critical to *IMMI*.

## INNOVATION FUELED BY FINANCIAL RESOURCES

The table below presents the preliminary and unaudited financial results from TMS operations in 2011. It tabulates the revenues and expenses of all of the operational activities of the Society, organized by major category. In summary, revenues totaled approximately \$6.6 million, representing a 15% increase over 2010. TMS realized excess revenue after subtracting expenses of \$680,000. This resulted in a return on revenue of 10.2%, which compares to an average of 4.2% over the previous decade.

Preliminary & Unaudited

### STATEMENT OF ACTIVITIES

December 31, 2011

|                           | Revenue            | Expenses           | Excess Revenue   |
|---------------------------|--------------------|--------------------|------------------|
| Member Services           | \$517,468          | \$339,008          |                  |
| Publications              | \$2,159,998        | \$799,414          |                  |
| Meetings and Events Mgmt. | \$3,326,010        | \$2,046,994        |                  |
| Contracts                 | \$366,033          | \$295,861          |                  |
| Volunteer Support         | \$117,509          | \$568,775          |                  |
| Operations                | \$153,853          | \$1,911,674        |                  |
| <b>TOTAL</b>              | <b>\$6,640,871</b> | <b>\$5,961,726</b> | <b>\$679,145</b> |

Clearly 2011 was a favorable year from a financial perspective, primarily due to strong response to TMS events, publications, and other services. The growth seen in both the Annual Meeting and specialty conferences is a testament to the quality of member-developed programming. Increased revenues from subscription growth in both archival journals as well as member journal *JOM* likewise attest to the quality of these products, which is the result of member contributions and support as both authors and editors. Continuing success in winning contracts and grants to support government objectives points to the strength of our ability to convene the community, gather relevant information, and effectively document and disseminate it. In addition, growth was seen in membership and this further supports the value proposition of TMS, which is built on the strength of our members.

So how does TMS continue to sustain its mission as well as provide the resources to continue growth and innovation in support of member-defined

objectives? One way is through prudent financial management. With the oversight and guidance of the volunteer Financial Planning Committee, chaired by the Financial Planning Officer, staff emphasizes conservative budget planning and expense control to deliver member products and services efficiently and effectively. A second way is through reinvesting excess revenues into new products and services. This is carried out through the TMS Reserve Fund, which not only provides financial security for TMS but also provides the resources for a Development Budget. The Development Budget has been used most recently to increase the technical capability of TMS staff, enhance the support for TMS volunteers, and support new growth initiatives. Looking ahead, it will continue to support operational innovation and new efforts to best serve TMS members and the materials community.

## **ABOUT TMS**

The Minerals, Metals, & Materials Society (TMS) is an international professional organization that encompasses the entire range of materials science and engineering, from minerals processing and primary metal production to basic research and the advanced applications of materials. TMS members number over 11,000, live in more than 70 countries on six continents, and include engineers, scientists, researchers, educators, administrators, and students.

For regular updates on society activities,  
visit the TMS website at [www.tms.org](http://www.tms.org).

# **TMS**

The Minerals, Metals and Materials Society