



Left to right: India Member Chapter secretary N.K. Guha,
2009–2010 AIST president Anthony R. Bridge, and
2009 AIME Honorary Member Robert G. H. Lee.

AISTech 2010 Conference & Exposition Review

process or product technologies. Attendees had the opportunity to see hundreds of informative exhibits and presentations. By the end of the four-day event, those who attended AISTech met many interesting people and took part in numerous discussions, expanding their steel network.

AISTech 2010, the steel industry's premier technology event of the year, took place May 3–6 at the David L. Lawrence Convention Center in Pittsburgh, Pa. A total of more than 6,595 AIST members and conference attendees came together with key steel producers, suppliers, corporate executives and academia to exchange technical information, connect with others in the industry, and see new



Golf Outing

The annual AIST Foundation Golf Classic kicked off AISTech on Sunday, May 2 at two courses: Chartiers Country Club and Olde Stonewall Golf Club. A total of eight corporate sponsors and 201 golfers supported the event, raising approximately \$60,000 for AIST Foundation programs. Special thanks to the AIST Foundation Golf Committee chair, Tom Russo, president of TRUSSCON Inc. See page 30 for a list of the event's winners and sponsors.

Plan now to participate in the 2011 AIST Foundation Golf Classic in Indianapolis, Ind. For more information on sponsorships and registration, contact Lori Wharrey at (724) 814-3044 or lwharrey@aist.org.



Exhibit Hall

With a backdrop of the Steel City of Pittsburgh, AISTech welcomed 431 exhibiting companies. Special thanks to exhibitor committee chair **Kristy McMullin**, formerly of Heraeus Electro-Nite Co., for her hard work in making the exhibit floor a place where conference attendees could learn about the latest technologies in the steel industry. Attendees enjoyed the show floor and meeting International Robotics Inc.'s "Sico Millennia," a sophisticated mobile robot who posed for photographs and engaged in spontaneous conversations with attendees.

"AISTech is consistently one of those rare gatherings where everyone attending is treated as a valued participant," said Patrick J Metzen of Metzen Equipment. "There are very few events where you can network as easily with industry managers, CEOs, R&D personnel and others so easily. This is one of the few events where I benefit consistently with numerous business opportunities, and I am recommending AISTech to the principal companies I represent."

The increased attendance and convenient layout of the exhibit hall provided a great opportunity to meet with vendors and potential customers in a centralized location.



Technical Sessions

The conference program for AISTech 2010, developed by AIST Technology Committee members from iron and steel producers, suppliers and academia, focused on all aspects of ironmaking, steelmaking, finishing processes and equipment technologies. A total of 390 technical presentations took place within 79 technical sessions. Conference registration totaled 1,562, with attendees representing 40 countries from around the globe.

AIME Keynote and J. Keith Brimacombe Memorial Lecture

The AIME Keynote and J. Keith Brimacombe Memorial Lecturer was **Chenn Q. Zhou**, professor and department head of mechanical engineering, as well as the director of the Center for Innovation through Visualization and Simulation (CVIS) at Purdue University Calumet (PUC). Her lecture, "Visualizing the Future in Steel Manufacturing," was presented to more than 500 attendees on Monday, May 3.



AIST International Alliance Lecture

Following the Brimacombe Memorial Lecture, the AIST International Alliance featured **Horacio Leal Barbosa Filho**, executive director of Associação Brasileira de Metalurgia, Materiais e Mineração (ABM). Mr. Leal presented his lecture, "The Steel Industry of Brazil — Growth and Transition."

President's Award Breakfast

Anthony R. Bridge, 2009–2010 AIST president, hosted the President's Award Breakfast on Tuesday, May 4 to a sell-out crowd of 1,200. The breakfast program consisted of the presentations of several prestigious association awards and AIME awards, followed by a keynote presentation by **John P. Surma**, chairman and chief executive officer of United

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States Steel Corporation. Surma was honored as recipient of the William T. Hogan Lecture Award and presented his address, "Steel Trends in 2010."

Surma discussed the future of the industry and the direction in which it is heading after a dismal 18 months. With positive signs of an economic recovery, he stressed that the United States has a wealth of natural resources to allow the steel industry to return to normal levels without the expense of importing materials for production.

"Last year at this time, we all thought the world was going to end," Surma said. "It didn't. The dark times will come; they always do, but so do the brighter times."

Making note that it will be years before we see a return to normal, he said, "We've already gone through a good bit of restructuring earlier in the decade, so we are better prepared and better managed to come out of the abyss quicker than in other downturns."

The full keynote address by Mr. Surma was published in the July 2010 issue of *Iron & Steel Technology*.

Other awards included:

- The AIST Steelmaker of the Year to **Ratan N. Tata**, chairman, Tata Industries.
- AIST Distinguished Member and Fellow Award to **Raymond S. Milman**, senior staff engineer, Middough Inc.
- The Tadeusz Sendzimir Memorial Medal to **Gerald R. Heffernan**, president, G.R. Hefferman & Associates.
- The John F. Elliott Lectureship to **David G.C. Robertson**, professor emeritus of metallurgical engineering, Missouri University of Science & Technology.
- The AIST Benjamin F. Fairless Award to **Anthony J. DeArdo**, professor, University of Pittsburgh.
- The first-place AIST Hunt-Kelly Outstanding Paper Award to **Raimundo A.F.O. Fortes**, metallurgist, Gerdau Acos Longos Brasil S.A.; **Hiroyuki Matsuura**, assistant professor, The University of Tokyo; and **Richard J. Fruehan**, professor, Carnegie Mellon University.
- The 2009 AIME Honorary Member: **Robert G.H. Lee**, retired from Air Liquide.

The full slate of recipients of the 2010 AIST Association-Level Awards and Technology Division-Level Awards was included in the July issue of *Iron & Steel Technology*.

Member Chapter Meetings at AISTech

AIST Members and staff met with representatives from the AIST Brazil Member Chapter, Associação Brasileira de Metalurgia, Materiais e Mineração (ABM) and several Brazilian companies to discuss the respective missions of service of AIST and ABM to the steel industry, and to explore areas of collaboration.

To further the goal of establishing a new AIST Member Chapter in Italy in 2010, the Italy Planning Committee met at AISTech 2010. The next meeting will be held in the fall of 2010.

Representatives from the AIST India Member Chapter met with AIST staff members to discuss opportunities for growth within India. The India Member Chapter was established in 2008 and had both the largest percentage of membership growth (44.1%) and largest numerical increase (30) in chapter membership for 2009.



Pictured on this page:

Third photograph (right): AIST India Chapter meeting: Debasish Guha, Dasnagar Precision Engineering Ltd.; Mark Didiano; Joann Cantrell; Ronald Ashburn; Nirmal Kanti Guha, advisor to chairman, Ramsarup Group, and AIST Life Member and India Chapter secretary; Nicole Mattern; Stacy Varnecky; Mike Strelbisky, president, Tallman Bronze Co.; and Bimalendu Mukhopadhyay, Consulting Engineering Services Pvt.

Fourth photograph (right): John P. Surma, chairman and chief executive officer of United States Steel Corporation, presents his keynote address at the AIST President's Award Breakfast.

Town Hall Forum

On Wednesday, May 5, more than 750 attendees gathered at the David L. Lawrence Convention Center in Pittsburgh for the Town Hall Forum to hear seven leading steel industry executives participate in a panel discussion moderated by **Jon Delano**, money and politics editor for KDKA TV (CBS), Pittsburgh, and political analyst and adjunct professor of the H. John Heinz College at Carnegie Mellon University.

Panelists included **James D. Frias**, CFO, treasurer and executive vice president, Nucor; **Gretchen R. Haggerty**, executive vice president and CFO, United States Steel Corporation; **Andrew S. Harshaw**, executive vice president, operations, ArcelorMittal; **Dieter Hoeppli**, managing director, global head of steel and head of metals and mining in the Americas, UBS Securities LLC; **Mario Longhi**, CEO and president, Gerdau Ameristeel; **Gary M. Novak**, president, global linings division, Vesuvius; and **Richard P. Teets Jr.**, executive vice president for steelmaking, president and COO of steel operations, Steel Dynamics Inc.

The panel discussions opened on the topic of safety, with Gary Novak of Vesuvius giving the industry suppliers' point of view. "As leaders, we have a moral responsibility to keep our people safe and to make sure that we're protecting our people. We've tried to follow the steel industry's lead to administer as good of a program as we've seen in the field," he said. "We try to take the best of all that we've seen and incorporate it in our safety programs. As a supplier, we're judged on our safety performance as well. There's quality, price and service, but if we don't perform safely, we won't be there very long. On any given day, we could have up to 200 workers in a steel plant, so we have to be vigilant to protect our people and protect our business."

The executives discussed the return to profitability, saying that most steel producers were in better positions to endure the industry's most recent downturn, mainly due to the consolidations after 2001 which strengthened the companies existing today.

For Gerdau Ameristeel, what made the difference in managing the most recent downturn was preparing for sensitivity, explained Mario Longhi. "Preparing for difficulty, identifying several actions to put into place to respond quickly, and continuous monitoring and internal forecasting to hone in on metrics and give inside understanding of where everything was headed was crucial. For all of the past quarters in the downturn, we were one of a very small number of companies that delivered positive ebitda."

In 2008, Gretchen Haggerty of U. S. Steel watched closely as the economy turned and the situation with financial institutions such as Lehman Brothers unfolded. "The week of September 15th, the world dropped off a cliff. You could see a palpable change in our business and that of our customers. You had to conserve and raise liquidity, which is what U. S. Steel did. Liquidity is fundamental to any business," Haggerty said.

James D. Frias

Gretchen R. Haggerty

Andrew S. Harshaw

Dieter Hoeppli



After reducing capital expenditures in 2009, U. S. Steel recently modified spending for 2010 to \$560 million on significant strategic projects, including one of the batteries at Clairton Works. U. S. Steel expects the trend of increasing capital spending to go forward in 2011.

Panelists agreed that the years 2004–2008 made the entire steel industry much stronger than what it was in 2002–2003. The risks, because of the strength of the balance sheets, were different in 2009 than in 2003. “What helped Nucor was our incentive-based pay system,” said James Frias. “Two thirds of our employees’ pay is based on the production bonus, based on prime tons produced. We didn’t lay off a single person — their wages were flexed down because they weren’t producing as many tons, but they kept their benefits and we had the ability to respond when the market went up.” Frias noted that Nucor’s conservative balance sheet gave the company a higher credit rating while Nucor kept capital expenditures on schedule and finished projects like the Memphis SBQ mill and increasing direct-reduced iron capacity in Trinidad.

Andrew Harshaw of ArcelorMittal sees improved demand for the 2010 steel market in the automotive sector. “We’ve seen strengthening in plate, but commercial construction is lagging, and right now, the recovery is being led by automotive. We’re about 50% back, but it will be a slow, progressive recovery and will be 2014 until we see a return of the activity of 2008.”

The concept of steel companies going green being beneficial to the capital markets was endorsed by Dieter Hoepli of UBS Securities. Hoepli said, “Compliance with environmental laws is absolutely critical for companies, and going beyond what is required is being well received by the capital markets. Companies which are proactive will have an advantage over others.”

Harshaw stated that environmental stewardship is fundamental to the industry. “You can’t be in the steel business and not pay attention to the environment as a key stakeholder.”

When asked to amplify how important steel manufacturing is in the U.S. and what makes steel relevant in the 21st century, Mario Longhi expressed his opinion that steel is fundamental, beginning with its importance to national security, “to maintain and grow our steel capabilities.”

On the subject of steel technology, Dick Teets talked about the challenges at Steel Dynamics. “Each company has a vested interest in pushing the envelope for technology. Not everyone can do everything, as some companies are better structured



Mario Longhi



Gary M. Novak



Richard P. Teets Jr.



George J. Koenig





for certain ventures. There are always challenges, but companies must have the stamina to know that it is an investment and it may take a few years to pay off. There's tremendous opportunity."

During the second half of the Town Hall Forum, attendees had the opportunity to submit questions to panelists.

To summarize the Town Hall discussion on what steel companies have learned from their past, Gary Novak of Vesuvius said that business can be cyclical at times and this last recession was more dramatic than most. "We need to be cautious and watch from becoming too complacent, even as times become better. We have been forced to think about the critical aspects of business versus the nice-to-haves. If you're operating lean and looking at the right things to do, you need to continue to make that distinction as the economy improves."

Hoeppli said there is one simple answer: for companies to "raise capital when you can, rather than when you have to."

AIST is providing the opportunity to view The Town Hall Forum via Webcast. The Webcast, which features nearly 3 hours of the engaging dialogue by the steel industry executives, is sponsored by Berry Metal Co., IMS Systems Inc., Thermo Fisher and Woodings Industrial. The Webcast is free to AIST Members and is available on the Members Only area of AIST.org. Nonmembers may purchase and download the 2010 Town Hall Forum Webcast by contacting AIST Member Services at (724) 814-3000, ext. 1.

Students at AISTech

The AIST Foundation, with support from six industry companies, held student-specific programs at AISTech 2010. The corporate sponsors were ArcelorMittal, Ellwood Group Inc., Nucor Corp., SSAB, Steel Dynamics Inc. and TMK IPSCO.



Engineering students from all related disciplines were encouraged to attend AISTech 2010, being offered complimentary registration, travel grants and paid session monitor positions. A total of 76 students, both undergraduate and graduate, from 20 universities, both national and international, registered for the conference. In addition, AIST held an Attendance Challenge. The university with the highest number of students in attendance received \$500. The winner of this challenge was Purdue University Calumet.

Student activities began with a plant tour on Sunday, May 2, to TMK IPSCO Koppen Tubulars Co. in Ambridge, Pa. Tour attendees saw the process for manufacturing of carbon and alloyed seamless and welded pipe products.

Following the plant tour, the students attended an orientation, where they learned about AIST from **Bill Albaugh**, AIST Technology Programs manager, before hearing three different perspectives on industry experience, accomplishments and goals. The first was **Brendan Connolly** from Ellwood Quality Steel, new to the steel industry. Next, **Scott Mills** from TMK IPSCO gave his perspective as someone who has been in the industry for 10 years, advancing in responsibilities over the years. Last was **Dick Teets** from Steel Dynamics Inc., who presented his background and goals from the executive level. Those attending enjoyed dinner and networking with representatives from the corporate sponsors.

The AIST Student Project Presentation Contest was held on Monday, May 3. During this contest, 12 students presented 10 projects before a panel of judges. The judges were **Kelly Dallas** from ArcelorMittal, **Charles Fryman** from Ellwood Quality Steels, **Ron O'Malley** from Nucor Corp., **Jim Wharrey** from TMK IPSCO, and **Kevin Bort** from Steel Dynamics Inc., who also acted as contest chair.

Participants were judged on technical content, topic coverage and presentation skills. The contestants included: **Sam Buckholz**, **Andrew Luke**, **Jacob Johnson** and

Hanna Terwelp from Missouri University of Science & Technology; **Bruno Pinheiro** and **Raimundo Antero** from the Universidade Federal De Ouro Preto; **Gabriel Ger-son** from Carnegie Mellon University; **Bobby Gyesi** from The Ohio State University; **John Dalton** from Case Western Reserve University; and **Song Zhang, Alek Shmagranoff** and **Tom Roesel** from Purdue University Calumet.

The winners of the Student Project Presentation Contest and their presentations are as follows.

First Place (\$1,500) — **Jacob Johnson** and **Hannah Terwelp** from Missouri University of Science & Technology, for their presentation entitled, “Antimicrobial Applications of Copper Alloys,” where various copper alloys were investigated to determine the efficacy of different alloys and surface finishes. Corrosion and compounds formed on the surface after contact with industrial cleaners and human contact were analyzed to project long-term effects on the surface of the copper.

Second Place (\$1,000) — **Alek Shmagranoff** from Purdue University Calumet, for his presentation entitled, “3-D Simulation of a Chemical Leaching Tank for Improved Solids Suspension.” A process to remove impurities from iron ores by chemical leaching was modeled using computational fluid dynamics to study the level of suspension of the iron ore inside the tank. The results were then used to optimize the design of the agitation system and the leaching process.

Third Place (\$500) — **John Dalton** from Case Western Reserve University, for his presentation entitled, “Improved Methods for Copper-Steel Bonding of Electrical Connectors in Railway Applications.” Dalton discussed how demands for faster and more efficient means of transportation have driven the global railway industry to produce safe and reliable tracks. Copper electrical connectors play an important role in modern-day railway systems for grounding and communication purposes. Exothermic welding, or cad-welding, is currently the most popular bonding method to permanently fix copper to the steel to create an electric connection between discontinuous rails. Although the bond is strong, the high heat of the exothermic reaction causes a large heat-affected zone (HAZ) in the steel, which may reduce bond longevity and is a potential site for fatigue crack propagation. A series of bonding methods, including brazing, tinning, epoxies and plate geometry, were explored to meet the strength requirements of the bond while minimizing the HAZ. Fatigue testing was also performed on traditionally welded, plated, and regular steel to determine the HAZ effect on the bond’s life cycle. Microstructural analysis was then conducted to determine any differences in failure modes.

Following the contest, tickets were drawn for door prizes donated by SMS Siemag LLC, Ellwood Group Inc., Nucor Corp., SSAB and AIST. A special thanks is extended to the contest chair, Kevin Bort from Steel Dynamics Inc., along with all contest judges and companies who donated the door prizes.

Also on Monday, the students were invited to lunch with the AIST Foundation trustees. This was a great opportunity for both students and the trustees. The students had the chance to talk with executives from all different companies about the steel industry, and the trustees had the chance to ask the students questions and encourage them to consider the industry as a career.

Finally, the students took a tour of and ride on the Duquesne Incline. They learned about the engineering necessary to make the incline possible. After the tour and ride, they headed to the Hard Rock Café for dinner.

Students attending AISTech 2010 had the opportunity to receive and earn financial assistance to help defer travel expenses through AIST Foundation and Material Advantage travel grants, contest travel grants and prizes, and session monitor positions. They were able to learn about the newest technologies, meet and network with steel industry professionals, practice their presentation skills, and have fun.

“It was really great to see the world of steel thriving as such. Many people were present, and they seemed very intrigued by some of the new developments. Even with my rudimentary knowledge and experience of steel industry at large, I got the impression that the future looked promising.” — Christian Dalton, Case Western Reserve University



"I had a great experience at the 2010 AISTech conference. It was my first experience with AISTech, and I was amazed at its scale! Being a recent graduate and entering the steelmaking field, it is comforting and exciting to see all the new technological advances and research devoted to steelmaking. Even as a participant in the Student Presentation Contest, I was interested in and excited about the research being performed at the academic level. I look forward to future visits to AISTech!" — Gabriel Gerson, Carnegie Mellon University

"Being able to attend this event as a student was great because I got to talk to people in the industry to find out about the opportunities I can possibly have in the future. Also, through the events planned for the students, I got to meet students from other schools in similar programs to mine. It was a valuable networking event for me, and I had a great time." — Aleksandr Shmagranoff, Purdue University Calumet

"I love the student activities offered at the conference. The student speaking contest was a blast and allowed me to practice giving a technical presentation to a technical audience, which I hope to do more frequently in the future. Also, the camaraderie between the students and young professionals is awesome. I'm glad I chose to study metallurgical engineering!" — Hannah M. Terwelp, Missouri University of Science & Technology

"It was a wonderful trip in Pittsburgh, and we had a very successful conference. The paper was well presented, and the questions from the audience gave us more ideas regarding the complicated phenomena we are investigating. I attended two plant visits, and the experience of the American steel companies during the economic crises encouraged us in coping with different situations in hard times. Particularly, the slogan of 'steel yourself' gave me a very deep impression." — Bernard (Xiaodong Xu), Swinburne University of Technology, Australia

"I am very proud of being an international undergraduate student attending AISTech. It is a good chance for us to communicate with many experts from different areas. It is also a valuable opportunity for us to learn many real-world applications using the knowledge that we have learned from school." — Xin Shi, Purdue University Calumet

Plan Now for AISTech 2011

The AIST executive committee and board of directors extend a special thank-you to the AISTech 2010 Conference Planning Committee chair, **Scott Mills** of TMK IPSCO; Exhibitor Committee chair, **Kristy McMullin**; Town Hall Forum session chair, **George Koenig** of Berry Metal Co.; AIST Foundation president, **Randy Skagen** of Nucor Steel Tuscaloosa Inc.; AIST Golf Committee chair, **Tom Russo**; as well as all AIST members, authors and exhibiting companies who were involved in planning AISTech 2010.

AISTech 2011 — The Iron & Steel Technology Conference and Exposition is scheduled for May 2–5, 2011, at the Indiana Convention Center in Indianapolis, Ind. Abstracts for this major international conference are being sought now for presentation at the event. AISTech will feature international technologies from around the world, allowing steel producers to compete in today's global steel market. Don't delay in reserving your company's booth for next year. For more information or to reserve your space, contact Geraldine Kane (724) 814-3022, gkane@aist.org or Jeffrey Campbell (724) 814-3030, jcampbell@aist.org.

AISTech Town Hall Forum participants pictured below, left to right: Dick Teets, Mario Longhi, James Frias, Andrew Harshaw, moderator Jon Delano, Gretchen Haggerty, AIST President Tony Bridge, Gary Novak, Dieder Hoeppli, AIST executive director Ronald Ashburn, and Town Hall chair George Koenig. ♦

