



Student Wrap-up

The AIST Foundation, with support from six industry companies, held special student-specific programs at AISTech 2010 in Pittsburgh, Pa., May 3-6. The corporate sponsors were ArcelorMittal, Ellwood Group Inc., Nucor Corporation, SSAB, Steel Dynamics Inc., and TMK-IPSCO.

Corporate Sponsors – Student Events



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 Koppel Tubulars Company in Ambridge, Pa. They 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 Manager, followed by industry experience, accomplishments and goals from three different perspectives. 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 ten years, moving up in responsibilities. 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 the corporate sponsor representatives.



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 Corporation, **Jim Wharrey** from TMK-IPSCO, and **Kevin Bort** from Steel Dynamics Inc., who also acted as 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 Gerson** 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 **Hanna Terwelp** from Missouri University of Science & Technology, for their presentation entitled “*Antimicrobial Applications of Copper Alloys,*” were 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 “*3D Simulation of a Chemical Leaching Tank for Improved Solids Suspension,*” discussing a process to remove impurities from iron ores by chemical leaching was modeled using Computational Fluid Dynamics (CFD) to study the level of suspension of the iron ore inside the tank. The results then were 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,*” where he discussed 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.

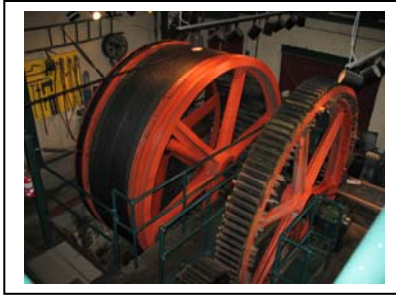


Following the contest, tickets were drawn for door prizes donated by SMS Siemag LLC, Ellwood Group Inc., Nucor Corporation, SSAB and AIST. We would like to express a special thanks to the contest chair, **Kevin Bort** from Steel Dynamics Inc., along with all contest judges and companies who donated the 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 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 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.

From the students:

Being able to attend as a student was great; the technical sessions I attended were interesting, and I feel that the networking opportunities I had were excellent.

Tom Roesel
Junior, Mechanical Engineering
Purdue University Calumet

The undergraduate presentation competition is a great experience to learn about other student projects. It also helps to develop our own sense of research discussion.

Lancelot Guoheng Chen
Purdue University Calumet

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

It is a good opportunity for me to participate the Student Project Presentation Contest in such a big conference of AIST. Despite I haven't got the final prize, the experience is also a valuable asset for me. Standing in front of the professional judges and many industrial engineers needs courage, which I lacked before. Thinking back, the process of preparing is unforgettable. Doing the project, making the power point, practicing the presentation, everything needs to get well prepared. Thinking about the last day before the contest, staying all night to practice, my eyes are filled with tears. During that time, I learned how to focus, how to work hard, and how to learn.

Song Zhang
Senior, Mechanical Engineering
Purdue University Calumet

I had a great experience at the 2010 AISTech conference. It was my first experience with AISTech, and 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 that is devoted to steelmaking. Even as a participant in the Student Presentation Contest, I was interested and excited about the research being performed at the academic level. I look forward to future visits to AISTech!

Gabriel Gerson

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 student from other schools in similar programs to mine. It was a valuable networking event for me and I had a great time.

Aleksandr Shmagranoff
Sophomore, Mechanical Engineering
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 and Technology

As a graduate student, I felt the conference had provided a great opportunity for me to share research experience with others. After attending the presentations, I've got new ideas about how to improve the project which we currently working on. I really enjoyed talking to different people during the networking events.

Dong Fu
Ph.D Student, Mechanical Engineering
Purdue University Calumet

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 to 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 how to cope 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 meeting. 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
Senior, Mechanical Engineering
Purdue University Calumet