



IN PARTICIPATION WITH



MSEC 2013 NAMRC 41

ASME INTERNATIONAL MANUFACTURING SCIENCE AND ENGINEERING CONFERENCE

**JUNE 10-14, 2013
MADISON, WISCONSIN**

SME NORTH AMERICAN MANUFACTURING RESEARCH CONFERENCE

CONFERENCE PROGRAM





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UW-Madison's
Agricultural Hall



Welcome Letter from Host of MSEC 2013 / NAMRC 41

Welcome to the 8th International Manufacturing Science and Engineering Conference (MSEC 2013) of the American Society of Mechanical Engineers (ASME) and the 41st North American Manufacturing Research Conference (NAMRC 41) of the North American Manufacturing Institution in the Society of Manufacturing Engineers (NAMRI/SME). These two advanced manufacturing research conferences are co-located at the Frank Lloyd Wright designed Monona Terrace Community and Convention Center in Madison, WI, USA to better serve the needs of the manufacturing community.

This conference includes 266 technical papers and posters submitted by academic, industrial, and government participants from 26 countries that will be presented at the conference. Four panels and roundtable discussions will cover manufacturing's 'missing middle,' geometric interoperability, and sustainable manufacturing. Three invited speakers, Tom Kurfess, Ralph Resnick, and Mike Molnar will provide insights into the federal government's efforts related to manufacturing with a specific focus on the National Network for Manufacturing Innovation (NNMI). An early career forum will provide knowledge of various career paths in industry, academia, government organizations, national laboratories, and technology entrepreneurs. A National Science Foundation Workshop will focus on research funding opportunities and programs for commercialization of manufacturing research. A student manufacturing design competition will highlight talented teams of undergraduate students from around the world. This list of technical activities help this conference provide an international forum in which global academic, government and industry researchers, engineers, and technical leaders can interact and address pressing issues and the latest developments related to advanced manufacturing.

I would like to thank the numerous individuals who have helped bring this event together and make it a success. Special thanks to the scientific committees, the reviewers, the symposium and session chairs, and student volunteers who volunteered their time to this conference. In particular, I would like to acknowledge Laine Mears and Ihab Ragai of MSEC 2013 and John Ziegert of NAMRC 41 for the enormous amount of time and effort they volunteered for collecting manuscripts, running the review process, and organizing the technical papers and posters that were submitted to these co-located conferences. I wish to acknowledge the generous financial support of our sponsors without whom all of the activities in this conference would not be possible. Specifically, I would like to thank those sponsors who provided funds to help defray the cost to students attending this conference.

Thank you for participating and I hope that you find the conference to be an intellectually stimulating and professionally productive experience and that your stay in Madison is comfortable and enjoyable.



Frank E. Pfefferkorn, Ph.D.
Host, MSEC 2013 / NAMRC 41
Associate Professor
University of Wisconsin-Madison



As the chair of the Conference Coordinating Committee, I would like to welcome you to the third collocated ASME International Manufacturing Science and Engineering Conference and SME North American Manufacturing Research Conference. We are very fortunate to be in beautiful Madison, Wisconsin and truly appreciate the efforts of Frank Pfefferkorn and others at the University of Wisconsin for hosting us. Another special acknowledgement is required for John Ziegert, Laine Mears and Ihab Ragai who are the technical program chairs for the two conferences. A quality event of this size and stature does not happen without considerable effort from several individuals, including these selfless volunteers. We should all extend our thanks to our hosts and the technical program chairs for all of their hard work when you see them at the conference. Finally, I would like to thank the members of the Conference Coordinating Committee, Drs. Robert Ivester, Shreyes Melkote, John Ziegert, Xiaoping Yang, and Laine Mears, for their dedication and efforts to the strategic planning of this conference and future ones.

In closing, on behalf of the Conference Coordinating Committee members, I wish you a productive conference and hope you will take advantage of this international conference setting to meet old friends, make new acquaintances, and establish new collaborations. Enjoy the conference!



Brad Kinsey

Brad Kinsey
University of New Hampshire



View of Memorial Union from
Library Mall



SCOTT WALKER
OFFICE OF THE GOVERNOR
STATE OF WISCONSIN

P.O. BOX 7863
MADISON, WI 53707

March 19, 2013

Greetings!

On behalf of the citizens of Wisconsin, I would like to officially welcome the 2013 Manufacturing Science and Engineering Conference and 41st North American Manufacturing Research Conference to our Capitol city. Wisconsin is a leader in manufacturing, and we are delighted to host you.

The City of Madison will provide a perfect background for your event. While you are here, I hope you will have the opportunity to enjoy the natural beauty and the wholesome quality of life that is found throughout the region. From biking and hiking paths found along our lakes and throughout the University of Wisconsin – Madison campus, to our restaurants and many cultural attractions, Madison offers something for everyone.

With our tremendous workforce and recently enacted regulatory and tax reforms, Wisconsin is once again Open for Business. And, my Administration stands ready to assist anyone interested in creating new jobs in our great state.

On behalf of the State of Wisconsin, please accept my welcome and invitation to experience all that the greater Madison area has to offer. I hope that you will enjoy your visit, and I wish you all the best for a successful conference.

Sincerely,

A handwritten signature in black ink that reads "Scott Walker".

Scott Walker
Governor

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Office of the Mayor

Paul R. Soglin, Mayor

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210 Martin Luther King, Jr. Boulevard
Madison, Wisconsin 53703-3345
PH 608 266 4611
FAX 608 267 8671
www.cityofmadison.com
mayor@cityofmadison.com

March 20, 2013

Welcome to Madison!

As Mayor, I take great pleasure in welcoming the 2013 Manufacturing Science and Engineering Conference and the 41st North American Manufacturing Research Conference to our Capital city. I am impressed with the work your organizations have done and continue to do in the field of advanced manufacturing research.

I hope you enjoy your visit to our city. Madison's energetic downtown, cultural attractions and endless recreational opportunities offer the perfect complement to your event. From the distinguished University of Wisconsin-Madison campus to Olbrich Botanical Gardens and the beautiful and unique shops and restaurants, there is something for everyone to enjoy. Like all of our visitors, I know your group will enjoy a truly authentic experience here in Madison.

On behalf of all Madison residents, businesses, and organizations, please accept my warm welcome and invitation to experience all the possibilities available in greater Madison.

Best wishes for a successful event!

Sincerely,



Paul R. Soglin
Mayor

PRS/lao



Lake Mendota at Sunset



Tuesday, June 11, 2013

9:00 – 10:00

➔ Ballroom AB

TOM KURFESS, Ph.D., P.E.

Professor

The George W. Woodruff School of Mechanical Engineering

Georgia Institute of Technology

Atlanta, Georgia USA

MANUFACTURING, THE ROAD TO SUCCESS

Manufacturing has been identified as President Obama's number one priority, as it is critical for the economic prosperity and national security of the United States of America. Dr. Thomas Kurfess, who served as the Assistant Director for Advanced Manufacturing in the Office of Science and Technology Policy in the Executive Office of the President of the United States of America, was the technical lead for the President on the current federal efforts related to manufacturing. Dr. Kurfess will present an overview of the Administration's endeavors in advancing manufacturing with a focus on the National Network for Manufacturing Innovation (NNMI) which was discussed in the 2013 State of the Union Address. The NNMI will be presented as it relates to the historic development of interests in manufacturing, and its place in the overall federal manufacturing strategy identifying the technical and cultural strengths of the Nation that can be leveraged to strengthen the country's manufacturing base.

BIO

Thomas R. Kurfess received his S.B., S.M. and Ph.D. degrees in mechanical engineering from M.I.T. in 1986, 1987 and 1989, respectively. He also received an S.M. degree from M.I.T. in electrical engineering and computer science in 1988. Following graduation, he joined Carnegie Mellon University where he rose to the rank of Associate Professor. In 1994 he moved to the Georgia Institute of Technology where he rose to the rank of Professor in the George W. Woodruff School of Mechanical Engineering. In 2005 he was named Professor and BMW Chair of Manufacturing in the Department of Mechanical Engineering at Clemson University's International Center for Automotive Research. In 2012 he returned to Georgia Tech as a Professor of Mechanical Engineering. During 2012-2013, he was on leave serving as the Assistant Director for Advanced Manufacturing at the Office of Science and Technology Policy in the Executive Office of the President of the United States of America. In this position he had responsibility for engaging the Federal sector and the greater scientific community to identify possible areas for policy actions related to manufacturing. He was responsible for coordinating Federal advanced manufacturing R&D, addressing issues related to technology commercialization, identifying gaps in current Federal R&D in advanced manufacturing, and developing strategies to address these gaps.



Thursday, June 13, 2013

08:30 - 9:15

📍 Ballroom AB

MICHAEL F. MOLNAR

Chief Manufacturing Officer

Office of the Director

National Institute of Standards and Technology (NIST)

BUILDING THE NNMI – TOWARDS A NEW INNOVATION ECOSYSTEM FOR ADVANCED MANUFACTURING

A key challenge to restoring U.S. leadership in advanced manufacturing is addressing the so-called “missing middle” – the technical and business barriers of scaling-up an innovative new material, process, or technology for robust production use. This plenary talk explores the National Network for Manufacturing Innovation as a means to accelerate U.S. innovation. As proposed by the President NNMI is a network of manufacturing institutes where Industry and Academia partner on industry-relevant challenges. Each institute would be chartered in a competitively selected topic and focus on nationally important, precompetitive technologies to create “innovation hubs” for transformational impact. This keynote will review the NNMI progress to date, including the current design of the institute and supporting network and core functions. The emerging design builds on the extensive public input and the progress of the pilot institute on Additive Manufacturing, explored in detail in the following plenary. The discussion concludes with a review of the three manufacturing institutes topics being established this year.

BIO

Mike Molnar likes to be introduced simply as “a manufacturing guy from industry”. After nearly thirty years in the private sector he recently was named as the first Chief Manufacturing Officer of the National Institute of Standards and Technology, and also appointed director of the interagency National Program Office for Advanced Manufacturing. As called for by the Advanced Manufacturing Partnership initiative, the NPO’s mission is to foster industry-led partnerships and to form a “whole of government” approach to strengthen competitiveness and innovation in U.S. manufacturing. Mike’s experience includes leadership roles in advanced manufacturing, metrology, manufacturing systems, quality, technology development, sustainability and industrial energy efficiency. His credentials include service as a Federal Fellow in the White House Office of Science and Technology Policy, and election as Fellow of both the American Society of Mechanical Engineers and the Society of Manufacturing Engineers. He is a licensed Professional Engineer, a Certified Manufacturing Engineer and a Certified Energy Manager. He received a Master of Business Administration from the University of Notre Dame, and both a Master of Science in Manufacturing Systems Engineering and a Bachelor of Science in Mechanical Engineering from the University of Wisconsin. He is an active member of professional societies, consortia and volunteer organizations.



Thursday, June 13, 2013

9:15 – 10:00

🔴 Ballroom AB

RALPH RESNICK

President and Executive Director, National Center for Defense Manufacturing and Machining (NCDMM)

Founding Director, National Additive Manufacturing Innovation Institute (NAMII)

BUILDING THE NAMII – LESSONS LEARNED ON ADVANCED MANUFACTURING PARTNERSHIPS

The initial step in building the NNMI collaborative infrastructure required the creation of a pilot institute to serve as a prototype for subsequent NNMI institutes. The National Additive Manufacturing Innovation Institute (NAMII) is a public-private partnership with member organizations from industry, academia, government, and workforce development resources all collaborating with a singular, shared vision – to transition additive manufacturing technology to the mainstream U.S. manufacturing sector and create an adaptive workforce capable of not only meeting industry needs but also increasing domestic manufacturing competitiveness.

This keynote will review NAMII progress on and future plans for projects, education and outreach, organizational governance and an evolving collaborative process.

BIO

Mr. Resnick joined NCDMM in September 2008 as Vice President, Chief Technology Officer and Director Corporate Development with more than 30 years of manufacturing experience. He assumed the position of President and Executive Director in May 2011. The NCDMM is a not-for-profit 501(c)3 company whose mission is to proactively engage with all branches of the U.S. military and its industrial base to control cost and improve productivity and performance of manufactured parts and assemblies. Upon NCDMM organizing and winning the competitive National Additive Manufacturing Innovation Institute (NAMII) contract in August 2012, Mr. Resnick also assumed the position of Acting Director at NAMII. Currently, Mr. Resnick is a Fellow of SME and the Chairman of SME's International Awards and Recognition Committee. In 2010, Mr. Resnick received the NAMRI/SME "Outstanding Lifetime Service Award."

SCHEDULE AT A GLANCE



MONDAY, JUNE 10, 2013

- 8:00 – 15:00 NAMRI/SME Board Meeting → Dane Room, Level 2
- 12:30 – 19:30 Registration Open → Registration Booth 3 & 4
- 13:00 – 17:00 Optional National Science Foundation Workshop → Hall of Ideas E
- 14:45 – 15:30 Local Student Worker Volunteer Orientation Training
→ Hall of Ideas G
- 15:00 – 17:00 Sponsors Move-In to Sponsorship Booths → Capital Promenade
- 15:20 – 18:00 Optional UW Madison and MATC Manufacturing Lab Tours
- 17:00 – 19:30 Welcome Reception (appetizers and bar service) Sponsored by MAG
→ Grand Terrace

TUESDAY, JUNE 11, 2013

- 7:00 – 18:00 Registration Open → Registration Booth 3 & 4
- 7:00 – 8:30 Continental Breakfast → Grand Terrace - sponsored by LasX Industries
- 7:30 – 8:00 Session Chairs Meeting and Audio Visual Training → Hall of Ideas G
- 8:00 – 17:00 Sponsorship Booths Open → Capital Promenade
- 8:30 – 8:40 Welcome by Frank Pfefferkorn, Conference Chairperson → Ballroom AB
- 8:40 – 8:50 Welcome by Dean Ian Robertson, UW-Madison School of Engineering
→ Ballroom AB
- 8:50 – 9:00 Welcome by Dean Kenneth Starkman, Madison Area Technical College
School of Applied Science, Engineering and Technology Dean
- 9:00 – 9:05 Remarks by Alicona GmbH
- 9:05 – 10:00 Keynote Address by Professor Tom Kurfess on the U.S. Advanced
Manufacturing Policy → Ballroom AB
- 10:00 – 10:30 Beverage Break → Grand Terrace
- 10:30 – 12:00 Concurrent Sessions A
- 12:00 – 13:30 Buffet Lunch → Ballroom AB - Sponsored by NCD Technologies with
presentation by the 2013 ASME International Merchant Award recipient,
Bryan Dods (GE Power & Water)

13:30 – 15:00	Concurrent Sessions B
15:00 – 15:30	Beverage Break ➔ Grand Terrace
15:00 – 17:00	ASME/MED Executive Committee Meeting ➔ Dane Room
15:30 – 17:00	Concurrent Sessions C
17:00 – 20:00	Early Career Forum ➔ Ballroom B
17:00 - 17:45	MED Member Meeting ➔ Ballroom A
17:45 - 18:00	Joint MED/NAMRI Session
18:00 – 18:45	NAMRI Member Meeting ➔ Ballroom A
18:45 – later	Optional Ale Asylum Brewing Tour and Social Outing Shuttles departing

WEDNESDAY, JUNE 12, 2013

7:00 – 17:15	Registration Open ➔ Registration Booth 3 & 4
7:00 – 8:30	Continental Breakfast ➔ Grand Terrace
8:00 – 17:00	Sponsorship Booths Open ➔ Capital Promenade
8:30 – 10:00	Concurrent Sessions D
10:00 – 10:30	Beverage Break ➔ Grand Terrace - sponsored by MT Connect
10:30 – 12:00	Concurrent Sessions E
12:00 – 13:30	Buffet Lunch and NAMRI/SME Founders Lecture ➔ Ballroom AB
13:30 – 15:00	Concurrent Sessions F
15:00 – 15:30	Beverage Break ➔ Grand Terrace - sponsored by Kistler
15:20 – 18:00	Optional UW Madison Manufacturing Lab Tour
15:30 – 17:00	Concurrent Sessions G
18:00	Reception and Awards Banquet (cocktails and live music)
19:00	Plated Sit Down Dinner (bring your meal ticket!)
20:00	Conferring of Awards ➔ Monona Terrace Rooftop
22:00	Banquet Shuttle to Lowell Center Inn
22:00	Evening Concludes

SCHEDULE AT A GLANCE, cont.



THURSDAY, JUNE 13, 2013

- 7:00 – 17:15 Registration Open → Registration Booth 3 & 4
- 7:00 – 8:00 Exhibitor Move-in and Poster Set Up → Grand Terrace
- 7:00 – 8:30 Continental Breakfast → Grand Terrace - sponsored by DP Technology
- 7:00 – 8:30 am University of Wisconsin Alumni Breakfast
→ Hilton Hotel Chop House
- 8:00 – 21:00 Sponsorship Booths Open → Capital Promenade
- 8:15 – 8:30 Announcements → Ballroom AB
- 8:30 – 9:15 Keynote Speaker Ralph Resnick, National Center for Defense Manufacturing and Machining → Ballroom AB
- 9:15 – 10:00 Keynote Speaker Michael F. Molnar, National Institute of Standards and Technology → Ballroom AB
- 9:00 – 21:00 Industrial Exhibition → Grand Terrace
- 10:00 – 10:30 Beverage Break → Grand Terrace - sponsored by Alliance for American Manufacturing
- 10:30 – 12:00 Concurrent Sessions H
- 12:00 – 13:30 Buffet Lunch and Presentation on Research in Germany, Ballroom AB - Sponsored by Research in Germany
- 13:30 – 15:00 Concurrent Sessions I
- 15:00 – 15:30 Beverage Break → Grand Terrace - sponsored by Carl Zeiss Industrial Metrology
- 15:30 – 17:00 Concurrent Sessions J
- 17:00 – 21:00 Industrial Expo
- 17:00 – 19:00 Poster Session – Sponsored by Aerotech with Wisconsin beer, brats and cheese!
- 21:00 – 21:30 Exhibit Booth and Poster Move Out

FRIDAY, JUNE 14, 2013

7:00 – 12:00	Registration Open ➔ Registration Booth 3 & 4
7:00 – 8:30	Hot Breakfast ➔ Grand Terrace
8:00 – 13:00	Sponsorship Booths Open ➔ Capital Promenade
8:30 – 10:00	Concurrent Session K
10:00 – 10:30	Beverage Break ➔ Grand Terrace
10:30 – 12:00	Concurrent Sessions L
12:00 – 13:00	Boxed Lunch To Go ➔ Grand Terrace
12:15 – 15:00	UW Madison Manufacturing Lab Tour
12:30	Optional Industry Tours Depart
12:30	Shuttle departs to the Dane County Regional Airport
12:30 – 13:00	Sponsorship Booth Move Out
13:00	Registrations Close
17:00	Optional Industry Tours Return

SATURDAY, JUNE 15, 2013

6:00 – 14:00	Dane County Farmers' Market (largest producer-only market in the U.S.), around the Capitol Square
9:00 – 17:00	Canoe Trip on the Wisconsin River with Picnic Lunch, departs from the Hilton Hotel adjacent to Monona Terrace (<i>optional</i>)

Memorial Union
Terrace



EARLY CAREER FORUM



The goal of this Early Career Forum (ECF) is to provide recent advanced-degree graduates and current graduate students with information and knowledge of various career paths in industry, academia, government organizations, and national laboratories, or as technology entrepreneurs. Panelists who have taken these various career paths will present keys for successful career development.

Fee: \$5 per participant (includes refreshments). Organizers:

Prof. Hitomi Yamaguchi
Mechanical & Aerospace
Engineering
University of Florida
Phone: 352-392-0812
E-mail: hitomiy@ufl.edu

Prof. Frank Pfefferkorn
Mechanical Engineering
University of Wisconsin-
Madison

Dr. Cedric Z. Xia
Ford Motor Company

Prof. Brad Kinsey
Mechanical Engineering
University of New Hampshire

AGENDA:

17:00 – 17:15 Opening/Introduction

SESSION 1

17:15 – 17:40 Careers in Academia

Professor Thomas R. Kurfess (Georgia Institute of Technology)
Professor Karl R. Haapala (Oregon State University)
Professor Michael R. Zinn (University of Wisconsin-Madison)
Dean Ken Starkman (Madison Area Technical College)

17:40 – 18:00 Careers in Government Organizations and National Laboratories

Dr. Zhijian (ZJ) Pei (National Science Foundation)
Dr. Ali Sayir (Air Force Office of Scientific Research)
Dr. Shawn P. Moylan (National Institute of Standards and Technology)

18:00 – 18:20 Careers in Industry (Small and Big Business)

Dr. Ihab Ragai (Hitachi Truck Manufacturing)
Dr. Ramasubramani (Ram) Kuduva Raman Thanumoorthy (3M)
Dr. Rajesh V. Mehta (National Science Foundation)

18:20 – 18:45 Questions and Answers

SESSION 2

18:45 – 18:20 Breakout Discussions

19:20 – 20:00 Reception

EARLY CAREER FORUM PANELISTS



THOMAS R. KURFESS

Thomas R. Kurfess received his S.B., S.M. and Ph.D. degrees in mechanical engineering from M.I.T. in 1986, 1987 and 1989, respectively. He also received an S.M. degree from M.I.T. in electrical engineering and computer science in 1988. Following graduation, he joined Carnegie Mellon University where he rose to the rank of Associate Professor. In 1994 he moved to the Georgia Institute of Technology where he rose to the rank of Professor in the George W. Woodruff School of Mechanical Engineering. In 2005 he was named Professor and BMW Chair of Manufacturing in the Department of Mechanical Engineering at Clemson University's International Center for Automotive Research. In 2012 he returned to Georgia Tech as a Professor of Mechanical Engineering. During 2012-2013, he was on leave serving as the Assistant Director for Advanced Manufacturing at the Office of Science and Technology Policy in the Executive Office of the President of the United States of America. In this position he had responsibility for engaging the Federal sector and the greater scientific community to identify possible areas for policy actions related to manufacturing. He was responsible for coordinating Federal advanced manufacturing R&D, addressing issues related to technology commercialization, identifying gaps in current Federal R&D in advanced manufacturing, and developing strategies to address these gaps.



DR. HAAPALA

Dr. Haapala is an Assistant Professor in the School of Mechanical, Industrial, and Manufacturing Engineering at Oregon State University, where he directs the Industrial Sustainability Laboratory. He serves as chair of the Life Cycle Engineering Technical Committee of the ASME Manufacturing Engineering Division. He previously served as Research Engineer and Instructor within the Department of Mechanical-Engineering Engineering Mechanics at Michigan Technological University. He received his B.S. and M.S. in Mechanical Engineering from Michigan Tech. He received his Ph.D. in Mechanical Engineering-Engineering Mechanics from Michigan Tech and was a doctoral exchange student in the Ph.D. Program in Public Policy at Southern University – Baton Rouge, LA as an NSF IGERT trainee. His research addresses sustainable design and manufacturing challenges, including life cycle engineering, manufacturing process modeling, and sustainable engineering education. He has received funding from the National Science Foundation, U.S. Army, Oregon Metals Initiative, and industrial companies. His work has appeared in over 40 peer-reviewed chapters, proceedings, and journals.



PROFESSOR ZINN

Professor Zinn joined the faculty at the University of Wisconsin - Madison in 2007. His research interests are broadly directed at understanding and overcoming the design and control challenges of complex electro-mechanical systems with a primary focus on human-centered robotics. His focus on human-centered robotics spans multiple application areas including manufacturing, medical devices, and haptics. Current projects include investigation of robotic friction stir-welding, development of robotic interventional medical systems and investigation of high-power large workspace haptic interfaces.

EARLY CAREER FORUM PANELISTS



Prior to joining the UW-Madison faculty, he was Director of Systems and Controls Engineering at Hansen Medical where he helped to develop the world's first commercially available minimally invasive flexible surgical robotic system. In addition to his experience at Hansen Medical, he has over 10 years of electro-mechanical system design and manufacturing experience in aerospace and high-technology industries. Professor Zinn has a BS and MS from M.I.T. and a Ph.D. in Mechanical Engineering from Stanford University.



KEN STARKMAN

Ken Starkman is the Dean for the School of Applied Science, Engineering and Technology at Madison College, Madison, Wisconsin. The school consists of over sixty programs that lead to a certificate, diploma or degree in accordance with the Wisconsin Technical College System. Current efforts include an innovative regional training delivery curriculum funded by the U. S. Economic Development Administration, implementation of the Ingenuity Center, hybrid and alternative transportation system training, highly advanced biotechnology labs, and engineering and specialized applied science programs. He provides leadership to state and national boards and committees as well as regional technical advisory committees. The college is supported by a large and growing number of business and industry partners both local and nationally. Madison College has won numerous awards and distinctions earned by the nearly 2,000 full and part time faculty and its 40,000 students. He is currently a doctoral student (ABD) at Edgewood College studying leadership and holds a Master's Degree in Technology Education from the University of Wisconsin – Stout.



Z.J. PEI

Z.J. Pei received his PhD in Mechanical Engineering from University of Illinois at Urbana-Champaign. He had worked as a post-doc for a year and in industry (as process engineer, mechanical engineer, research scientist, and applications engineer in four companies) for four years before joining Kansas State University where he is currently a professor. Since August 2012, he has been serving as the program director of the Manufacturing Machines and Equipment program at National Science Foundation. He has graduated 7 PhD and 6 MS students, and currently works with 4 PhD students. Among his 7 graduated PhD students, 5 found academic positions and 2 landed US industry jobs upon graduation, and 1 has received NSF CAREER award.



DR. SAYIR

Dr. Sayir is currently the Program Manager of High Temperature Aerospace Materials at AFOSR. Dr. Sayir received his Ph. D. in 1990 in Materials Science and Engineering from Case Western Reserve University and held a Diplom Ingenieur Degree from the Technical University of Clausthal, Germany. Dr. Sayir joined NASA Lewis Research Center (now Glenn) in 1990 as a National Research Counsel awardee. Upon joining NASA Glenn, he began a career of eutectic solidification and basic research in polyphase

microstructures. He has made contributions in the development and use of advanced high strength, single crystal fibers for high temperature applications, piezo-ceramics with higher temperature capability for actuation devices, and thermoelectric materials and space power applications.

Dr. Sayir has served on national and international committees, published over 110 peer reviewed papers and has over 40 invited presentations for the American Ceramic Society, American Physical Society, European Ceramic Society, Electrochemical Society and Materials Research Society. He organized five International Workshops and co-organized 11 symposiums with American Ceramic Society and published over 110 peer-reviewed journal publications. He has been a Fellow of the American Ceramic Society since 2010. He received the Medal for Public Service Award (2003), R & D 100 Award for Laser Fiber Growth (1993), NASA Inventions Board Awards (2009, 2008, 2007), and received numerous recognitions from Industry and government laboratories.

As Point of Contact for Materials and Structures of NASA Hypersonic program, he coordinated materials and structures projects between NASA centers, Department of Defense, Industry and Academia. Dr. Sayir has been serving since 2005 as the Director of an international Air Force Office of Scientific Research (AFOSR) funded program to develop directionally solidified boride eutectics. Since 2008 he has held a Research Associate Professor faculty appointment at Case Western Reserve University in the Department of Materials Science of Engineering and since 2005 has held an adjunct faculty appointment in the Department of Mechanical Engineering at the University of Akron.



DR. SHAWN MOYLAN

Dr. Shawn Moylan is a Mechanical Engineer in the Intelligent Systems Division of the Engineering Laboratory at the National Institute of Standards and Technology (NIST). He came to NIST as a National Academy of Sciences/National Research Council Postdoctoral Research Associate in January 2006. While at NIST, Dr. Moylan has worked on a variety of projects in manufacturing metrology, including measurement science for additive manufacturing, smart machine tools, five-axis coordinated motion metrology, on-machine metrology for micro/mesoscale parts and machine tool metrology. Dr. Moylan earned a Ph.D. from Purdue University in 2006 through the School of Industrial Engineering and is a graduate of the University of Notre Dame with a B.S. in Mechanical Engineering.



IHAB RAGAI

Ihab Ragai is a mechanical engineer whose areas of expertise are finite element analysis, material characterization, stress analysis, design of aerospace and automotive components and systems, and manufacturing processes. He has been with Hitachi since 2007 as a Senior Project Engineer responsible for product development and research projects. He is currently the Senior Engineering Manager of Technical Analysis and Design, overseeing all projects related to product/process optimization, truck dynamics, fatigue analysis, frame/body design, drive system components design, material selection, and manufacturing processes including casting, forging, welding, and sheet forming. Prior to join-

EARLY CAREER FORUM PANELISTS



ing Hitachi, Ihab worked on several research and industrial projects with ABB Germany, McDonnell Douglas Aerospace USA, Pratt & Whitney Canada, Canada Network of Centres of Excellence (AUTO21), and Canadian Institute of Aerospace Research. He is a registered Professional Engineer in the province of Ontario, Canada. He is a recipient of several national and international awards in the field of mechanical engineering. Ihab was born in Egypt and educated in Egypt, Germany, the US and Canada.



RAM THANUMOORTHY

Ram Thanumoorthy received his undergraduate degree in Chemical Engineering from Bharathiar University, India and after a brief stint in Polymer Research completed his M.S in Polymer Science and Engineering from the Indian Institute of Technology (IIT), New Delhi, India. After his Ph.D with major in Polymer Science and Engineering from Georgia Institute of Technology, Atlanta, he joined 3M as a

Senior Research Engineer in 2010. He currently works in the Corporate Research Laboratory of 3M in Maplewood, MN and is involved in injection molding related research activities. He works primarily in the molding process and materials development. Over the course of his career, he has worked in different areas of polymer research such as synthesis, processing and rheology.



RAJESH MEHTA

Rajesh Mehta is a Program Director in the Small Business Innovation Research Program at the National Science Foundation. His focus areas include Nanotechnology, Advanced Materials, Manufacturing, and Biological and Chemical Technologies.

Prior to joining NSF in 2012, he was a senior research technologist at Kodak where his 26-year career spanned work at Kodak Research Laboratories, and Manufacturing Research and Engineering Organization. His work covered a broad range of materials science based technologies related to photographic film and paper manufacturing, thermal, inkjet, and electro-photographic printing, and OLED device manufacturing. He has a B. Tech. degree in Chemical Engineering from Indian Institute of Technology, Bombay, M.S. and Ph.D. degrees in Chemical Engineering from Penn State, and a M.S. degree in New Product Development from Rochester Institute of Technology.



Wednesday, June 12, 2013

10:30 - 12:00

🔴 Hall of Ideas G

FILLING IN THE MANUFACTURING 'MISSING MIDDLE'

The purpose of this panel will be to hear from individuals and organizations who currently serve the manufacturing 'missing middle' so that attendees can hear various perspectives on how they manage the work in this space. Panelists will be chosen so that they represent a variety of business unit scales, operational philosophies and geographical locations. Attendees will have an opportunity to ask these organizations questions so that they will have a clearer idea of what's involved in working in the 'missing middle'. This is expected to be especially valuable to any organization considering a proposal for an Innovative Manufacturing Institute as part of the National Network for Manufacturing Innovation (NNMI). Topics are expected to include a general discussion how operating in this space is different from either academia or industry, the sometimes mismatched objectives of academia and industry, project management techniques, intellectual property, and the skills required to work in this space.

Dr. William Hartman
Executive Director
Fraunhofer USA

Paul T. Evans
Director, Manufacturing Systems
Southwest Research Institute

Craig Salvalaggio
Engineering Manager
Applied Manufacturing Technologies

Glenn Saunders
Senior Research Engineer
Center for Automation Technologies and
Systems

Dr. Jay C. Rozzi
Principal Engineer
Creare Inc



View of Lake Mendota from
Memorial Union



Thursday, June 13, 2013

10:30 - 12:00

📍 Hall of Ideas G

GEOMETRIC INTEROPERABILITY FOR ADVANCED MANUFACTURING

This panel will focus on the advanced manufacturing in the context of model-based engineering in general, and composite structure manufacturing in particular, as viewed by researchers and industry. Limited or poor geometric interoperability of the software supporting manufacturing and other engineering activities within the product lifecycle is becoming a barrier not only for model-based engineering but also curtails the potential benefits of platform-based engineering, cloud-based solutions, and other major trends in advanced manufacturing. This panel will bring together experts from manufacturing industry, software vendors, standards community and researchers to explore the challenges and potential solutions to the problem of geometric interoperability in advanced manufacturing.

Dr. Thomas Grandine
Senior Technical Fellow
The Boeing Company

Vadim Shapiro
Professor, University of Wisconsin and
Founder, Intact Solutions, LLC

Rani Richardson
CATIA Composites Product Specialist
Dassault Systemes

Dr. Vijay Srinivasan
Division Chief, System Integration Division
National Institute of Standards and Technology

Dr. Dean Robinson
Manager, Model-Based Manufacturing Lab
GE Global Research

View of the Armory and
Gymnasium or 'Red Gym'



Thursday, June 13, 2013

13:30 - 15:00

🔴 Hall of Ideas G

SUSTAINABLE MANUFACTURING APPROACHES: COLLECTIVELY, ARE WE STRONGER?

There are a number of approaches and tools that look to quantify manufacturer efforts in regards to sustainability. Some look at the business aspects while others look at manufacturing activities and processes. In order to achieve beneficial impact, a collective and consistent practice is necessary. This requires a common outlook regarding terminologies, methodologies, measurement science, and tool development. In this panel we discuss these areas guided with ideas for scalability and standardization.

Moderators

Kevin Lyons
Group Leader, Life Cycle Engineering
National Institute of Standards and Technology
(NIST)

David Dornfeld
Professor
University of California – Berkeley

Speakers

Michael Overcash
“Terminologies – Ontology Development; Methodologies – UPLCI”
Sam Bloomfield Chair in Sustainable Engineered Systems
Wichita State University

Margot Hutchins
“Measurement Science, Tool Development and Standardization”
Associate Director, Laboratory for Manufacturing and Sustainability (LMAS)
University of California – Berkeley

John Mourand
“Making your Business More Sustainable”
Corporate Environmental & Sustainability Director
Briggs & Stratton Corporation

Karen Huber
“Goals/Applications/Experiences”
Division Manager, Manufacturing Technology Research and Development
Caterpillar, Inc.

Sarah Krasely
“Standardization Experience”
Manufacturing Program Manager, Sustainable Solutions
Autodesk



Thursday, June 13, 2013

15:30 - 17:00

➔ Hall of Ideas G

CALL FOR HIGH IMPACT STANDARDS DEVELOPMENT: SUSTAINABLE MANUFACTURING PROCESSES

This “roundtable” session invites all stakeholders and researchers from industries, universities, trade associations, and other government agencies to discuss the formation of a Special Interest Group (SIG) for Sustainable Manufacturing Processes. The SIG will promote standards participation through various avenues with an objective to maximize the benefits for U.S. manufacturing locally and abroad. Today U.S. industries continue to struggle in their efforts to establish progress in influencing or leading the development of important international standards in sustainable manufacturing. An aggressive and effective standards development effort is required to advance sustainable manufacturing practices, elevate energy efficiency, and promote resource effectiveness. U.S. industries need reliable measurement methods, metrics, and guidance to evaluate manufacturing process-related sustainability performance. Such standards development effort could address:

- Information models to serve as the foundation for describing the unit manufacturing processes, process flows, and its functionality.
- Science-based methodology and associated sustainability metrics for unit manufacturing processes.
- Measurement science and methodologies that evaluate and report sustainability performance metrics

Discussion Leader

Kevin Lyons

Group Leader, Life Cycle Engineering

National Institute of Standards and Technology
(NIST)



Lake Mendota at
Sunset

INDUSTRIAL EXPO



POSTER SESSION

Thursday, June 13, 2013

17:00 – 19:00

➡ Grand Terrace

Explore a diverse collection of literature and work at the poster session. Discuss topics that are sure to pique your interest with your peers in a casual, informal setting. Authors will be standing by their posters between 17:00 and 19:00 at the same location and time of the Wisconsin Beer, Brat, and Cheese Reception and the Industrial Exhibition. Only a fraction of the posters that will be on display are included in the conference proceedings.

WISCONSIN BEER, BRAT AND CHEESE RECEPTION

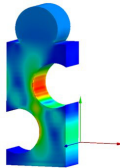
Thursday, June 13, 2013

17:00 – 19:00

➡ Grand Terrace

Discover what makes Wisconsin a distinguished national contender for beer, brats and cheese! Sample enough of the variety of favorites and soon enough you'll develop the palette of a true Wisconsinite. Vegetarian brats will also be served.

ADDITIONAL EXHIBITORS:



**Rockwell
Automation**



SPONSORS:

Rockwell Automation
Midwest Prototyping
Intact Solutions

SCHOOLS & ASSOCIATIONS:

UW-Madison Manufacturing Systems Engineering – A Master of Science Degree Program
UW-Madison Student Vehicle Teams
Society of Manufacturing Engineers
Rochester Polytechnic Institute's Center for Automation Technologies and Systems



ROOFTOP CONCERT

Thursday, June 13, 2013

19:00 – 21:00

➔ Terrace Rooftop

If you would like to get a breath of fresh air, head to the Monona Terrace Rooftop for a free concert featuring Madison County, a popular local country band. This event offers a wonderful opportunity for networking after main conference activities, or to experience downtown Madison nightlife.



Madison County

CONFERENCE SPECIAL PROGRAMS



NATIONAL SCIENCE FOUNDATION WORKSHOP

Monday, June 10, 2013

13:00 – 17:00

➔ Hall of Ideas E

The workshop will last 4 hours and cover four topics. For the first three topics, there will be a 35-minute presentation plus 15-minute discussion. For the last topic, a 15-min introductory presentation will be followed by presentations by some of the recent recipients of SBIR grants.

Topics are:

- NSF funding opportunities for manufacturing faculty
- Portfolio analysis of the NSF Manufacturing Machines and Equipment program
- New NSF merit review criteria & NSF merit review process - a program director's perspective
- NSF SBIR/STTR programs for commercialization of Manufacturing Research

Presenter:

Zhijian Pei, Ph.D.

NSF Program Director, Manufacturing Machines and Equipment (MME) Program

Rajesh Mehta

NSF Program Director, Small Business Innovation Research (SBIR) and Small Business Technology Transfer Program (STTR) program



Primitive Culture

RECEPTION AND AWARDS BANQUET

Wednesday, June 12, 2013

18:00 – 22:00

➔ Monona Terrace Rooftop

Bring banquet meal and drink tickets.

Join us on the rooftop of the Monona Terrace Community and Convention Center for an elegant



dinner, cash bar, live music and the conferring of awards. The Monona Terrace rooftop boasts one of Madison's most spectacular views with the State Capital to the northwest and Lake Monona to the southeast. Music will be provided by Primitive Culture, a band that unites talented musicians for one purpose: to create a unique blend of Funk, Blues, and Tropical rhythms that warms the soul and moves the feet. A conference sponsored shuttle service will run throughout the evening between Monona Terrace and the Lowell Center and Best Western Inn on the Park. No shuttle service necessary to the Hilton, as it is adjacent to Monona Terrace. The shuttle will be waiting at the front door on level 4 and will run in approximately 20 minute loops throughout the evening. Your guests are welcome to the banquet for an additional fee. Stop by the registration desk to inquire. Bring a sweater or a jacket as it can get chilly on the rooftop. The inclement weather location will be Ballroom ABCD.

STUDENT MANUFACTURING DESIGN COMPETITION

Wednesday, June 12, 2013

13:30 – 17:00

➡ Hall of Fame Room

The purpose of the competition is to foster interest in manufacturing, provide the manufacturing engineering community with fresh new perspectives on design, and create a forum for students to share their new and innovative ideas. Any design of a system, component, or process that can be used to promote the art, science and practice of manufacturing engineering was accepted, including:

- Computer integrated manufacturing and robotics
- Machine tools, sensors and controllers
- Manufacturing systems development
- Materials processing
- New areas of manufacturing engineering
- Emerging materials and processes
- Software and hardware solutions contributing to improvements in manufacturing productivity

OPTIONAL TOURS

UW Madison Manufacturing Lab Tours

Monday, June 10, 2013

15:20 Coach departs Monona Terrace

18:00 Coach drops guests at conference sponsored hotels or Monona Terrace

Wednesday, June 12, 2013

15:20 Coach departs Monona Terrace

6:00 pm Coach drops guests at conference sponsored hotels

Friday, June 14, 2013

12:15 Coach departs Monona Terrace.

15:00 Coach drops guests at conference sponsored hotels

Madison Area Technical College Manufacturing Lab Tour

Monday, June 10, 2013

- 15:20 Coach departs Monona Terrace.
- 18:00 Coach drops guests at conference sponsored hotels or Monona Terrace

Ale Asylum Brewery Tour

Tuesday, June 11, 2013

- 18:45 Board coach at Monona Terrace
- 19:00 Brewery tour
- 20:00 First coach departs brewery to drop guests at conference hotels
- 21:15 Last coach departs brewery to drop guests at conference hotels

Tour cost of \$5 includes the brewery tour and transportation. Guests who would like to stay after the tour for a beer and a bite to eat may either take the 9:15pm coach back to their hotel, or call a taxi.

MAG IAS Tour

Friday, June 14, 2013

Fond du Lac, Wisconsin

- 12:20 Tour attendees grab boxed lunch at Monona Terrace and board coach
- 12:30 Coach departs Monona Terrace
- 14:00 Arrive MAG IAS and tour
- 16:00 Coach departs for Madison
- 17:30 Coach drops attendees at conference hotels

MAG IAS' Fond du Lac operations (best known by its former name Giddings & Lewis) started as a small machine shop in 1859 on the same spot as the current factory. MAG IAS specializes in the design and construction of very large CNC machine tools, including:

- Horizontal Boring Mills: <http://www.mag-ias.com/en/mag/products-services/milling/horizontal-boring-mills/pt-series.html>
- Vertical Turning Centers: <http://www.mag-ias.com/en/mag/products-services/turning/vertical-turning-centers/vtc.html>
- Horizontal Machining Centers: <http://www.mag-ias.com/en/mag/products-services/milling/horizontal-machining-centers/hmc-1250-1600.html>
- You will see the design, assembly, and testing of these giants of the CNC machining world. The tour will be given by MAG IAS engineers.

Harley-Davidson Powertrain Operations

Friday, June 14, 2013

Menomonee Falls, Wisconsin

- 12:20 Tour attendees grab boxed lunch at Monona Terrace and board coach
- 12:30 Coach departs Monona Terrace

CONFERENCE SPECIAL PROGRAMS, cont.



14:00	Arrive and tour Harley-Davidson Powertrain Operations, followed by Q&A with H-D engineers
16:00	Coach departs for Madison
17:30	Coach drops attendees at Conference sponsored hotels

Harley Davidson is celebrating its 110th birthday in 2013. Harley Davidson's Pilgrim Road Powertrain Operations facility, also known as the "Home of the Big Twin," produces engines and transmissions for the final assembly plants in York, Pennsylvania, Kansas City, Missouri and for the Parts & Accessories Division in Franklin, Wisconsin. Powertrains for Touring, Softail® and Dyna® motorcycles are produced here. After a tour of the facility there will be a question & answer session with Harley Davidson Manufacturing Engineers.

WISCONSIN RIVER CANOE TRIP

Saturday, June 15, 2013

9:00 – 17:00

This tour will involve a one hour drive to the Wisconsin Riverside Resort in Spring Green, WI through Wisconsin's beautiful country side. A three hour/10 mile canoe trip down the Wisconsin River with a stop for a picnic lunch on a sandbar along the way, and drive back to Madison.

Wear your swim suit and clothing for playing in the sand and the water! A guide will be along with you and life preservers are provided. The Wisconsin river is a grand spot to see some of the natural beauty of this state. The tour will depart at 9:00 am from the front of the Hilton Hotel, adjacent to Monona Terrace. Lunch is provided.

WIN AN IPAD!

Conference attendees who are present in any of the last concurrent session on Friday, June 14, 2013 (10:30 – 12:00) may enter their name in the raffle. One iPad will be given away in each of the concurrent session rooms.

Rules:

- The drawing will take place at the conclusion of the last concurrent session on Friday, June 14, 2013 at approximately 12:00.
- Your conference name tag will serve as your entry into the drawing. You must place your nametag into the raffle drawing box at the beginning of the session at 10:30 when you enter the room.
- You must be present at the time of the drawing to win.
- Your full week conference registration fee must be paid in full in order to be eligible to win.
- One-day registrants, volunteers, conference staff, gratis registrations and conference guests are not eligible to participate in the raffle.

GENERAL INFORMATION



NAME BADGE POLICY

Conference name badges are required for entrance to all Conference events.

REGISTRATION AND INFORMATION DESK

The Conference Registration and Information Desk is located along the west corridor on Level 4.

Hours of Operation:

Monday, June 10	12:30 – 19:30
Tuesday, June 11	7:00 – 18:00
Wednesday, June 12	7:00 – 17:15
Thursday, June 13	7:00 – 17:15
Friday, June 14	7:00 – 13:00

CONFERENCE SHUTTLE BUSES FOR SPECIAL CONFERENCE EVENTS

See the individual event pages for specific information about whether a shuttle will be operating for a given event. When shuttle buses are scheduled, they will pick up/drop off outside the level 4 (ballroom level) doors of the Monona Terrace and shuttle to/from the Lowell Center Inn, The Inn on the Park, and in the case of tours, the Hilton. A conference sign will be displayed in the bus window.

A summary is listed here:

Monday, June 10	Afternoon tours to UW and MATC Labs Evening Welcome Reception
Tuesday, June 11	Ale Asylum Brewery Tour
Wednesday, June 12	Afternoon Tour to UW Lab Evening Banquet
Thursday, June 13	No shuttle service
Friday, June 14	Afternoon tours to UW Lab, MAG, and Harley-Davidson Dane County Regional Airport (one departure from Monona Terrace at 12:30)
Saturday, June 15	Car service from Hilton to the canoe trip and back

INFORMATION FOR PRESENTERS

Copies: If you plan to hand out paper copies during your presentation, you are responsible for copying and providing them at the Conference. There are NO Conference sponsored copy machines for your use at Monona Terrace. You are welcome to pay Monona Terrace directly if you have their



administrative office make copies for you.

Session Rooms: All session rooms will be equipped with a PC loaded with Windows XP, PowerPoint 2007, an LCD video projector, Internet connection, audio for the computer, a projection screen, wireless lavalier microphone, wireless mouse and slide advancer, a laser pointer, podium and a microphone. If you need assistance during a presentation, use the house phone located in the session to call the Audio Visual Technicians at the Monona Terrace to assist you.

SESSION CHAIR MEETING AND AUDIO VISUAL TRAINING

Tuesday, June 11

7:30 – 8:00

➔ **Hall of Ideas G**

If you have volunteered to moderate a session, or are a chairperson of a session, please attend a short training to learn about your responsibility and how to troubleshoot the audio visual equipment. You will be running the sessions so understanding the equipment will help ease your mind.

CONFERENCE MEALS AND RECEPTIONS

The conference will be providing a continental breakfast service each morning in the Grand Terrace featuring coffee, juices and pastries. Morning and afternoon beverage service will be available during the session breaks, and a buffet lunch will be served at 12 noon. Monday and Thursday nights will feature a reception showcasing some local Wisconsin fare. And an elegant banquet on the Monona Terrace rooftop will tantalize and entertain you with the best view in Madison, WI. See your conference Schedule-at-a Glance for specific times. Water cups are provided near coolers located in the Grand Terrace, at all meal functions, and in the conference hallways.

WALKING TIMES BETWEEN MONONA TERRACE AND CONFERENCE HOTELS

Hilton: 3 minutes and is attached to the Monona Terrace via a sky walk.

Best Western Inn on the Park: 5 minutes and is located on the capital square.

Lowell Center Inn: 20 - 25 minutes and is a lovely walk down State Street and located on the other Lake, "Lake Mendota."

LUGGAGE STORAGE ON DEPARTURE DAY

Attendees who check out of their hotel rooms in the morning may store luggage at the Conference Registration and Information Desk until departure to the Dane County Airport at 12:30.

CONFERENCE MESSAGE BOARD

The Conference Message Board is located near the Conference Registration and Information Desk on Level 4. Feel free to post job vacancies, messages for colleagues, announcements, or other items of interest.

MONONA TERRACE DISABILITY ACCESS

The Monona Terrace is fully wheelchair accessible.

CONFERENCE ATTIRE

Business casual attire is suggested for the Conference. We recommend bringing a sweater or jacket to the Monona Terrace, which is kept quite cool. Madison is a walking city, so we highly recommend bringing comfortable walking shoes, layers and an umbrella. The night of the banquet on the rooftop, depending on the weather, can become chilly after the sun sets. Bring a jacket or a sweater for your comfort.

PHOTOGRAPHY DISCLOSURE

Portions of this event may be videotaped and photographed by the Conference and/or the media. By attending this Conference, you accept the possibility that you may be videotaped or photographed.

DAILY PUBLIC TOURS OF MONONA TERRACE

Monona Terrace tour guides discuss how Frank Lloyd Wright's organic architecture is expressed in dramatic open spaces, circular forms and breathtaking lake views. Tours take one hour and are offered daily at 13:00. Admission is \$3 per adult and \$2 per student. Tickets may be purchased in the gift shop.

FOOD FOR PURCHASE AT MONONA TERRACE

If you are still hungry after feasting on the conference sponsored meals and want to grab a bite to eat while at Monona Terrace, there are two options. The Monona Terrace Lake Vista Café is an outdoor venue in the William T. Evjue Rooftop Garden and features a menu ranging from simple fare to casual gourmet, full beverage service and beautiful views of Lake Monona from its shore. It is on the rooftop, Level 6, and is open Mondays from 11:00 – 15:00 and Tuesdays through Sundays from 11:00 to 20:00, weather permitting. The Grand View Café on the west side of the Grand Terrace, Level 4, is open when the Lake Vista Café is closed due to inclement weather, and has varying hours otherwise. Coffee, pastries and snacks are available for purchase. There are soda vending machines located near the Monona Terrace gift shop.

MONONA TERRACE WIRELESS ACCESS

All visitors have access to the Monona Terrace wireless network with 99.99% reliability. A 40k connection is available free of charge, and a 768k connection may be purchased via Visa, MasterCard, American Express or Discover. Rates for the 768k connection are \$10.00 per day, per person.

If you have a laptop, Pocket PC, or other device with 802.11 a, b or g wireless capability, you can log onto the Monona Terrace Community and Convention Center Wireless Network. A screen will appear and prompt you to select the connection speed you desire.

How to Log On

Connect to "monona-guest" network.



Open your Internet browser and you will be automatically redirected to our login page. Select free service or purchase the high speed service.

Troubleshooting:

If the Monona Terrace login page is not displayed, ensure your wireless connection is enabled and follow the instructions below for your operating system.

Windows: Click the Wireless Network icon in the lower right corner of your screen. The Wireless Network Connection window should appear, ensure you are connected to the monona-guest wireless network. If not, click on monona-guest and then select Connect.

Mac OS X: Click on AirPort in the upper right area of the screen, and select the monona-guest network. When connected, the AirPort menu will turn from gray to black.

Reopen your Internet browser and choose the preferred service.

Wireless Support

Still having trouble? Free IT support is available. Inquire with the Greeter at the Welcome Desk located across from Ballrooms AB, just inside the main entrance of Monona Terrace.

MONONA TERRACE IS A GREEN FACILITY

Monona Terrace has a silver level certification under the U.S. Green Building rating system (LEED - EB). LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy and atmosphere, materials and resources and indoor environmental quality.

SMOKING POLICY

Smoking is not allowed inside the Monona Terrace or on the Monona Terrace rooftop. Designated outdoor smoking areas are located near the Olin Terrace Entrance on Level 5 and outside the Lakeside Commons Exit on Level 1. Wisconsin law prohibits smoking in all public buildings, restaurants, bars, park shelters, sports venues and common areas of hotels. If you wish to smoke in your hotel room, you must request a smoking room when making your reservation.

LOST AND FOUND

Items found during the Conference may be turned in at the Registration and Information Desk, Level 4. You may retrieve lost items from one of the following three places: the Conference Registration and Information Desk, Level 4; the Monona Terrace Greeters Desk at the front doors, Level 4; or the Monona Terrace Administrative Offices, west end of Level 3. Any lost and found items left after the conference will be left at the Monona Terrace.

EMERGENCIES

For local Fire, Police and Rescue/Ambulance call 9-1-1

If emergency services are needed within the Monona Terrace, please dial 0 on any Monona Terrace

phone and an operator will assist you.

LOCAL TAXI SERVICES

Badger Cab 608-256-5566
Union Cab 608-242-2000
Madison Taxi 608-255-8294

PHARMACIES

Community Pharmacy
341 State Street (entrance on Gorham Street just around the corner from State Street)
Community Pharmacy sells conventional and alternative health products and provides full prescription services. Locally owned and operated.
Prescription line 608-251-4454
Non-prescription line 608-251-3242
Walgreens, Capital Square
15 East Main Street 608-257-3814

LOCAL IMMEDIATE CARE NON-EMERGENCY CLINICS

Group Health Capitol Clinic Urgent Care
675 West Washington Avenue 608-257-9700
(at Regent Street)
Dean Urgent Care
752 North High Point Road 608-250-1525
1821 South Stoughton Road 608-250-1525
UW Health Immediate Care
7102 Mineral Point Road 608-828-7603
4122 East Towne Boulevard 608-242-6855

LOCAL HOSPITALS

Meriter Hospital
202 South Park Street
General 608-417-6000
24 Hour Emergency 608-417-6206
St. Mary's Hospital Medical Center
700 South Mills Street
General 608-251-6100
24 Hour Emergency 608-258-6800

UW Hospital and Clinics
600 Highland Avenue

Terrace Rooftop view of the Capital





St. Mary's Hospital Medical Center
700 South Mills Street
General 608-251-6100
24 Hour Emergency 608-258-6800

UW Hospital and Clinics
600 Highland Avenue
General 608-263-6400
24 Hour Emergency 608-262-2398

AUTOMATED TELLER MACHINES (ATMs)

There are several banks along the Capitol Square with accessible ATM's, as well as one on Level 4 of Monona Terrace near the west end vending machines.

CURRENCY EXCHANGE

U.S. Bank
1 South Pinckney Street 608-252-4000
(on the Capitol Square)
Chase Bank
22 East Mifflin Street 608-282-6020
(on the Capitol Square)

CHECK CASHING FOR INTERNATIONAL VISITORS

Checks drawn on U.S. banks may only be cashed at the bank (or a branch of the bank) on which the check was drawn. You will need your passport for identification.

UNITED STATES POST OFFICE

215 Martin Luther King Jr. Drive 608-250-6479
(across street from Monona Terrace, Level 5)
Monday - Friday 8:00 – 17:00

PARKING

The Monona Terrace has a 400-space, cashier-operated parking structure which is accessible by East Wilson Street or the eastbound lanes of John Nolen Drive. The ramp is ticketed. Pay cashier upon exit. The Hilton Hotel also operates a parking ramp accessible at the East Wilson Street exit. Guests of the hotel pay \$13 per night.

The City of Madison has a ticketed ramp across the street from the Monona Terrace at the corner of Pinckney Street and Wilson Street. Pay cashier upon exit.

DISABLED PARKING

Disabled parking stalls are available at no cost for Monona Terrace event parking on the upper drive-through/drop-off level near the parking meter areas on both sides of Monona Terrace. Disabled parking stalls are also available for a charge on the lower ramp Level in front of the Level 3 Entrance doors. Curb cuts are located in close proximity to accessible parking and make travel to the building convenient.

BICYCLE RENTALS

Trail maps are available at all local bicycle shops.

Madison B-Cycle is an urban bike sharing program with over 35 active stations throughout the Madison area. If you are interested in renting a B-cycle, visit their website for station locations and information at <http://madison.bcycle.com>.

For additional information about cycling in Madison, visit www.cityofmadison.com/bikeMadison. Machinery Row Bicycles rents bicycles and gear and is just one short block east of the Monona Terrace along the Lakeshore Path.

(Access lake path from Monona Terrace, Level 1) For details call 608-442-5974 or visit www.machinery-rowbicycles.com/index.php/rentals.

BOAT RENTALS (canoes, kayaks, paddleboards, windsurfers, rowboats...)

Memorial Union Boathouse
www.union.wisc.edu/outdoorrentals.htm
800 Langdon Street 608-262-7351

Wingra Boats
www.wingraboats.com
824 Knickerbocker Street 608-233-5332
Wingra Boats/Brittingham Park Location
401 South Brittingham Place

LAKE CRUISES

Betty Lou Cruises 608-246-3138
Private group charters and public dinner/cocktail cruises

EXERCISE, SPORT, AND RECREATIONAL FACILITIES

Check with your hotel concierge for fitness amenities within your hotel.

Capital Fitness, located about six blocks from the Monona Terrace at 15 North Butler Street, has cardio and weight training machines and offers classes throughout the day. Guest passes cost \$15. Capital Fitness is open Monday through Friday from 5:00 to 21:00 and on Saturday and Sunday from 7:00 to 21:00.

GENERAL INFORMATION, cont.



The University of Wisconsin-Madison campus welcomes Conference visitors to use its recreational facilities. To use the facilities you will need to show your Conference name tag, be 18 years of age, and pay a guest fee of \$5.00. See the following website for details: <http://recsports.wisc.edu/memberservices-guestaudit-guestpasses.html>

Two facilities are available:

The UW Southeast Recreational Facility (SERF) is located at 715 West Dayton Street, 608-262-8244, and includes a three lane 1/10 mile indoor track, 4 gymnasiums, 10 racquetball courts (courts 1 and 2 are wheelchair accessible), 63 meter pool, weight room, cardio center, fitness training room, group fitness studio and group cycle/ spinning class room.

The UW Natatorium at 2000 Observatory Drive, 608-262-3742, features a 25 yard 8 lane pool with diving well, 4 gymnasiums, 5 racquetball courts, weight room, cardio center, fitness training room, group cycle room and a Parcourse Fitness Circuit.

LOCAL EVENT LISTINGS

www.visitmadison.com

www.thedailypage.com/theguide/



Conductor James Smith and the University Symphony Orchestra

COMMITTEES



MSEC 2013 / NAMRC 41 Organizing Committee

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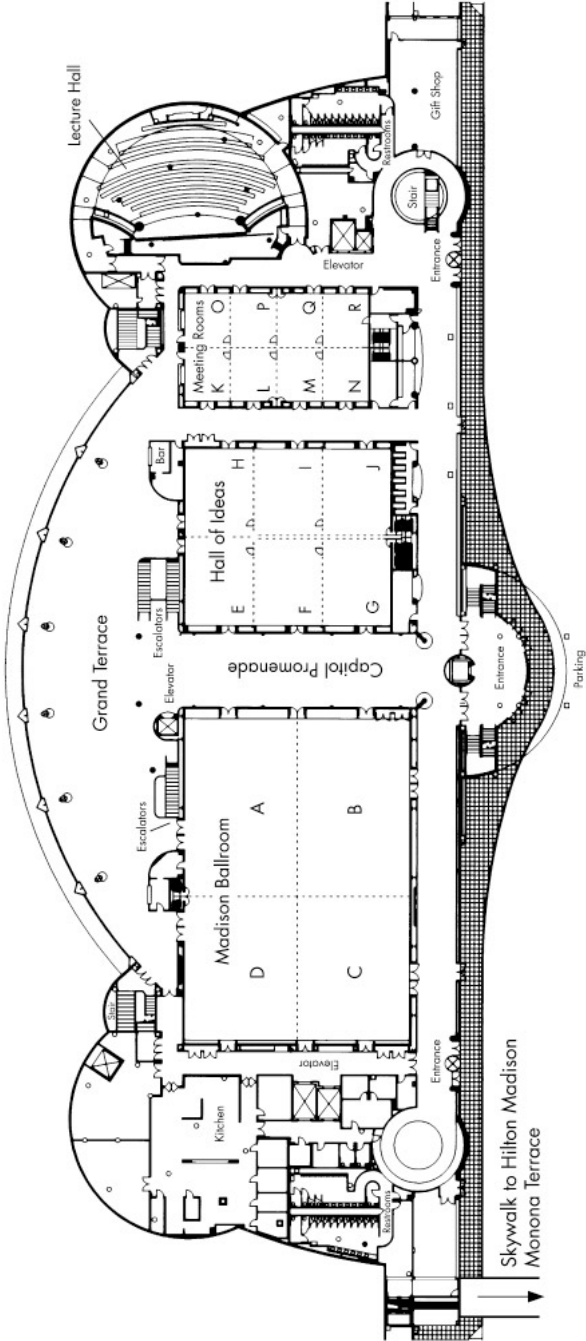
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LEVEL 4 - MEETING ROOMS / GRAND TERRACE



2014 MSEC* / NAMRC / ICM&P

June 9 – 13, 2014 in Detroit, Michigan USA



Conference Hotel –
Detroit Marriott at the Renaissance Center



Conference Venue –
Cobo Center on the Detroit Riverfront



Award Dinner – Jack Roth Stadium Club
at Michigan Stadium ("the Big House")

The University of Michigan--Ann Arbor is pleased to invite you to attend the **2014 International Manufacturing Research Conference**, combining three organizations:

- **American Society of Mechanical Engineers (ASME) International Manufacturing Science and Engineering Conference (MSEC 2014)*;**
- **42nd North American Manufacturing Research Conference (NAMRC 42)**, sponsored by the **North American Manufacturing Research Institution of the Society of Manufacturing Engineers (NAMRI/SME)**; and
- **Japan Society of Mechanical Engineers (JSME) International Conference on Materials and Processing (ICM&P 2014)**, sponsored by the **JSME and ASME**

MSEC is the foremost annual forum sponsored by the Manufacturing Engineering Division (MED) of ASME International. It is intended to disseminate the most recent manufacturing research and development through both technical presentations and panel sessions.

NAMRC is the premier international forum for applied research and industrial applications in manufacturing and design, sponsored by NAMRI/SME. Global academicians, government and industry researchers, engineers, and leaders in manufacturing attend this conference to interact with each other and advance the field.

ICM&P is the key conference of the Materials and Processing Division (M&P) of JSME. The conference highlights cutting-edge manufacturing research in technical paper, poster, and panel sessions.

The conference schedule will include keynote and technical presentations; expert panels; student poster presentations; an exhibition of industry partners; an early career forum; University of Michigan lab tours; industry tours; an awards banquet; luncheons; and more. These co-located conferences will be held at the Cobo Center, located on Detroit's revitalized riverfront, in conjunction with the SME BigM event and exhibition.

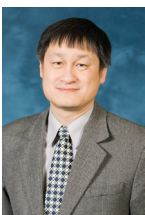
Michigan and its adjacent regions are the manufacturing centers of North America. Detroit Wayne County Metro Airport (DTW) is 21 miles (34 km) from the convention center and hotels.

The 11th Wu Symposium, US Venue, will be held on June 13-14, 2014 at Ann Arbor, Michigan.

Visit <http://namrc-msec-icmp-2014.engin.umich.edu> for updated information.



* Pending approval by ASME Events Committee



Professor Albert Shih,
2014 Conference Host