The North American Manufacturing Research Institution of the Society of Manufacturing Engineers invites you to attend the

Thirty-Sixth North American Manufacturing Research Conference

NAMRC 36

An International Forum

May 20-23, 2008

Monterrey, MEXICO

Hosted by
Tecnológico de Monterrey
Department of Mechanical Engineering
Center for Innovation in Design and Technology

http://cidyt.mty.itesm.mx/namrc

Society of Manufacturing Engineers

NAMRI SME

North American Manufacturing Research Institution of the Society of Manufacturing Engineers

Dear Friends and Colleagues:

We are pleased to invite you to the Tecnológico de Monterrey for the 36th Annual North American Manufacturing Research Conference! NAMRC is the premier international forum for academic research and industrial applications in manufacturing. Global academic and industrial leaders in manufacturing attend this conference to interact with each other and advance the field.

In 2008, the long tradition and manufacturing research excellence of NAMRC will be held in Mexico for the first time. We have planned an event with rich interactions among research groups and industry in order to learn about the state of the art in manufacturing research and discuss the future challenges of global manufacturing.

The Monterrey area is one of the most important manufacturing regions in Mexico, with world-class companies in industrial sectors such as automotive, heavy machinery, home appliances and aerospace. A series of workshops, industry panels and industry tours are planned for NAMRC 36 in Monterrey, providing a unique opportunity to learn how clusters of companies from the Americas, Europe and Asia interact in order to realize collaborative product development and global manufacturing.

Guests to NAMRC 36 will also experience the friendship and culture of Mexico through the social program and the strategic location of the event's official hotel in downtown Monterrey. NAMRC 36 will be an exciting event advancing the cutting edge of manufacturing research and providing an atmosphere that promotes international collaboration.

We look forward to seeing you in Monterrey!

Regards,

J Eugenio García
NAMRC 36 Conference Co-Chair
Tecnológico de Monterrey
Monterrey, MEXICO

Mario Martínez
NAMRC 36 Conference Co-Chair
Tecnológico de Monterrey
Monterrey, MEXICO

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NAMRC 36 Conference Co-Chair
Tecnológico de Monterrey
Monterrey, MEXICO

Ciro A. Rodríguez
NAMRC 36 Conference Co-Chair
Tecnológico de Monterrey
Monterrey, MEXICO

What is NAMRC—An International Forum

NAMRC is an international forum for the presentation and critical discussion of the results of basic and applied research in material forming, material removal, and manufacturing systems and controls. It is one of only a few events of its kind where technical innovations, new methods and applications of leading-edge technology from throughout the world are shared among manufacturing research, design, engineering and production professionals from academia and industry. Because NAMRC takes place every year, the findings and breakthroughs presented here are topical and of current interest.

Why Should You Attend?

By attending NAMRC 36 you will:

- gain insight on the most recent developments in material removal and forming processes, automation and control of processes and systems, equipment accuracy and precision and many other manufacturing-related topics,
- participate in a dialogue between industry and academia on future needs for manufacturing processes and applications,
- enhance your knowledge of alternative manufacturing processes and applications,
- make valuable contacts with other leading manufacturing researchers and professionals.

About NAMRI/SME

The North American Manufacturing Research Institution of the Society of Manufacturing Engineers (NAMRI/SME) is an organization dedicated to manufacturing research and technology development. Its mission is to advance manufacturing engineering by promoting research and its application in industry. To learn more about NAMRI/SME or to become a member, visit the Web site at ***www.sme.org/namri***.

Sponsorship

The NAMRC 36 Organizing Committee thanks our sponsors: the Department of Mechanical Engineering, the Center for Innovation in Design and Technology and the members of the Association for Manufacturing Technology.

Conference Publication

Papers accepted for and presented at NAMRC 36 are contained in the hardbound *Transactions of NAMRI/SME*, Volume 36, 2008. Participants who have paid the registration fee will receive a copy at the time of registration along with a CD of the papers. Additional copies and past volumes (as available) of the *Transactions* may be purchased by contacting an SME Customer Service Representative at (313) 425-3000, ext. 4500 or (800) 733-4763.

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Conference Site & Facilities

Founded in 1943, the Tecnológico de Monterrey has expanded into a 90,000 student, multi-campus university system with activities all over Mexico and Latin America. Its main campus in Monterrey, with more than 17,000 undergraduate and graduate students, has the privilege of hosting NAMRC 36.

Founded by industrialists, the Tecnológico de Monterrey has a long-standing tradition for close collaboration with local and national industry. Most of such university-industry relationships that happen within the School of Engineering take shape through graduate student thesis research, consulting projects and continuing education. It is this interaction with industry that makes NAMRC 36 in Monterrey a particularly interesting event.

The School of Engineering, with eight research center and more than 15 institutional research chairs in disciplines ranging from medical devices to automation, is positioned as a leading development group in Mexico. Topics related to manufacturing processes, mechanical design and engineering materials are mostly housed in the Center for Innovation in Design and Technology (CIDyT) and the Department of Mechanical Engineering. Current industrial collaboration at the CIDyT and the Department of Mechanical Engineering includes projects such as airplane maintenance and overhauling (Aeroméxico, Mexico); wind generator manufacturing and maintenance (Gamesa Eólica, Spain); automotive structural design (Magna Powertrain, Canada); home appliance design and manufacturing (Whirlpool, USA); boiler design and manufacturing (Cerrey, Mexico); new materials for electrical transformers (Prolec GE, Mexico-USA); steel production (Ternium, Argentina); new generation batteries (Johnson Controls, USA) and collaborative engineering (General Motors, USA).

The School of Engineering grants 18 undergraduate degrees, 16 master's degrees and two doctoral degrees. All of its undergraduate programs are ABET accredited and those at the graduate level have been certified by the National Council for Science and Technology (CONACyT).

Special Activities

In connection with NAMRC 36:

- NAMRI/SME Board Meeting, Tuesday, May 20, from 8:30 a.m. to 3:30 p.m. at the CETEC North 8th Floor
- Welcoming Reception and Registration on Tuesday, May 20, from 6:00 to 8:00 p.m. at the Howard Johnson Hotel (main conference hotel)
- Lab tours and manufacturing technology demonstrations on Wednesday, May 21, from 4:00 to 6:00 p.m.
- Welcoming Ceremony and Keynote Address on Wednesday, May 21, from 8:30 to 10 a.m. at the Student Center in the Tecnológico de Monterrey Campus
- NAMRI/SME Awards Luncheon on Wednesday, May 21, from Noon to 1:45 p.m. in the Student Center Executive Room
- NAMRC Banquet on Wednesday, May 21, from 6:00 to 10:00 p.m. in the Student Center
- Founder's Lecture by Stephen Malkin, Distinguished Professor, University of Massachusetts, on Thursday, May 22, from Noon to 1:45 p.m. in the Student Center Executive Room
- NAMRI/SME membership meeting on Thursday, May 22, from 3:30 to 4:30 p.m. in the Student Center
- ASME/MED membership meeting on Thursday, May 22, from 4:30 to 5:30 p.m. in the Student Center
- Industry panel, "Regional Perspective on Global Engineering and Manufacturing," on Thursday, May 22, from 5:45 to 7:15 p.m. in the Student Center
- Industry tour at NEMAK on Friday, May 23, from 1:00 to 6:00 p.m., meet in the Student Center
- SANDVIK workshop on Friday, May 23, from 1:00 to 6:00 p.m., meet in the Student Center
- AMADA workshop on Friday, May 23, from 1:00 to 6:00 p.m., meet in the Student Center
- Companion program, including tour of the city, visit to the small town of Santiago and the *Cola de Caballo* waterfalls

Student Research Presentation Contest

NAMRC 36 will host the third Student Research Presentation Contest to recognize contributions to NAMRC and to encourage students to pursue a career in manufacturing research, which is of vital importance to the long-term goals of the manufacturing community. The contest is based on the student's oral presentation of a paper that he or she coauthors. The student presentations will be part of regular technical sessions and have the same time limitation. The presentations will be judged by a panel comprised of NAMRI/SME Honors Committee members or their delegates. The judges will not judge their own students. The judgment will be primarily based on clarity of presentation, including oral expression and use of visual aids. Originality and scientific merit of material presented may also be taken into account. First, second and third-place winners will be announced at the NAMRI/SME General Membership Meeting on Thursday, May 22, 2008.

Laboratory Tours and Manufacturing Technology Demonstrations

Wednesday, May 21, 2008, 4:00–6:00 p.m.

NAMRC 36 will provide tours of the following research laboratories as well as other manufacturing-related facilities located on campus. You may also want to take a tour of the Tecnológico de Monterrey campus on your own. Maps of the campus will be provided in your registration packet.

AMT Center México

AMT-The Association For Manufacturing Technology represents established U.S. companies that produce advanced manufacturing technology, companies that manufacture machinery, related equipment, and products or software used in the process of manufacturing discrete durable goods. The AMT Center México is located at Tecnológico de Monterrey and has the following objectives: (a) establish a bridge to facilitate contacts between Mexican industrials and more than 420 manufacturing technology producers from the U.S.; (b) communicate new trends in U.S. manufacturing technology; (c) introduce sources of technology that increase flexibility; (d) support local distribution to benefit regional industry and (e) maintain U.S. members' awareness of any particular need in the Mexican industry on manufacturing technology. The following manufacturing technologies are on demonstration at the AMT Tech Center México: Flow, Amada, Makino, Southwestern Industries, ElectroArc, Toyoda, Hardinge, Vektek, Sandvik, Kurt, KOMET, Command, OGP, Motoman, Okuma and Sescoi. http://www.amtcenter.org.mx/

Center for Innovation in Design and Technology

The Center for Innovation in Design and Technology (CIDyT) is focused on applied research, consulting and entrepreneurship activities related to product engineering and innovation, intelligent manufacturing processes and manufacturing systems. The research groups associated with this center include: intelligent machines, automotive engineering, nanotechnology, nanomaterials, medical devices, wind energy and product creativity and innovation.

Center for Biotechnology

The Center for Biotechnology is focused on applied research, consulting and entrepreneurship activities related to food and pharmaceutical biotechnology. The research groups associated with this center include: food biotechnology, pharmaceutical biotechnology and bioengineering.

Industry Tour and Workshops

Friday, May 23, 2008, 1:00–6:00 p.m.

Industry Tour at NEMAK. Since the beginning of operations in 1981, Nemak has specialized in the production of aluminum cylinder heads, engine blocks and other aluminum components for automotive applications. Nemak has experienced a steady growth rate, becoming a leading company in the automotive industry. Nemak has 28 manufacturing facilities located in 13 different countries in North America, South America, Europe and Asia and close to 15,000 employees. The Nemak plant in Monterrey features semi-permanent mold casting, low-pressure casting, automated sand mold assembly, transfer-line machining and flexible cell machining.
http://www.nemak.com/

SANDVIK Workshop. The SANDVIK workshop will focus on cutting tool selection for various industrial sectors and machining cost evaluation. Live demonstrations will be conducted on high-speed milling machines for illustration of theoretical concepts.

AMADA Workshop. The AMADA workshop will cover the basics of laser cutting and applications. Live demonstrations will be conducted on a laser cutting machine for illustration of theoretical concepts.

Companion Program

A variety of activities are being planned and the participants will be consulted for the activities to best suit their interests. The plan will be modified per the interests of the companion program participants. The tentative plan is as follows:

Macroplaza and Museum of Mexican History (Day 1)

The Macroplaza is one of the largest squares in the world and is the social and cultural heart of Monterrey. Learn about the city, from its beginnings and founding to the present time through the monuments and buildings characteristic of the different times. We continue our tour including a visit to the Museum of Mexican History, which offers a route by the most representative times of national history. Transportation and English-speaking guide will be provided.

Cola de Caballo and Villa de Santiago (Day 2)

Just a short distance up in the hills from the town of Santiago are the beautiful *Cola de Caballo* (Horse Tail) waterfalls. In the small town of Santiago, you can admire the work of skilled craftsmen and take a walk in the outdoors. Transportation and English-speaking guide will be provided.

Registration Fees

To register by fax, print off a copy of the paper registration form and return a completed copy to our office. Faxed registrations must include credit card number, security code and signature; keep your original if you register by fax. Payment must accompany registration. Payments are accepted via VISA, Amex, MasterCard, check, money order or purchase orders. Make checks/money orders payable to *ITESM* and send them via DHL or UPS to: *NAMRC-Centro de Innovación en Diseño y Tecnología, Tecnológico de Monterrey, Ave. Eugenio Garza Sada #2501 Sur, Monterrey, MEXICO 64849. Phone: 011 52 (81) 8328-4002*

All fees are in U.S. dollars. Companion Program participants should complete their own registration form. Make additional copies of the form as needed.

All fees except the companion registration include entrance to all technical sessions, all conference materials, publications, meal functions and laboratory tours. Included in the companion registration fees are conference breakfasts, banquet and two receptions; and companion program tour (see Companion Program for details). Industry tour is charged separately to cover transportation costs. *There are no single-day registration fees.* There are no reduced registration fees for authors or session chairs. Student attendees do not receive the *Transactions of NAMRI/SME*.

Cancellation and Refunds

Refunds, less an administrative fee of US $100, will be issued for all cancellations received in writing before May 12, 2008. No refunds will be made after that date, but a substitution of attendees may be made by notifying Conference Services prior to the conference. Please allow six to eight weeks to receive check refunds. Credit card refunds will be issued to the credit card that made the payment. Those who register but fail to cancel by the deadline and do not attend the conference will not be eligible for a refund. Should this event cancel in entirety, the Tecnológico de Monterrey's liability is limited to a refund of the registration fees paid.

Travel and Accommodation Information

All international participants are responsible for their own visa and health insurance needs.

Howard Johnson Macroplaza Monterrey (main conference hotel)
574 Morelos Ote, Col. Centro
C.P. 64000 Monterrey, N.L, México
Toll Free 1 800.432.9605 / 1 800.446.4656
Phone +52 (81) 8380-6000
http://www.hojomonterrey.com.mx/
NAMRC 36 room rate (Single/Double): $80 (reservation prior to April 20, 2008)

Holiday Inn Express Tecnológico
Av. Eugenio Garza Sada #3680 Sur, Col. Villa Los Pinos
C.P. 64310 Monterrey N.L. México
Phone +52 (81) 8329-6000, Fax +52(81) 8329-6020
http://www.hotelesmilenium.com/eng/hoteles/monterrey/hietec/mgh.html
NAMRC 36 room rate (Single/Double): $95 USD
(reservation prior to April 20, 2008)

Holiday Inn Parque Fundidora
Retorno Fundidora No. 100, Col. Obrera
C.P. 64010 Monterrey N.L. México
Phone +52 (81) 8369-6000 Fax: +52 (81) 8369-6048
http://www.hotelesmilenium.com/eng/hoteles/monterrey/hipf/mgh.html
NAMRC 36 room rate (Single/Double): $95 USD
(reservation prior to April 20, 2008)

Visit the NAMRC 36 Web site at *http://cidyt.mty.itesm.mx/namrc* for more information about:
Dining near conference hotels
Monterrey attractions

Explore Monterrey

Diego de Montemayor founded *Ciudad Metropolitana de Nuestra Señora de Monterrey* (Metropolitan City of Our Lady of Monterrey) on September 20, 1596, next to a spring called *Ojos de Agua de Santa Lucia*, where the Museum of Mexican History is now located. Today, Monterrey is Mexico's third-largest city with a population of more than three million in the metropolitan area. Besides being a powerhouse of business and industry, Monterrey offers a rich array of cultural and leisure opportunities. The city also excels in higher education, with more than 130,000 students in several universities. More on Monterrey history and cultural life at *http://en.wikipedia.org/wiki/Monterrey*

Directions to Campus

By Air

The best way to arrive to Monterrey is by air (General Mariano Escobedo International Airport, code MTY). All of the major U.S. airlines fly to Monterrey on a regular basis from Dallas, Houston, Atlanta and Chicago. From Europe and Asia, there are plenty of flight options through Mexico City or through U.S. airports.

Cab/Taxi

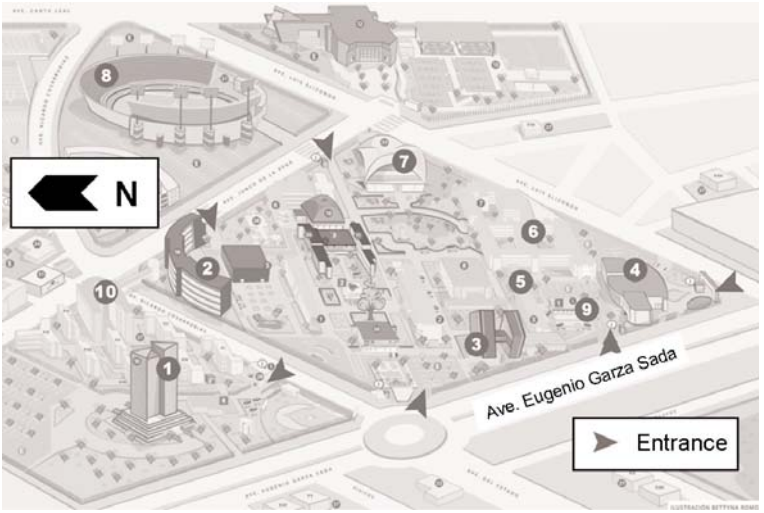
There are official taxi and shuttle services from the airport to any part of Monterrey. The taxi or shuttle service can be purchased at the dedicated module. The usual fare for airport to downtown transportation is approximately $25 USD.

Hotel to Campus Transportation

There will be a regular shuttle trips from hotel to the Tecnológico de Monterrey Campus from the Howard Johnson hotel located in downtown. For those not staying at the conference hotel, the recommended means of transportation is city taxis (green and white taxis).

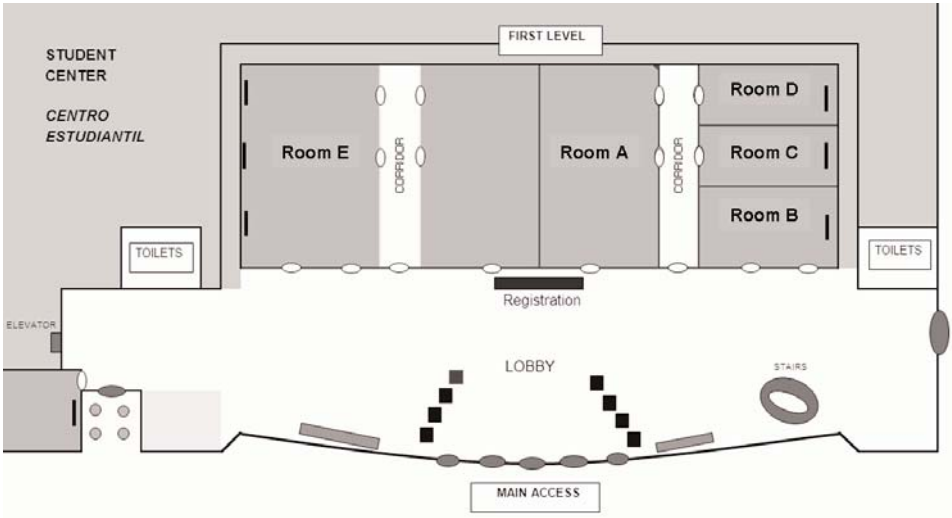
Tecnológico de Monterrey Campus Map

Selected Buildings



1. CEDES
2. CIAP
3. CETEC
4. Student Center (SC)
5. Aulas III
6. Aulas IV
7. Gym
8. Stadium
9. Banks

Student Center Layout



Climate

The average high temperature in May is 90 degrees Fahrenheit. The average low is 68 degrees Fahrenheit. Please check the weather forecast for the area before leaving for your visit.

How to Register – Online or Fax

Online registration at: http://cidyt.mty.itesm.mx/namrc
For fax, complete the registration form at the back of the program brochure.
If faxing, please fax with your payment information to:

Tecnológico de Monterrey
Fax: 011 52 (81) 8358-1209

For information regarding the conference registration process, please contact Tecnológico de Monterrey at tel. **011 52 (81) 8328-4002** or at Email: **namrc.mty@servicios.itesm.mx**

NAMRC 36
Technical Sessions and Programs

TUESDAY, MAY 20, 2008

8:30 a.m. – 3:30 p.m.
NAMRI/SME Board Meeting
CETEC North – 8th Floor

3:45 p.m.
Transportation to Howard Johnson Hotel

6:30 p.m. – 8:30 p.m.
Conference Registration and Welcoming Reception
Howard Johnson Hotel - Ballroom

WEDNESDAY, MAY 21, 2008

7:15 a.m. – 8:00 a.m.
Registration and Breakfast
Student Center – Lobby

8:15 a.m. – 10:00 a.m.
Welcoming Ceremony
Student Center – Room A
Speaker: Manuel Rivera, CEO, Nemak

10:00 a.m. – 10:30 a.m.
Morning Coffee Break
Student Center – Lobby

10:30 a.m. – Noon
Concurrent Technical Sessions

* Student author presenting the paper as part of the Student Research Presentation Contest

Session A1-1: Machinability
SC-Room C
Co-chairs: Antonio Vallejo, Tecnológico de Monterrey
Reyes Toledo, Sisamex

Chip Breaking in Turning Operations Using CNC Toolpaths
B.A. Woody, K.S. Smith, D.J. Adams*, and B.E. Barkman

Characteristics of 3D Chip Morphology and Properties in End Milling Ti-6Al-4V
J. Sun and Y.B. Guo

Comparing Drilling and Circular Milling for Hole Making in Bi-Layer Composite Materials Consisting of Carbon Fiber Reinforced Plastic (CFRP) Laminates and Titanium Alloys
H. Yagishita

Session B1-1: Polymer Processing

SC-Room B
Co-chairs: Jaime Bonilla, Tecnológico de Monterrey
Mauricio Cabrera, Universidad Autónoma de Nuevo León

Laser Surface Treatment of a Biodegradable Polymer at Varying Fluences
A. Bhatla and Y.L. Yao

Robust Spin-Coating of Thin PDMS Films
S. Krishnan and S. Sarma

Development of a Multi-Piece Multi-Gate Mold for Manufacturing a Flapping Wing Drive-Mechanism
A. Ananthanarayanan*, W. Bejgerowski, D. Mueller, and S.K. Gupta

Session C1-1: Micro/Nanotechnology in Forming Processes

SC-Room C
Co-chairs: Nicolás Hendrichs, Tecnológico de Monterrey
Jorge Cortés, Tecnológico de Monterrey

A Study on Forming Micro Aluminum Pins by Using a Micro Forward-Backward Extrusion Die
C-H. Chen, J-T. Gau, M. Yu, and Z-Y. Yang

Discrete Element Modeling of Micro-Feature Hot Compaction Process
P. Chen and J. Ni

Experimental Investigation of Microbending Process
R.M. Onyancha and B.L. Kinsey

OVERVIEW OF TECHNICAL SESSION TRACKS AND SCHEDULE

	Student Center Room A	Student Center Room B	Student Center Room C	Student Center Room D
Wednesday May 21				
10:30–12:00	Session A1-1: Machinability	Session B1-1: Polymer Processing	Session C1-1: Micro/Nanotechnology in Forming Processes	Session D1-1: Sensors and Process Monitoring 1
2:00–3:30	Session A1-2: Rapid Prototyping	Session B1-2: Metrology	Session C1-2: Micro/Nanotechnology in Non-conventional Machining and Assembly	Session D1-2: Sensors and Process Monitoring 2
Thursday May 22				
8:00–10:00	Session A2-1: Micro/Nanotechnology in Machining Processes 1	Session B2-1: Metal Forming Processes	Session C2-1: Dynamic Stability in Machining Processes	Session D2-1: Process Planning and CAM/CNC
10:30–12:00	Session A2-2: Micro/Nanotechnology in Machining Processes 2	Session B2-2: Machine Tools	Session C2-2: Green Manufacturing	Session D2-2: Abrasive Machining Processes
2:00–3:30	Session A2-3: Micro/Nanotechnology in Machining Processes 3	Session B2-3: Novel Forming Processes	Session C2-3: Machining Modeling and Simulation	—
Friday May 23				
8:30–10:00	—	Session B3-1: Surface Finish and Integrity	Session C3-1: Manufacturing Systems	Session D3-1: Assembly Systems and Fixturing 1
10:30–12:00	—	Session B3-2: Non-conventional Machining Processes	Session C3-2: Tool Wear	Session D3-2: Assembly Systems and Fixturing 2

Session D1-1: Sensors and ProcessMonitoring 1
SC-Room D
Co-chairs: Federico Guedea, Tecnológico de Monterrey
David Villasenor, Forney Corp.

Cutting Temperature Measurements of Segmented Chips Using Dual-Spectrum High-Speed Microvideography
J.C. Heigel, R.W. Ivester, and E.P. Whitenton

Workpiece Defect Detection Using Piezoelectric-Instrumented Fixtures for Machining of Metal Matrix Composites
J.T. Dreyer, S.M. Pandit, J.L. Rickli, J.A. Camelio, J.E. Loukus, and A.R. Loukus

Evaluation of Cylinder Bore Inspection System
J.S. Agapiou and S. Segall

Noon – 1:45 p.m.
NAMRI/SME Awards Luncheon
Executive Room (2nd Floor)

2:00 p.m. – 3:30 p.m.
Concurrent Technical Sessions

Session A1-2: Rapid Prototyping
SC-Room A
Co-chairs: Pedro Orta, Tecnológico de Monterrey
Raúl Hernández, Whirlpool

Tri-Dexel Volumetric Modeling for Haptic Sculpting and Virtual Prototyping of Complex Surfaces
Y. Ren, W. Zhu, and Y-S. Lee

Progress Toward a Denser Metal Matrix Composite Using the Three Dimensional Printing Method
L. Sun, P. Kwon, D-W. Kim, and K. Beavers

Analysis of Process Variable Effects on the Roller Imprinting Process
A. Vijayaraghavan*, S. Hayse-Gregson, R. Valdez, and D.A. Dornfeld

Session B1-2: Metrology

SC-Room B
Co-chairs: Horacio Ahuett, Tecnológico de Monterrey
Héctor Siller, Universitat Jaume I

Auto-Tuning of a High Precision Measurement System
J.A. Tarbutton* and T.R. Kurfess

Runout Evaluation of Cylindrical Features Using Discrete Surface Profile Data
S. Turek*, H. Ramaswami, S. Rajmohan, and S. Anand

Session C1-2: Micro/Nanotechnology in Non-conventional Machining and Assembly

SC-Room C
Co-chairs: Alex Elias, Tecnológico de Monterrey
Mario Martinez, Tecnológico de Monterrey

Influence of Ultrasonic Vibration on Microforming
G. Ngaile and C. Bunget

Understanding Repeatability in Nanoscale Electro-Machining Process
V. Kalyanasundaram*, K.R. Virwani, D.E. Spearot, K.P. Rajurkar, and A.P. Malshe

BioGeoFilter: A Tool for Identifying Geometrically Feasible Molecular Conformations in Real Time for Bionanomanufacturing
A.N. Brintaki* and S. Lai-Yuen

Session D1-2: Sensors and Process Monitoring 2

SC-Room D
Co-chairs: Federico Guedea, Tecnológico de Monterrey
David Villasenor, Forney Corp.

Process Monitoring in Stamping Operations Through Tooling Integrated Sensing
S. Sah* and R.X. Gao

A Cost Effective Accelerometer and DAQ for Machine Condition Monitoring: A Feasibility Study
C.A. Suprock*, B.K. Fussell, R.B. Jerard, and J.T. Roth

Condition Monitoring in End-Milling Using Wireless Sensor Networks (WSNs)
P. Wright, D. Dornfeld, and N. Ota

3:30 p.m. – 4:00 p.m.
Afternoon Coffee Break
Student Center – Lobby

4:00 p.m. – 6:00 p.m.
Lab Tours and Manufacturing Technology Demonstrations
Meet at Student Center – Lobby

6:00 p.m. – 10:00 p.m.
NAMRC Banquet
Student Center – Room E
Speaker: J. Eugenio García, Dean of Technology Based Enterprises Development, Tecnológico de Monterrey

THURSDAY, MAY 22, 2008

7:30 a.m. – 8:30 a.m.
Registration and Breakfast
Student Center – Lobby

8:30 a.m. – 10:00 a.m.
Concurrent Technical Sessions

Session A2-1: Micro/Nanotechnology in Machining Processes 1
SC-Room A
Co-chairs: Horacio Ahuett, Tecnológico de Monterrey
Ernst Kussul, Universidad Nacional Autónoma de México

Experimental Modal Analysis of Micro-Drills
S. Filiz* and O.B. Ozdoganlar

A Simplified Model for Orthogonal Micromachining of FCC Single-Crystal Materials
N. Kota* and O.B. Ozdoganlar

Experimental Investigation of Machinability and Tool Wear in Micro-Endmilling
M.B.G. Jun, R.E. DeVor, S.G. Kapoor, and F. Englert

Session B2-1: Metal Forming Processes

SC-Room B
Co-chairs: Nicolas Hendrichs, Tecnológico de Monterrey
Manuel Monreal, Metalsa

Optimization of Loading Paths for a T-Shaped Tube Hydroformed Part
S. Smith* and I-Y. Kim

An Experimental Investigation of the Robustness of an Aluminum Stamping Die Using Flexible Binders and Adjustable Drawbeads Designed Using FEM
W.J. Emblom, J. Camelio, and K.J. Weinmann

Session C2-1: Dynamic Stability in Machining Processes

SC-Room C
Co-chairs: Hugo Elizalde, Tecnológico de Monterrey
Juan Carlos Jáuregui, CIATEQ - Centro de Tecnología Avanzada

Application of the Lambert Function to Determine the Stability Lobes in Orthogonal Cutting
A. Elías-Zúñiga, C. Rodríguez, E. Delgadillo, A. Martínez, F. Araya, J. Pacheco, and V. Flores

Milling Stability Lobes Computation Through the Lambert W Function
D. Olvera, V. Calva*, J.L. González, J. Pacheco, and A. Elías-Zúñiga

Design of Experiments Based Force Modeling of the Face Grinding Process
E.C. Johnson, R. Li, A.J. Shih, and H. Hanna

Session D2-1: Process Planning and CAM/CNC

SC-Room D
Co-chairs: Ireri Heras, Interlatin Technology Solutions
Horacio Martinez, Tecnológico de Monterrey

Euler-Meusnier Sphere Based Milling Cutter Model for Curvature Gouge Avoidance in Curved Surface Machining
Y.J. Wang, Z. Dong, and G.W. Vickers

Solving Integrated Process Planning and Scheduling Problem: A Hierarchical DNA Based Approach
M. Bachlaus* and F.F. Chen

Process Planning for Flat Surfaces on Hardened Steel—Face Milling vs. Surface Grinding
C.A. Rodríguez, H.R. Siller, C. Vila, G. Bruscas, and J. Serrano

10:00 a.m. – 10:30 a.m.
Morning Coffee Break
Student Center – Lobby

10:30 a.m. – Noon
Concurrent Technical Sessions

Session A2-2: Micro/Nanotechnology in Machining Processes 2
SC-Room A
Co-chairs: Horacio Ahuett, Tecnológico de Monterrey
Ernst Kussul, Universidad Nacional Autónoma de México

Effects of Process Parameters on Surface Location Errors in Micro-Endmilling
X. Liu and M.B.G. Jun

Curvature-Based Tool-Path Segmentation for Feedrate Optimization in Micromilling
J.R. Mayor and A.A. Sodemann

Investigation of Micro Plowing Forces Through Conical Scratch Tests
M. Malekian*, S.S. Park, and K. Um

Session B2-2: Machine Tools
SC-Room B
Co-chairs: Ciro A. Rodríguez, Tecnológico de Monterrey
David Guerrero, SISAMEX

Open-Loop Velocity Planning to Mitigate the Stiction Effect in Pushing Positioning
L. Mears and T.R. Kurfess

Monte Carlo Analysis of Machine Tool Positional Accuracy and Repeatability Standards
B.A. Mullany

Session C2-2: Green Manufacturing

SC-Room A
Co-chairs: Luis Cabeza, Tecnológico de Monterrey
David Dornfeld, University of California at Berkeley

A Carbon Emission Signature for Products
J. Jeswiet

Environmental Decision Making: Supply-Chain Considerations
C. Reich-Weiser* and D. Dornfeld

A Life Cycle Environmental and Economic Comparison of Clothes Washing Product-Service Systems
K.R. Haapala*, K.L. Brown, and J.W. Sutherland

Session D2-2: Abrasive Machining Processes

SC-Room D
Co-chairs: Carlos Rivera, Tecnológico de Monterrey
Héctor Siller, Universitat Jaume I

Effect of Abrasive Content on Media Wear and Material Removal Rate in a Centrifugal Disk Mass Finishing Machine
V. Cariapa, H. Park, J. Kim, C. Cheng, J. Domblesky, and A. Evaristo

Study on the Coolant Supply Method in Grind-Hardening
J. Zhang*, P. Ge, L. Zhang, and T.C. Jen

Performance of Novel MoS_2 Nanoparticles Based Grinding Fluids in Minimum Quantity Lubrication Grinding
B. Shen, P. Kalita*, A.P. Malshe, and A.J. Shih

Noon – 1:30 p.m.

Founder's Lecture Luncheon
Executive Room (2nd Floor)
Speaker: Stephen Malkin, Distinguished Professor,
University of Massachusetts

2:00 p.m. – 3:30 p.m.

Concurrent Technical Sessions

Session A2-3: Micro/Nanotechnology in Machining Processes 3
SC-Room A
Co-chairs: Horacio Ahuett, Tecnológico de Monterrey
Ernst Kussul, Universidad Nacional Autónoma de México

An Experimental Study on a Mandrel-Based Diamond Polishing Configuration
K.P. Anandan and O.B. Ozdoganlar

Finite Element Modeling and Simulation of Micromachining Random Multiphase Materials
Y.B. Guo and S. Anurag

Toward Freeform Machining by Micro Electro Discharge Machining Process
M.M. Sundaram and K.P. Rajurkar

Session B2-3: Novel Forming Processes
SC-Room B
Co-chairs: Nicolas Hendrichs, Tecnológico de Monterrey
Hugo Martinez, Inelectra

Experimental and Numerical Investigation of Forming Limits in Incremental Forming of a Conical Cup
Y. Huang, J. Cao, K.S. Smith, B. Woody, J. Ziegert, and M. Li

A Finite Element Model for Ejection of Green Parts in PM Compaction
F. Etizaz, A. Szekeres, J. Jeswiet, and I-Y. Kim

Enhanced Formability of 5754 Aluminum Sheet Metal Using Electric Pulsing
J.T. Roth, I. Loker, D. Mauck, M. Warner, S.F. Golovashchenko, and A. Krause

Session C2-3: Machining Modeling and Simulation
SC-Room C
Co-chairs: Ciro A. Rodríguez, Tecnológico de Monterrey
Francisco Jasso, Metalsa

Determination of Friction and Material-Flow Boundary Conditions on the Tool Round Cutting Edge
N. Fang and L.S. Xiong

Determining the Deformation and Temperature History of Material Subjected to Metal Cutting
W.J. Deng, W. Xia, C. Li, X.L. Zhao, and Y. Tang

Force Predictions for Tooling Speed Limits in End Milling Using a Variable Flow Stress Machining Theory
R.A. Ekanayake and P. Mathew

3:30 p.m. – 4:30 p.m.
NAMRI/SME Membership Meeting
Student Center – Room A

4:30 p.m. – 5:30 p.m.
ASME/MED Membership Meeting
Student Center – Room A

5:45 p.m. – 7:30 p.m.
Industry Panel – *Regional Perspective on Global Engineering and Manufacturing*
Student Center – Room A
Speakers: Technology managers from regional companies in the home appliances (*Whirlpool*), consumer electronics (*Sony*), transportation (*Metalsa & Bombardier*) and aerospace sectors (*Frisa*).

7:45 p.m.
Buses Return to Howard Johnson Hotel

FRIDAY, MAY 23, 2008

7:30 a.m. – 8:30 a.m.
Registration and Breakfast
Student Center – Lobby

8:30 a.m. – 10:00 a.m.

Concurrent Technical Sessions

Session B3-1: Surface Finish and Integrity

SC-Room B

Co-chairs: Antonio Vallejo, Tecnológico de Monterrey
Héctor Siller, Universitat Jaume I

An Experimental Study of Interfacial Burr Formation in Drilling of Stacked Aluminum Sheets
T.R. Newton, J. Morehouse, S.N. Melkote, and S. Turner

Achieving Machining Residual Stresses Through Model-Driven Planning of Process Parameters
S.Y. Liang, C.R. Hanna, and R-M. Chao

Session C3-1: Manufacturing Systems

SC-Room C

Co-chairs: Jose Luis Gonzalez, Tecnológico de Monterrey
Ricardo Sánchez, Magna Powertrain

Applying Dynamic Manufacturing Resources in Collaborative Product Development Environments
Q. Peng and C. Chung

A Comparison of Concept Maps to Other Visual Modeling Techniques for Shop Floor Modeling
S.A. Habib and T.I. Freiheit

Monitoring Global and Local Variations in Multichannel Functional Data for Manufacturing Processes
H. Wang, H. Kababji, and Q. Huang

Session D3-1: Assembly Systems and Fixturing 1

SC-Room D

Co-chairs: Horacio Ahuett, Tecnológico de Monterrey
Alejandro Arrambide, NEMAK

Adaptive Assembly Planning and Control Using Function Block Technology
S. Keshavarzmanesh, L. Wang, and H-Y. Feng

Investigation of a Magnetic Chuck Tribosystem for a Reconfigurable Engine Assembly Pallet
C-H. Shen

Implementation of Automobile Cockpit Module Assembly System Using Augmented Reality Technology
H-S. Park, H-W. Choi, and J-W. Park

10:00 a.m. – 10:30 a.m.
Morning Coffee Break
Student Center – Room A

10:30 a.m. – Noon
Concurrent Technical Sessions

Session B3-2: Non-conventional Machining Processes
SC-Room B
Co-chairs: Alex Elias, Tecnológico de Monterrey
Guillermo Ortega, Flow Corp.

Study on Vibration Assisted Electron Beam Machining Process, Part I: Simulation of Vibration Assisted Solidification Process
Z. Wang, J-P. Delplanque, K. Yamazaki, Y. Daichi, and S. Sano

Study on Vibration Assisted Electron Beam Machining Process, Part II: Design and Dynamics Analysis of the Vibration Structure
Z. Wang, J-P. Delplanque, K. Yamazaki, Y. Daichi, and S. Sano

CO_2 Laser/Waterjet Cutting of Polycrystalline Cubic Boron Nitride
D. Kalyan-Sundaram, J. Wille, P. Shrotriya, and P. Molian

Session C3-2: Tool Wear
SC-Room C
Co-chairs: Ciro A. Rodríguez, Tecnológico de Monterrey
Hector Siller, Universitat Jaume I

Understanding Tool Wear of Multilayer Coated Carbides in Machining 1045 Steel
J.A. Olortegui-Yume, K-H. Park, P. Kwon, G-B. Lee, and S-B. Park

A Numerical Study of Interface Behavior of Diamond Coated Cutting Tools
J. Hu, Y.K. Chou, and R.G. Thompson

An Improved Power Threshold Method for Estimating Tool Wear During Milling
B. Desfosses, R.B. Jerard, B.K. Fussell, and M. Xu

Session D3-2: Assembly Systems and Fixturing 2
SC-Room D
Co-chairs: Horacio Ahuett, Tecnológico de Monterrey
Alejandro Arrambide, NEMAK

Model Simplification in Compliant Assembly Analysis
W. Huang and Z. Kong

Tolerance Prediction in Modular Fixtures and Proposal of Sensor-Based Modular Fixtures
J.V. Abellan, F. Romero, H.R. Siller, and C. Vila

A New Reversible Thermal Flow Gripper for Non-Rigid Productions
T.K. Lien and T.B. Gjerstad

Noon – 12:30 p.m.
Closing Ceremony and Box Lunch
Executive Room (2nd Floor)

1:00 p.m. – 6:00 p.m.
Industry Tour: Nemak
Meet at Student Center - Lobby

1:00 p.m. – 5:00 p.m.
Workshops
Cutting Tool Selection and Machining Economics, SANDVIK
Simulation Software for Metal Forming and Machining Processes, AMADA

SC: All Concurrent Sessions are held at the Student Center (SC)

*** Student author presenting the paper as part of the Student Research Presentation Contest**

2008 NAMRI/SME Scientific Committee

NAMRC 36: North American Manufacturing Research Conference
May 20-23, 2008, Tecnológico de Monterrey, Monterrey, MEXICO

COMPLETE A FORM FOR EACH INDIVIDUAL ATTENDING (INCLUDING COMPANION PROGRAM PARTICIPANTS)

Surname: _____ First Name: _____
Name to appear on nametag: _____
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Zip/Postal Code: _____ Country: _____
Day Phone: _____ Fax: _____
Email: _____
☐ Yes, I have special needs (dietary or disability) Please specify: _____
☐ Yes, I will attend the luncheon on Friday, May 23.

REGISTRATION FEES

All fees are in US Dollars and made payable to the ITESM. Registration fees include entrance to all technical sessions, all conference materials, publications, and meal functions.

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(SME or NAMRI/SME member #: _____) $450.00
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☐ Industrial Tour on Friday May 23 . . . . . $ 30.00
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☐ AMADA Workshop on Friday May 23 . . . . . $ 30.00

☐ Donation to NAMRI/SME Fund: . . . . . ____$20 ____$50 ____$100 ____Other

Total Registration Fees and Miscellaneous Fees: $ _____ USD

LODGING INFORMATION

Lodging: Lodging is not included in the registration fee and participants are responsible for making their own lodging arrangements. For more information regarding rooms reserved for NAMRC 36, please visit the conference website at http://cidyt.mty.itesm.mx/namrc

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Payments and refunds: Payments must accompany the registration form. All attendees, including presenters, must register for the conference. There will be a $100 processing fee for cancellations made prior to May 12, 2008. There will be no refunds after May 12. However, your registration may be transferred to another delegate by contacting UM Conference Services.

FOR CONFIRMATION OF REGISTRATION, COMPLETE AND RETURN THIS FORM VIA FAX BY MAY 12, 2008 TO:
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The North American Manufacturing Research Institution (NAMRI/SME) is a significant part of the Manufacturing Education & Research Community (MER) of SME. The MER concentrates on the latest education and research in manufacturing through promotion manufacturing careers and educational opportunities that enhance the diverse workforce needs of the manufacturing enterprise. Technical groups within this community include NAMRI/SME and:

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Since 1973, NAMRC has been held on the campus of a host institution to encourage a dialogue between conference attendees, offer opportunities for laboratory tours and disseminate state-of-the-art manufacturing knowledge. Institutions wishing to host a NAMRC event are encouraged to submit a proposal.

The NAMRI/SME Board of Directors reviews proposal annually. NAMRC site selections are usually made two to three years in advance to allow for adequate planning and promotion. The NAMRI/SME Operating Procedures detail the responsibilities of the host institution and the Society of Manufacturing Engineers. Submission of a written proposal and formal presentation of the proposal at a NAMRI/SME Board of Directors meeting is required. If the proposal is selected, the host institution will enter into a conference agreement with SME. The NAMRI/SME Board of Directors requires conference planning updates at its semi-annual meetings. An outline of information to include when submitting a proposal is online at www.sme.org/namri. The deadline for receipt of the proposals is April 15 to allow for review by the NAMRI/SME Board of Directors prior to their meeting at NAMRC. Proposals should be submitted to:

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NAMRC 36

An International Forum

May 20-23, 2008