

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

**Twenty-Ninth
North American
Manufacturing Research Conference**

NAMRC XXIX

May 22-25, 2001

Gainesville, Florida

Hosted by

**The University of Florida -
Machine Tool Research Center**

**System Automation and Mobility in Manufacturing Laboratory
Department of Mechanical Engineering**



North American Manufacturing
Research Institution of the
Society of Manufacturing Engineers

NAMRI 

Dear Colleagues and Friends:

We are pleased to welcome you to the Twenty-ninth North American Manufacturing Research Conference (NAMRC). The Machine Tool Research Center, the System Automation and Mobility in Manufacturing Laboratory and the Department of Mechanical Engineering in the College of Engineering at the University of Florida in Gainesville, FL, are pleased to host this year's conference on May 22-25, 2001. NAMRC is an established international forum for the presentation and critical discussion of research results and applications carried throughout universities and industry. This is the one conference where leaders in manufacturing research come together to exchange findings and leading edge technological information. Participation in NAMRC XXIX provides its authors far-reaching recognition for their work, as well as yields valuable insight from other leaders in manufacturing research.

A total of 85 technical papers have been accepted by the Scientific Committee of the North American Manufacturing Research Institution of the Society of Manufacturing Engineers (NAMRI/SME) and will be presented at the conference by researchers from universities, research institutes, and industrial research laboratories located around the world. As a special highlight to this year's event, and to honor the retirement of Dr. Jiri Tlustý, one of the founding organizers, a special session of four invited lectures on Machine Tools will present. Reprints of these lectures will be provided to attendees in a special bound volume.

Join us at the welcoming reception and the conference Opening Ceremony that will feature a keynote address by Dr. Jiri Tlustý, director of the University of Florida's Machine Tool Research Center and graduate research professor. Special eulogies will be made in respect for the recent loss of two of our manufacturing leaders, Inyong Ham and William B. Rice.

Each year, NAMRC attracts over 200 manufacturing research engineers and scientists, research and development managers, production engineers and managers, design specialists, metallurgists, manufacturing managers, research professors, graduate students, research assistants, manufacturing educators, and industry representatives from around the world. It provides not only an excellent forum for information transfer, but also a first-rate opportunity for informal discussion and networking. We look forward to your participation in this important event, renewing acquaintance with those of you who are regular attendees at this conference, and to meeting many of you who will be attending for the first time. We believe that participation in NAMRC XXIX will be both intriguing and beneficial experience for you.

Cordially,

Jiri Tlustý,
Chair

John K. Schueller,
Co-Chair

Gloria J. Wiens,
Co-Chair

John C. Ziegert,
Co-Chair

NAMRC XXIX Organizing Committee

What is NAMRC?

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 between 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 XXIX, 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.

Sponsorship

The NAMRC XXIX Organizing Committee thanks the University of Florida, its College of Engineering, the Department of Mechanical Engineering and its Machine Tool Research Center, System Automation and Mobility in Manufacturing Laboratory, and Center for Intelligent Machines and Robotics, as well as the industrial sponsors for their sponsorship of this conference.

Conference Publication

Papers accepted for and presented at NAMRC XXIX will be contained in the hard-bound Transactions of the North American Manufacturing Research Institution of SME, Volume 29, 2001. Participants who have paid the registration fee will receive a copy at the time of registration. Additional copies may be purchased by contacting an SME Customer Service Representative at (313) 271-1500, ext. 1600 or (800) 733-4763.

NAMRC XXIX Program-at-a-Glance

Hosted by the University of Florida

Gainesville, Florida USA

Morning

Afternoon

Evening

Tuesday May 22	NAMRI/SME Board Meeting Board Room, University of Florida Hotel 8:30 a.m. - 5:30 p.m.				Registration and Welcoming Reception Outdoor Dining Area, University of Florida Hotel 5:30 - 9:00 p.m.	
Wednesday May 23	Registration and Breakfast Pre-function Lobby, University of Florida Hotel 7:30 - 8:30 a.m.	Welcoming Ceremony and Keynote Address Century Ballroom B & C, University of Florida Hotel 8:30 - 9:30 a.m.	Concurrent Sessions University of Florida Hotel 10:00 a.m. - noon	Awards Luncheon and Founders Lecture Century Ballroom A, University of Florida Hotel 12:00 - 1:30 p.m.	Concurrent Sessions University of Florida Hotel 1:30 - 3:30 p.m.	Concurrent Sessions University of Florida Hotel 4:00 - 6:00 p.m.
					Laboratory Tours University of Florida, Mechanical Engineering 4:00 - 6:00 p.m.	NAMRC Banquet Century Ballroom, University of Florida Hotel 7:00 - 9:30 p.m.
				COMEC Meeting Board Room, University of Florida Hotel 1:30 - 5:30 p.m.		
Thursday May 24	Registration and Breakfast Pre-function Lobby, University of Florida Hotel 7:30 - 8:30 a.m.	Concurrent Sessions University of Florida Hotel 8:00 a.m. - noon		Luncheon and Founders Lecture Poolside Albert's Restaurant, University of Florida Hotel 12:00 - 1:30 p.m.	Concurrent Sessions University of Florida Hotel 1:30 - 3:30 p.m.	NAMRI/SME Member Meeting Hawthorne Room, University of Florida Hotel 3:45 - 5:00 p.m.
	ASME MED Executive Committee Meeting Board Room, University of Florida Hotel 8:00 am- noon					ASME MED Meeting Hawthorne Room, University of Florida Hotel 5:00 - 6:15 p.m.
Friday May 25	Registration and Breakfast Pre-function Lobby, University of Florida Hotel 7:30 - 8:30 a.m.	Concurrent Sessions University of Florida Hotel 8:00 a.m. - noon	ASME/IMECE 2001 Organization Meeting Board Room, University of Florida Hotel 10:00 a.m. - noon	Luncheon and Founders Lecture Poolside Albert's Restaurant, University of Florida Hotel 12:00 - 1:30 p.m.	Conference Adjournment 1:30 p.m.	

NOTE TO AUTHORS - The Board Room of the University of Florida Hotel will be made available for personal preparation at the following times:

Wednesday 7:30 a.m. - 1:30 p.m. & 5:30 - 7:00 p.m.
Thursday Noon - 6:30 p.m.
Friday 7:30 - 10:00 a.m.

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Conference Site

The state's oldest, largest and most comprehensive public land grant university, the University of Florida is among the nation's most academically diverse public universities and has a long history of established programs in international education, research and service.

The University is located in Gainesville, Florida, the heart of the north central Florida highlands. Surrounded by lakes, woods and prairies and only 90 minutes away from the Atlantic beaches and the Gulf shores, University of Florida boasts one of the finest climates in the world. Disney World and the entire Orlando-Kissimmee entertainment complex is only 2 hours away by interstate and turnpike. You can fly into Orlando, rent a car, and drive up to the University and combine business with family pleasure.

In addition to various campus facilities, the University of Florida is also home to several research centers that focus their studies in the area of mechanical engineering. These facilities include:

- The Machine Tool Research Center (MTRC) - The Machine Tool Research Center at the University of Florida is well equipped with state-of-the-art machine tools and supporting equipment and instrumentation. Research is focused on manufacturing, machine design, metrology, structural dynamics, CAD/CAM, and control systems.
- The Center for Intelligent Machines and Robotics (CIMAR) - The Center continues to be a leader in research and development in the areas of mechanisms, autonomous vehicles, and intelligent machines.
- The System Automation and Mobility in Manufacturing Laboratory (SAMM) - In the System Automation and Mobility in Manufacturing Laboratory, research efforts are directed toward investigations of "compliant" operations of robotic systems, parallel kinematic machines (PKMs), micro-manipulators and their applications in automating manufacturing processes, MEMS and robotics in general. Focus is on the dynamics and controls aspects of these systems.

Facilities

Various sites and facilities have been chosen for NAMRC XXIX events. The brand new University of Florida DoubleTree Hotel and Conference Center will host a majority of NAMRC events including concurrent technical sessions and various luncheons and receptions. On Thursday night, a special reception will be held at the Florida Museum of Natural History and the Harn Museum of Art, located one block from the University of Florida Hotel.

Special Activities

- Welcoming Reception - Held at the University of Florida Hotel in the Outdoor Dining area near the Conference Registration; Tuesday, May 22 from 5:30 - 9:00 p.m.
- Welcoming Ceremony and Keynote Address - Held at the University of Florida Hotel in the Century Ballroom B and C; Wednesday, May 23 from 8:30 - 9:30 a.m. Keynote address presented by Jiri Tlustý, director of the Machine Tool Research Center at the University of Florida.
- NAMRI/SME Awards Luncheon and Founders Lecture - University of Florida Hotel, Century Ballroom A; Wednesday, May 23 from 12:00 - 1:30 p.m.
- COMEC Meeting - Held in the Board Room at the University of Florida Hotel; Wednesday, May 23 from 1:30 - 5:30 p.m.
- NAMRC Banquet - Held in the Century Ballroom at the University of Florida Hotel; Wednesday, May 23 from 7:00 - 9:30 p.m.
- NAMRI/SME Member Meeting - Thursday, May 24 from 3:45 - 5:00 p.m. in the Hawthorne Room at the University of Florida Hotel.
- ASME MED Member Meeting - Thursday, May 24 from 5:00 - 6:15 p.m. in the Hawthorne Room at the University of Florida Hotel.
- NAMRC Reception - Thursday, May 24 from 6:30 - 9:30 p.m. at the Florida Museum of Natural History and the Harn Museum of Art.

Laboratory and Campus Tours

Wednesday, May 23 from 4:00 - 6:00 p.m.

Thursday, May 24 from 4:00 - 6:00 p.m.

NAMRC XXIX will provide transportation to tour the Machine Tool Research Center, the Center for Intelligent Machines and Robotics, and the System Automation and Mobility in Manufacturing Laboratory, plus other manufacturing related laboratories located on campus.

You may also want to take a tour of the University of Florida campus on your own. Maps of the campus will be provided in your registration packet.

Guest Program

Miracle on 34th Street Museums - Tuesday, May 22, 2001

These are self-guided tours of the Florida Museum of Natural History and the Harn Museum of Art. These museums are located directly across the street from the University of Florida Hotel and Conference Center.

Historic St. Augustine Tour - Wednesday, May 23, 2001

This full-day tour will provide the opportunity to visit historic St. Augustine, Florida, the oldest city in the continental United States. Tour guides will pick you up at your hotel at 8:00 a.m. and drive to St. Augustine via Melrose and Palatka, Florida. Tour participants will return in time for the Wednesday evening NAMRC Banquet at the host hotel.

Nature's Wonders Tour - Thursday, May 24, 2001

See some of the natural wonders of this region as well as enjoy a relaxing, fun canoe trip on the Santa Fe River. Tour guides will pick you up at your hotel at 8:00 a.m. You will begin with a walk down into the Devil's Millhopper, a 500-foot wide, 120-foot deep geological formation that contains plants rarely found in Florida, along with small waterfalls.

Antique Lovers/Plants and Prairies Tours - Thursday, May 24, 2001

This tour will journey to Micanopy, the oldest town in the area, dating to 1824. You will visit the Thrasher Warehouse Museum, explore the antique shops and galleries for which the town is noted, and visit a 20,000-acre wildlife sanctuary. For both tours on Thursday, tour participants will return to the hotel in time for the NAMRC Reception.

Registration Fees

All fees are in US dollars and are payable to the University of Florida. We accept cash, checks, money orders, VISA or MasterCard, and electronic fund transfers (additional service fee will apply). Complete one registration form per person. Guest Program participants should complete their own registration form. Make additional copies of the form as needed.

All fees except the guest registration includes entrance to all technical sessions, all conference materials, publications, meal functions, and laboratory tours, which include transportation. Included in the guest registration fees are conference breakfasts, banquet and two receptions; and guest program tour (see Guest Program for details). There are no single-day registration fees. There are no reduced registration fees for authors or session chairs.

Cancellations and Refunds

Refunds, less an administrative fee of \$100.00 will be made for all cancellations received in writing with a postmark before May 10, 2001. No refunds will be made after that date, but a substitution of attendees may be made by notifying the Department of Conferences 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 had made payment. Should this event cancel in entirety, the University's liability is limited to a refund of the registration fees paid.

Lodging

NAMRC 2001 will be held at the University of Florida Hotel and Conference Center - A DoubleTree Hotel. A block of rooms is reserved for NAMRC attendees at a reduced rate of \$119 per night for a king or double room; the student rate is \$109 per night for a king or double room. Please contact the hotel directly at (352) 378-0070 by April 22, 2001 and mention "NAMRC" to receive the reduced rate. If you are a student, mention "NAMRC Student". You may also make reservations online by visiting the University of Florida Hotel's Web site: www.ufhotel.com.

The University of Florida Hotel and Conference Center is located on SW 34th Street directly across from the Harn Museum of Art on the University of Florida Campus between Hull Road and 19th Ave. This offers quick accessibility to the entire university campus and is just 15 minutes away from Gainesville Regional Airport, Interstate 75 and Highway 441.

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

Special Needs

The University of Florida provides reasonable access for persons with disabilities and other special needs, such as dietary. Please notify the Department of Conferences if special accommodations are needed to participate in this conference, by indicating accommodation on the registration form or by calling (352) 392-1701 or e-mail conferences@doce.ufl.edu.

How to Register

Online:

www.doce-conferences.ufl.edu/NAMRC

This is a secure server for your method of payment.

Mail:

Complete the registration form at the back of this brochure and mail it with your payment using check, money order, or charge card number to:

University of Florida

Conference Department

PO Box 113172

Gainesville, FL 32611-3172.

Fax:

(352) 392-6950

Attention: Conference Department.

Call:

(352) 392-1701

Ask to register for NAMRC.

For More Information

Visit the NAMRC XXIX Web site: www.sme.org/namri and link to the NAMRC XXIX information. Or visit direct at www.doce-conferences.ufl.edu/NAMRC. Call (352) 392-1701 or e-mail conferences@doce.ufl.edu

NAMRC XXIX Technical Sessions and Programs

Tuesday, May 22, 2001

8:30 a.m. - 5:30 p.m.

NAMRI/SME Board Meeting

Board Room, University of Florida Hotel & Conference Center

5:30 p.m. - 9:00 p.m.

Conference Registration and Welcoming Reception

Outdoor Dining Area, University of Florida Hotel & Conference Center

Wednesday, May 23, 2001

7:30 a.m. - 8:30 a.m.

Registration and Breakfast

Pre-function Lobby - Breakroom, University of Florida Hotel & Conference Center

8:30 a.m. - 9:30 a.m.

Welcoming Ceremony

Century Ballroom B & C, University of Florida Hotel & Conference Center

Opening Remarks:

Jiri Tlustý, Chair NAMRC XXIX

Welcoming Remarks:

Rajiv Shivpuri, President, NAMRI/SME

M. Jack Ohanian, Dean, University of Florida, College of Engineering

Keynote Address:

Subjective History of Chatter Research

Jiri Tlustý, Director, Machine Tool Research Center, University of Florida

9:30 a.m. - 10:00 a.m.

Refreshment Break

10:00 a.m. - 12:00 noon

Concurrent Technical Sessions

Session 1-A: Invited Lectures on Machine Tools

Hawthorne, University of Florida Hotel & Conference Center

Co-Chairs: John Ziegert, University of Florida

Scott Smith, University of North Carolina at Charlotte

Feed Drives for High Speed Machine Tools

G. Pritschow, University of Stuttgart

Techniques of Modeling, Predicting and Controlling of Chatter

S. Smith, University of North Carolina at Charlotte

Session 1-B: Forming I - Rolling

Hickory, University of Florida Hotel & Conference Center

Co-Chairs: Jack Jeswiet, Queen's University

Jian Cao, Northwestern University

Simplified Three-Dimensional Simulation of Ring Rolling With Grooved Rolls By Rigid-Plastic Finite Element Method Using Generalized Plane-Strain Modeling

K. Mori, and N. Hiramatsu, Toyohashi University of Technology

Analysis of Interfacial Slip in a Two-Roll Cross Wedge Rolling Process

Q. Li, M.R. Lovell, and Z. Deng, University of Pittsburgh

Caliber Design in Shape Rolling by Finite Element Method

H.J.Kim, and Y.Lee, POSCO Technical Research Laboratories; S.M. Hwang, Pohang University of Science and Technology

A Prediction of the Surface Profile of the Exit Cross Section in Rod Rolling

Y.Lee and W.Y. Choo, POSCO Technical Research Laboratories; H.J.Kim and S.M. Hwang, Pohang University of Science and Technology

Session 1-C: Manufacturing Systems I -Microtechnology

Azalea, University of Florida Hotel & Conference Center

Co-Chairs: Ajay P. Malshe, University of Arkansas

Shreyes N. Melkote, Georgia Institute of Technology

Fabrication of NiAl Intermetallic Reactors for Microtechnology-Based Energy Chemical Systems (MECS)

D.E. Alman and R.D. Wilson, Albany Research Center; B.K. Paul, Oregon State University

Limits on Aspect Ratio in Two-Fluid Micro-Scale Heat Exchangers

B.K. Paul, H. Hasan and J.S. Thomas, Oregon State University; R. D. Wilson, and D. Alman, Albany Research Center

Fabrication of Mesoscopic, Flexible, High Pressure, Microchannel Heat Exchangers (MHEx)

J.C. Selby, M.L. Philpott and M.A. Shannon, University of Illinois at Urbana-Champaign

Characterization of Metallic Foil Joints Using Diffusion Bonding and Diffusion Soldering in Micro-Technology-Based Energy and Chemical Systems

M. Gabriel and B.K. Paul, Oregon State University; R.D. Wilson and D.E. Alman, Albany Research Center

12:00 noon - 1:30 p.m.

NAMRI/SME Awards Luncheon and Founders Lecture

Century Ballroom A, University of Florida Hotel & Conference Center

Presiding: Rajiv Shivpuri, President, NAMRI/SME

Lecturer: Milton Shaw, Professor Emeritus, Arizona State University

1:30 p.m. - 3:30 p.m.

Concurrent Technical Sessions

Session 2-A: Material Removal I - Dynamics

Hawthorne, University of Florida Hotel & Conference Center

Co-Chairs: Robert Hocken, University of North Carolina at Charlotte

Shounak Athavale, Ford Research Laboratory

Interrelation of Stiffness and Damping in Machine Tool Dynamics

E.I. Rivin, Wayne State University

A Study on Centerless Grinding with Variable Stiffness Regulating Wheel

V. Radhakrishnan, M.Ravishankar, R.S. Hari, and N. Ramesh Babu, Indian Institute of Technology Madras

A New Stable Speed Test Apparatus for Milling

J.P. Snyder, University of North Carolina at Charlotte; M.A. Davies and J.R. Pratt, NIST; S. Smith, University of North Carolina at Charlotte

The Existence and Effects of Overlap Factors Greater Than Unity and Less Than Zero

W.J. Endres, The University of Michigan; O. B. Ozdoganlar, University of Illinois at Urbana-Champaign

Session 2-B: Forming II - Friction

Hickory, University of Florida Hotel & Conference Center

Co-Chairs: Ken-Ichiro Mori, Toyohashi University of Technology

Michael Lovell, University of Pittsburgh

A Friction Sensor For A Sheet Metal Forming Simulator

J. Jeswiet, P. Wild an H. Sefton, Queen's University

FEM Simulation of Clinched Joints Behavior

D. Antonelli and L.M. Settineri, Politecnico di Torino

Influence of Anisotropy on Friction Estimated by the Ring Test

P. Huml and H. Han, Royal Institute of Technology

Lubrication in Tube Hydroforming (THF)

G.Ngaile, V. Federico, K. Tibari and T. Altan, The Ohio State University

Session 2-C: Manufacturing Systems II - Controls and Systems Design

Azalea, University of Florida Hotel & Conference Center

Co-Chairs: Kornel F. Ehmann, Northwestern University
Doug Dinon, GE Corporate Research

Controller Design for a Platform Based Automated Finishing System
G. J. Wiens, University of Florida; N.K.Jhaveri, Fanuc Robotics North America

Modular Technologies for Intelligent Motion Unit with Linear Motor and Axis Control
B. Koninckx, and H. Van Brussel, Katholieke Universiteit Leuven; J. Van Eijk, and
N. Meijerman, Philips CFT

Distributed Control of Machine Capacity and Production Scheduling
S. Cho and V.V. Prabhu, The Pennsylvania State University

*Evaluation of the Plant Design of Two Automotive Suppliers Using the
Manufacturing System Design Decomposition*
J. Linck and D.S. Cochran, Massachusetts Institute of Technology; P. Neise,
Technical University of Munich

1:30 p.m. - 5:30 p.m.

Council Of Manufacturing Engineering Chairs/Coordinators (COMEC) Meeting
Board Room, University of Florida Hotel & Conference Center

3:30 p.m. - 4:00 p.m.

Refreshment Break

4:00 p.m. - 6:00 p.m.

Concurrent Technical Sessions

Session 3-A: Material Removal II - Difficult Materials

Hawthorne, University of Florida Hotel & Conference Center

Co-Chairs: I.S. Jawahir, University of Kentucky
Walter W. Olson, The University of Toledo

Milling of Titanium Alloy Using Directed Through Spindle Coolant
D.Barnett-Ritcey, R. Hachmöller and M.A. Elbestawi, McMaster University

Tool Life, Wear Rates, and Surface Quality in Hard Turning
T.G. Dawson and T.R. Kurfess, Georgia Institute of Technology

*An Experimental Investigation into the Machining of SiCp/Mg Metal Matrix
Composite*
W.E. Pedersen and M. Ramulu, The University of Washington

Machining Characteristics of a Titanium Metal Matrix Composite
S.M. Hayes, M. Ramulu and W.E. Pedersen, The University of Washington

Session 3-B: Forming III - Sheet Metals

Hickory, University of Florida Hotel & Conference Center

Co-Chairs: Taylan Altan, The Ohio State University
Y. Lawrence Yao, Columbia University

*Optimization of the Blankholder Thickness For Sheet Metal Forming Using Finite
Element Analysis*
W. Neher, K.J. Weinmann and W.J. Emblom, Michigan Technological University

*Optimization Design of Variable Blankholder Force in U-Shaped Part Forming to
Eliminate Springback Error*
Z. Lin, G. Liu, W. Xu and Y. Bao, Shanghai Jiaotong University

Incremental Single Point Forming
J. Jeswiet, Queen's University

Enhancement of Sheet Metal Formability via Local Adaptive Controllers
B.L.Kinsey and J. Cao, Northwestern University

Session 3-C: Manufacturing Systems III - Tolerances and Analysis

Azalea, University of Florida Hotel & Conference Center

Co-Chairs: Shiv G. Kapoor, University of Illinois at Urbana-Champaign
Matthew A. Davies, National Institute of Standards and Technology

*The Tolerance Analysis and Optimization Problem: Modelling Issues and
Experimental Verification*
M. Gadallah, Cairo University

*Prediction of Component Dimensional and Geometric Accuracy Through
Manufacturing Error Synthesis*
Q. Liu and S. H. Huang, The University of Toledo

Robust Evaluation of Straightness and Flatness Tolerance Using Simulated Annealing
L. J. Hong, B. Shultes and S. Anand, University of Cincinnati

Linear State Space Modeling of Dimensional Machining Errors
D. Djurdjanovic and J. Ni, The University of Michigan

4:00 p.m. - 6:00 p.m.

Concurrent Laboratory Tours

University of Florida Campus (Transportation Provided)

7:00 p.m. - 9:30 p.m.

NAMRC Banquet

Century Ballroom, University of Florida Hotel & Conference Center

7:30 a.m. - 8:30 a.m.

Registration and Breakfast

Pre-function Lobby - Breakroom, University of Florida Hotel & Conference Center

8:00 - 10:00 a.m.

Concurrent Technical Sessions

Session 4-A: Material Removal III - Finishing

Hawthorne, University of Florida Hotel & Conference Center

Co-Chairs: William J. Endres, The University of Michigan
Brian K. Paul, Oregon State University

Study of the Magnetic Tool Behavior and Its Relationship to the Processing Characteristics in a Magnetic Field Assisted Barrel Finishing Process
H. Yamaguchi, T. Shinmura and N. Horiuchi, Utsunomiya University

Qualitative Analysis of the Wear of Stone and Ring in Superfinishing Bearing Rings, Using FEM
G. Dontu, S. Cioc, S. Neagu-Ventzel, I. Marinescu and W. Olson, The University of Toledo

Visualization of Grit Interactions During the Ductile to Brittle Polishing Transition
R. B. Mindek, Jr., National Institute of Standards and Technology, Western New England College; E. P. Whinton and C. J. Evans, National Institute of Standards and Technology

Simulation of Wafer Scale Variations in Chemical Mechanical Polishing
S. Eamkajornsiri, G. Fu, R. Narayanaswami and A. Chandra, Iowa State University

Session 4-B: Material Removal IV - Environmental and Cutting Mechanics

Hickory, University of Florida Hotel & Conference Center

Co-Chairs: Günther Pritschow, University of Stuttgart
Yung C. Shin, Purdue University

Model of Biomass Concentration in a Metalworking Fluid Reservoir Subject to Constant Biofilm Contamination During Membrane Filtration
S. J. Skerlos, R. E. DeVor, S. G. Kapoor, N. Rajagopalan and R. A. Sanford, University of Illinois at Urbana-Champaign

Environmentally Friendly Dry Cutting Using Heat Absorption Tool
M. Jin, H. Noguchi and M. Murakawa, Nippon Institute of Technology

Low Speed Orthogonal Machining of Copper with a Hardness Gradient
L. N. Payton and J. T. Black, Auburn University

Modeling of Ductile Cutting of Tungsten Carbide
K. Liu and X. Li, National University of Singapore

Session 4-C: Manufacturing Systems IV - CAD and Process Modeling

Azalea, University of Florida Hotel & Conference Center

Co-Chairs: Michael Philpott, University of Illinois at Urbana-Champaign
Edward C. De Meter, The Pennsylvania State University

Method for Creating High Quality Computer Model from Rough Model
H. Aoyama and Y. Nishizawa, Keio University

Face Assignment for Three Dimensional Coordinate Measurement Data
A. A. Claudet and T. R. Kurfess, Georgia Institute of Technology

Surface Modeling Based on Characteristic Lines
T. Kusunoki and H. Aoyama, Keio University

Agent Interaction in CAD/CAM
D. Dornfeld, P. K. Wright, S. Roundy, A. Rangarajan and S.-H. Ahn, University of California at Berkeley

8:00 a.m. - 12:00 noon

ASME Manufacturing Engineering Division (MED) Executive Committee Meeting

Board Room, University of Florida Hotel & Conference Center

10:00 a.m. - 10:30 a.m.

Refreshment Break

10:30 a.m. - 12:00 noon

Concurrent Technical Sessions

Session 5-A: Material Removal V - Grinding

Hawthorne, University of Florida Hotel & Conference Center

Co-Chairs: Ioan Marinescu, The University of Toledo
Michael Branch, Storage Technology

Specific Grinding Energy Causing Thermal Damage in Helicopter Gear Steel
J. E. Mayer, Jr., A. H. Price, G. K. Purushothaman and A. K. Dhayalan, Texas A & M University; M. S. Pepi, Army Research Laboratory

Burr Formation in Grinding of Hardened Steel with Conventional and Superabrasive Wheels
C. Barth, R. Dollmeier and G. Warnecke, University of Kaiserslautern

Surface Grinding In Silicon Wafer Manufacturing
Z. J. Pei, Kansas State University; G. R. Fisher, MEMC Electronic Materials Inc.

Session 5-B: Forming IV - Forming Processes

Hickory, University of Florida Hotel & Conference Center

Co-Chairs: Steven Schmid, Notre Dame University
Alvin Sabroff, Metal Working Consultants

Analysis of Springback Using Simulation and Experimental Design
C. J. Gomes, O. Onipede, M. Lovell, B. Norman and J. Rajgopal, University of Pittsburgh

Precision Shearing of Steel Channel Sections
M. Murakawa, M. Jin, T. Kohinata and S. Thipprakmas, Nippon Institute of Technology; M. Jianhua, Huazhong University of Science and Technology

Experimental Investigation Into Double Cup Extrusion Type Tribo-Test
K. Dohda and Z. Wang, Gifu University

Session 5-C: Material Removal VI - Drilling

Azalea, University of Florida Hotel & Conference Center

Co-Chairs: David Dornfeld, University of California at Berkeley
Eugene I. Rivin, Wayne State University

Optimization of the Process Parameters in Drilling Using a Power Sensor For OnLine Estimation of Tool Wear
J. M. Lim, Singapore Shinei Sangyo Pte Ltd.; J. A. Stori, University of Illinois at Urbana-Champaign

Design and Implementation of a Helical Drill Point Grinder
S. Ganglani and K. F. Ehmann, Northwestern University

The Indentation Zone of a Twist Drill
M. J. Bono and J. Ni, The University of Michigan

12:00 noon - 1:30 p.m.

Luncheon

Poolside and Albert's Restaurant, University of Florida Hotel & Conference Center

1:30 p.m. - 3:30 p.m.

Concurrent Technical Sessions

Session 6-A: Material Removal VII - Modeling

Hawthorne, University of Florida Hotel & Conference Center

Co-Chairs: John E. Mayer, Jr., Texas A&M University
John Roth, Arkansas State University

Mechanistic Force Modeling With Time-Dependent Characteristics Due to Tool Wear For Face Turning of Ni-Based Super Alloys
B. E. Clancy, B. Rao and Y. C. Shin, Purdue University

The Optimal Selection of Cutting Parameters in Turning Operations
M. S. Hong and Z. M. Lian, Ajou University

A Finite Element Analysis of 2-D Machining with a Grooved Tool
H. Zhang, O. W. Dillon, Jr. and I. S. Jawahir, University of Kentucky

Multi-Constraint Optimization Analyses and Simulation of Single Pass Turning with Modern Chip Breaker Tools

E. J. A. Armarego and D. Ostafiev, The University of Melbourne

Session 6-B: Forming / Material Removal - Laser and Thermal

Hickory, University of Florida Hotel & Conference Center

Co-Chairs: Klaus J. Weinmann, Michigan Technological University
Amit Bagchi, MTD Products, Inc.

Laser Forming of Titanium Aircraft Parts

D. F. Walczyk and S. Vittal, Rensselaer Polytechnic Institute

Cooling Effects in Multiscan Laser Forming

J. Cheng and Y. L. Yao, Columbia University

Temperatures in Ironing of Polymer-Coated Steels

C.-H. Huang and S. R. Schmid, University of Notre Dame

A Model for Workpiece Temperatures During Peripheral Milling Including the Effect of Cutting Fluids

G. Shen, A. Gandhi, O. Arici and J. W. Sutherland, Michigan Technological University

Session 6-C: Manufacturing Systems V - Error Compensation

Azalea, University of Florida Hotel & Conference Center

Co-Chairs: Thomas R. Kurfess, Georgia Institute of Technology
Jerzy Kozak, University of Nebraska at Lincoln

A Comparison of Support Vector Machines With Artificial Neural Networks for the Prediction of Thermal Errors in Machine Tools

R. Ramesh, M. A. Mannan and A. N. Poo, The National University of Singapore

Machining Error Compensation Using Neural Network and On-Machine-Measurement Database

M. W. Cho, Inha University; T.-I. Seo and H.-D. Kwon, Korea Institute of Industrial Technology; M.-K. Kim, Korea University of Technology and Education; S.-H. Yang, Kyungpook National University

Quick Identification of Spatial-Variant Thermal Errors Using On-Machine Measurement of a 3D Artifact *

K.-D. Kim and S.-C. Chung, Hanyang University

Laser-CCD Based 6 Degree-of-Freedom Machine Error Measuring System (LC6DMS)

Y. Kagawa, Y. Yang, K. Yamazaki and J. Liu, University of California, Davis

3:30 p.m. - 3:45 p.m.

Refreshment Break

3:45 p.m. - 5:00 p.m.

NAMRI/SME Member Meeting

Hawthorne, University of Florida Hotel & Conference Center

5:00 p.m. - 6:15 p.m.

ASME MED Member Meeting

Hawthorne, University of Florida Hotel & Conference Center

4:00 p.m. - 6:00 p.m.

Concurrent Laboratory Tours

University of Florida Campus (Transportation Provided)

6:30 p.m. - 9:30 p.m.

NAMRC Reception

Florida Museum of Natural History and Harn Museum of Arts, University of Florida

Friday, May 25, 2001

7:30 a.m. - 8:30 a.m.

Registration and Breakfast

Pre-function Lobby - Breakroom, University of Florida Hotel & Conference Center

8:00 a.m. - 10:00 a.m.

Concurrent Technical Sessions

Session 7-A: Material Removal VIII - Tools

Hawthorne, University of Florida Hotel & Conference Center

Co-Chairs: Edward J. A. Armarego, The University of Melbourne
Vis Madhavan, Wichita State University

Thermophysical-Property-Based Selection of Coatings for Dry Machining of Carbon and Stainless Steels

W. Grzesik, P. Nieslony and M. Bartoszuik, Technical University of Opole

Model-Based Design of Rotating-Insert Tools for Metal Cutting Applications

J. Manjunathaiah, P. M. Beecherl and P. S. Szuba, Lamb Technicon Machining Systems; W. J. Endres, The University of Michigan

An Approach for Tool Sequence Selection in Three Axis Rough Machining

M. Balasubramaniam, Y. Joshi and S. Sarma, Massachusetts Institute of Technology; Z. Shaikh, Ford Motor Company

Prediction and Validation of Cutting Forces in Machining of Plain Carbon Steels with Chip Breaker Tools

J. A. Arsecularatne, The University of New South Wales; I. S. Jawahir, University of Kentucky

Session 7-B: Material Removal IX - Tool Wear

Hickory, University of Florida Hotel & Conference Center

Co-Chairs: Kamlakar P. Rajurkar, University of Nebraska at Lincoln
Christopher A. Brown, Worcester Polytechnic Institute

Self-Adaptive Tool Wear Monitoring System in Milling Process

T. Matsumura and E. Usui, Tokyo Denki University

Understanding the Mechanisms of Crater Wear

W. Kim and P. Kwon, Michigan State University

The Effect of Austenization on Flank Wear in Machining Steels

W. Kim and P. Kwon, Michigan State University

Tool Wear Monitoring in Machining Processes Through Wavelet Analysis

L. Wang, M. G. Mehrabi and E. Kannatey-Asibu, Jr., The University of Michigan

Session 7-C: Manufacturing Systems VI - Fixturing

Azalea, University of Florida Hotel & Conference Center

Co-Chairs: Jun Ni, The University of Michigan

Stephen A. Batzer, University of Arkansas

Simulations and Experiments in Encapsulation Fixturing

E. Lee, S. E. Sarma and P. V. Alvarado, Massachusetts Institute of Technology

Experimental Study of the Effect of Conformability on Static Stability in a Flexible Machining Fixture

J. F. Hurtado and S. N. Melkote, Georgia Institute of Technology

Part Location Algorithms For An Intelligent Fixturing System

D. Chakraborty, DaimlerChrysler Corporation; E. C. De Meter, The Pennsylvania State University; P. S. Szuba, Lamb Technicon Machining Systems

10:00 a.m. - 11:00 a.m.

ASME MED 2001 IMECE Symposia Organizers Planning Meeting

Board Room, University of Florida Hotel & Conference Center

10:00 a.m. - 10:30 a.m.

Refreshment Break

10:30 a.m. - 12:00 noon

Concurrent Technical Sessions

Session 8-A: Material Removal X - Laser

Hawthorne, University of Florida Hotel & Conference Center

Co-Chairs: Bin Wei, GE Corporate Research

Daniel F. Walczyk, Rensselaer Polytechnic Institute

Laser Micromachining of a Biodegradable Polymer

V. V. Kancharla and S. Chen, Iowa State University; D. S. Zamzow and D. P. Baldwin, Ames Laboratory of U. S. Department of Energy

Laser Assisted Electrochemical Machining
J. Kozak and K. P. Rajurkar, University of Nebraska - Lincoln

Feasibility Study of Inducing Desirable Residual Stress Distribution in Laser Micromachining
W. Zhang and Y. L. Yao, Columbia University

Session 8-B: Material Removal XI - Numerical Control Machining
Hickory, University of Florida Hotel & Conference Center

Co-Chairs: J T. Black, Auburn University
Philip S. Szuba, Lamb Technicon Machining Systems

Calculation of Variable Feed Rate and Spindle Speed for Nurbs Based CNC Machining
K. K. Krishnan, J. Kappen and B. Bahr, Wichita State University

Forward Step Determination for Five-Axis Cutter Contract Tool Paths
H. Li and H.-Y. Feng, The University of Western Ontario

Velocity Performance of 5-Axis Machine Tools With Respect To a Surface
T. Kim and S. E. Sarma, Massachusetts Institute of Technology

Session 8-C: Manufacturing Systems VII - Welding
Azalea, University of Florida Hotel & Conference Center

Co-Chairs: John Sutherland, Michigan Technological University
James Stori, University of Illinois at Urbana-Champaign

Solid Mechanics Simulation of Friction Stir Welding Process
X. Deng and S. Xu, University of South Carolina

Improvement in Droplet Transfer Process of Gas Metal Arc Welding by Wire Oscillation
R. Kovacevic, Y. Wu and G. Tao, Southern Methodist University

Robust Design with Parameter Interdependency in Resistance Spot Welding
W. Li, The University of Washington; S. J. Hu, The University of Michigan; S.-W. Cheng, Institute of Statistical Science

12:00 noon - 1:30 p.m.

Luncheon

Poolside and Albert's Restaurant, University of Florida Hotel & Conference Center

1:30 p.m.

Conference Adjournment

Conference Registration Form

NAMRC XXIX

May 22-25, 2001 • Gainesville, Florida USA

Complete a form for each individual attending (including Guest Program Registrants).
Make copies as necessary.

First Name: _____ Last Name: _____
Name, as it should appear on nametag: _____
Academic Title: _____
Professional Title: _____
Company/Organization Affiliation: _____
Address: _____
City: _____ State/Province: _____
Postal Code: _____ Country: _____
Phone Number: _____ Fax Number: _____
E-mail Address: _____ Web Address: _____

Registration Fees

- | | |
|--|--------------|
| <input type="checkbox"/> Full Conference Registration before May 3, 2001 | \$375.00 USD |
| <input type="checkbox"/> Full Conference Registration after May 3, 2001 | \$425.00 USD |
| <input type="checkbox"/> Student/Retiree Conference Registration | \$125.00 USD |
| <input type="checkbox"/> Guest Program Registration | \$155.00 USD |

TOTAL: _____

Other Information

- Yes, I am presenting a paper or other lecture at NAMRC.
Audio/Visual Requirements: _____
- Yes, I have special needs (dietary or disability).
Please specify: _____
- Yes, I will attend the Friday Luncheon.

Payment

All fees are in US Dollars.

Make checks payable to University of Florida

Credit Card Payments (Visa or MasterCard only, circle one)

Card Number: _____

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Fax to: (352) 392-6950
Attention Conference Department

Online: www.doce-conferences.ufl.edu/NAMRC
This is a secure server for your method of payment

IMPORTANT NOTICE: Reservation at Hotel must be made by April 22, 2001 to receive the conference rate of \$119 per night, king/double room (\$109 per night student rate). Phone (352) 378-0070 or visit www.ufhotel.com