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**NAMRC XVII**  
May 24-26, 1989  
The Ohio State University  
Columbus, Ohio 43210 USA

Society of Manufacturing Engineers  
NAMRI/SME  
One SME Drive, P.O. Box 930  
Dearborn, MI 48121-0930 USA



**NAMRI**



**NAMRI**

**North American  
Manufacturing Research  
Institution of  
SME Announces...**

**SEVENTEENTH  
NORTH AMERICAN  
MANUFACTURING  
RESEARCH  
CONFERENCE**

**NAMRC XVII**

**MAY 24-26, 1989  
THE OHIO STATE UNIVERSITY  
COLUMBUS, OHIO 43210 USA**



# SEVENTEENTH NORTH AMERICAN MANUFACTURING RESEARCH CONFERENCE—NAMRC XVII



## REGISTRATION AND GENERAL INFORMATION

### CONFERENCE PROSPECTUS

The Seventeenth North American Manufacturing Research Conference (NAMRC XVII) is designed to provide a forum for the timely presentation and critical discussion of results from basic and applied research in material forming, material removal and manufacturing systems/automation. The papers presented at this conference will describe research in the areas of forming and machining of metals and other materials, non-traditional manufacturing processes and the systems aspects of manufacturing. All papers presented at the conference are contained in the bound volume titled "Transactions of the North American Manufacturing Research Conference 1989." These papers have been accepted based upon a review of the papers in their full-length form. The conference highlights manufacturing research activities in important centers around the world.

There are three parallel conference sessions: material forming, material removal and manufacturing systems. The sessions will include formal presentations of the papers and a discussion period following each presentation. We urge you to attend and actively participate in this conference.

### CONFERENCE LOCATION AND TRANSPORTATION TO CONFERENCE (See Map)

The conference will be held at The Ohio State University in Columbus, Ohio. All conference sessions will be held in the Fawcett Center for Tomorrow, 2400 Olentangy River Road.

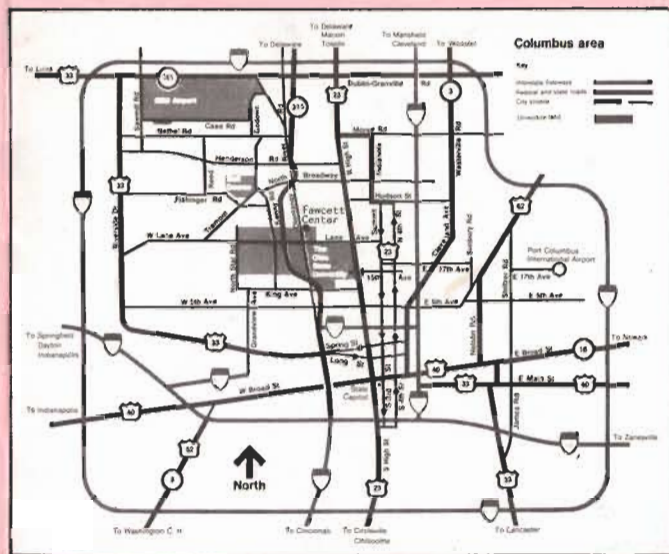
Columbus is served by the following airlines: TWA, US Air, United, American, Northwest, Delta, Eastern, Continental, Braniff, Piedmont, Midway, Air Canada, and several commuter lines. Standby taxicab service is available for the 20 minute ride to Fawcett Center at approximately \$14.00.

### PARKING

Conference parking is available at Fawcett Center and the hotels at no charge.

### TRANSACTIONS

All registered conference participants will receive one bound copy of the "Transactions of the North American Manufacturing Research Conference 1989" at conference registration. Additional copies may be purchased at the conference or, after June 1, 1989, by mail order through the Society of Manufacturing Engineers, One SME Drive, P.O. Box 930, Dearborn, Michigan 48121-0930 USA telephone (313) 271-1500, Ext. 418. The cost per copy is \$70.00 for NAMRI/SME and SME Members, and \$75.00 for nonmembers.



### LODGING

Blocks of rooms are being held for conference participants at the Fawcett Center and several other Columbus hotels until specified cut-off dates. Conference attendees are urged to make their reservations early. To receive special conference rates, mention that you are attending the North American Manufacturing Research Conference. Rates listed below do not include tax. Lodging choices are:

	Rates	Cut-Off Dates
Fawcett Center 2400 Olentangy River Rd. (614) 292-1342	\$40.00 Single \$48.00 Double (plus tax)	April 24, 1989
Holiday Inn on the Lane 328 West Lane Ave. (614) 294-4848	\$48.00 Single \$56.00 Double (plus tax)	May 2, 1989
University Inn 3110 Olentangy River Rd. (614) 263-7355	\$45.00 Single \$45.00 Double (plus tax)	May 2, 1989
Parke University Hotel 3025 Olentangy River Rd. (614) 267-1111	\$48.00 Single \$52.00 Double (plus tax)	May 1, 1989

### SPOUSE PROGRAM/SON OF HEAVEN EXHIBIT

Activities for spouses have been planned for two days. On Wednesday, May 24, the group will tour The Ohio State University campus and landmarks of Columbus including

the charming 19th century restored section known as German Village. The group will have lunch at one of Columbus' finest restaurants. This day concludes with the conference banquet at Confluence Park restaurant. The Spouse Program fee includes a banquet ticket.

On Thursday, May 25 the group will visit the Son of Heaven Exhibit, a magnificent collection of ancient Chinese art objects. These rare objects include terra cotta life-sized soldiers and horses, a jade burial suit from an emperor's tomb, a gold lacquer throne, and a chime of 26 bronze bells. Columbus is one of only two U.S. cities which this Chinese exhibit is visiting. The group will have lunch at a Chinese restaurant. For more information about the Son of Heaven Exhibit, call (614) 224-7744.

Fees for the Spouse Program are \$80.00 for advanced registration and \$90.00 for on-site registration. To register, complete the appropriate information on the registration form.

### REGISTRATION FEES

Registration fees for NAMRC XVII are \$225.00 (U.S. currency) for advance registration and \$250.00 (U.S. currency) for on-site registration on May 23, 24, and 25. The fee includes entrance to all technical sessions, refreshments, two luncheons, the conference banquet, and a bound copy of the conference Transactions. There will be no one-day registration fees nor will there be any reduced fees for authors or session chairs.

The student registration fee is \$60.00 (U.S. currency) in advance or \$75.00 (U.S. currency) on site. This fee is a special rate to encourage attendance by students, and includes all technical sessions and a bound copy of the conference Transactions. It does not include meals. Students may order and purchase banquet and luncheon tickets by indicating their requests on the registration form and including the fees in their payment.

Fees for the Spouse Program are \$80.00 for advance registration and \$90.00 for on-site registration.

Refunds of registration fees will be made, minus a \$15.00 processing fee, for cancellation requests received prior to May 19, 1989. No requests for refunds can be accepted after that date.

For additional information, contact Professor K. (Cheena) Srinivasan at (614) 292-0503 or Julia Mills, Conferences & Institutes at (614) 292-8571.

### TO REGISTER

Complete and return the registration form with the proper fee. Checks, money orders or purchase orders should be made payable to The Ohio State University. A letter of authorization from the employing organization must be included with a request for billing. All payments must be in U.S. currency. Send registration and payment to: NAMRC XVII, OSU Conferences & Institutes, Box 21878, Columbus, Ohio 43221 USA. Registrations will be taken by telephone at (614) 292-4230 if MasterCard or VISA is used.

### FURTHER INFORMATION

For additional conference information, please call Julia Mills at (614) 292-8571 or Professor K. (Cheena) Srinivasan at (614) 292-0503. For questions regarding registration, call (614) 292-4230. During the conference, incoming messages for conference attendees will be accepted at (614) 292-3238 and will be posted on a bulletin board near the registration area.

# TECHNICAL SESSIONS AND PROGRAM

## TUESDAY, MAY 23

5:00 p.m.-8:00 p.m.

**REGISTRATION AND RECEPTION**  
Fawcett Center

**NAMRI/SME BOARD OF  
DIRECTORS MEETING** Fawcett Center

## WEDNESDAY, MAY 24

8:00 a.m.-8:45 a.m.

**REGISTRATION** Fawcett Center

8:45 a.m.-10:00 a.m.

**GENERAL SESSION** Fawcett Center

### WELCOMING REMARKS

*J.M. Hollander*, Vice President for Research and Graduate Studies,  
The Ohio State University  
*D.D. Glower*, Dean, College of Engineering, The Ohio State  
University

### INTRODUCTORY REMARKS

*A.T. Male*, NAMRI/SME President, Westinghouse Electric Co.,  
Pittsburgh, PA

### KEYNOTE ADDRESS

**"Manufacturing Engineering to Achieve Customer  
Satisfaction,"**

*Ryuichi Tsukamoto*, President, Honda Engineering North America,  
Marysville, OH

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

### COFFEE BREAK

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

**SESSION 1** Fawcett Center

- A. Co-Chairmen: *G.D. Lahoti*, The Timken Co., Canton, OH and *R. Shivpuri*, The Ohio State University, Columbus, OH
1. "Computer Modeling of Flow Lines in Metal Forming Processes," *J.S. Gunasekera* and *N.V. Hallangady*, Ohio University, Athens, OH
  2. "Viscoplasticity Analysis of Aluminum Extrusion Aided by Image Processing," *M. Murakawa*, *N. Koga*, and *S. Yanagimoto*, Nippon Institute of Technology, Japan, and *M. Tomita*, Industrial Research Institute of Kanagawa Prefecture, Japan
  3. "The Use of a Finite Element Model to Simulate Plastic Deformation in a Long Thin Copper Wire," *D.R. Hamilton*, Royal Military College of Canada, Kingston, Ontario, Canada, and *W.B. Rice*, Queen's University, Kingston, Ontario, Canada
- B. Co-Chairmen: *J.T. Black*, Auburn University, Auburn, AL and *R. Komanduri*, National Science Foundation, Washington, DC
1. "Prediction of Built-Up Edge Formation in Orthogonal Cutting of Aluminum," *D.H. Howerton*, *J.J. Strenkowski*, and *J.A. Bailey*, North Carolina State University, Raleigh, NC

- B. Co-Chairmen: *D. Bray*, Ingersoll Milling Machine Co., Rockford, IL and *J. Tlustý*, University of Florida, Gainesville, FL
1. "A System for On-Line Detection and Prediction of Catastrophic Tool Failure in Milling," *F. Richter* and *S.A. Spiewak*, University of Wisconsin-Madison, Madison, WI
  2. "An Algorithm for the Detection of Flute Breakage in a Peripheral End Milling Process," *J.W. Sutherland*, *D.J. O'Brien*, and *M.S. Wagner*, University of Illinois at Urbana-Champaign, Urbana, IL
  3. "End Mill Cutter Engagement Determination from CNC Tool Trajectories for Planar Surface Generation," *S.N. Melkote* and *L.A. Kendall*, Washington State University, Pullman, WA
- C. Co-Chairmen: *O. Masory*, Florida Atlantic University, Boca Raton, FL and *P. Cohen*, Pennsylvania State University, University Park, PA
1. "A Computationally Efficient Interpolator for Robotic Manipulators," *S.J. Lym* and *K.F. Eman*, Northwestern University, Evanston, IL
  2. "A New Path Generation Method by Using Interpolation of Orientation in Robotic Trajectory," *K. Kim* and *S.S. Kim*, University of Illinois at Chicago, Chicago, IL
  3. "The Design of a Self-Propelled Mobile Robot," *M. Lawley*, University of Alabama, Gadsden, AL, and *J.T. Black*, Auburn University, Auburn, AL

6:00 p.m.

**COCKTAILS** Confluence Park Restaurant

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

**CONFERENCE BANQUET**  
Confluence Park Restaurant

## THURSDAY, MAY 25

8:30 a.m.-10:00 a.m.

**SESSION 4** Fawcett Center

- A. Chairman: *A.T. Male*, Westinghouse Electric Corp., Pittsburgh, PA
- "Recent Developments and Trends in Forming Research and Technology"**  
Informal presentations will be made on recent progress and future developments in forming. Interested participants should contact *Rajiv Shivpuri* (614) 292-7874 or *Yong Taek Im* (614) 292-4342. Industry representatives are especially encouraged to participate.
- B. Co-Chairmen: *J.A. Kovach*, Eaton Corp., Willoughby Hills, OH and *A. Thangaraj*, Michigan Technological University, Houghton, MI
1. "Tool Wear Monitoring and Milling Operations Using DDS Methodology," *B. Szabo*, Computer and Automation Institute, Budapest, Hungary, *R. Du* and *S.M. Wu*, University of Michigan, Ann Arbor, MI
  2. "Tool Wear Models and Estimation," *T-R Ko* and *Y. Koren*, University of Michigan, Ann Arbor, MI
  3. "A Study on Residual Stresses and Tool Wear Induced by Machining Processes," *Q. Xie*, *A.E. Bayoumi*, *L.A. Kendall* and *G.L. Sheldon*, Washington State University, Pullman, WA
- C. Co-Chairmen: *C.H. Meng*, The Ohio State University, Columbus, OH and *C.L. Wu*, Ford Motor Co., Dearborn, MI
1. "Self-Sustaining, Open-System Machine Tools," *I. Greenfeld*, *F.B. Hansen*, and *P.K. Wright*, New York University, New York, NY
  2. "Computer-Aided Testing and Diagnostic Systems of the Manufacturing Processes by Using the Coordinate Measuring Machine," *S. Kanai*, *R. Kawamura*, *T. Kishinami*, and *K. Saito*, Hokkaido University, Sapporo, Japan
  3. "Design and Implementation of a Modular Multi-Processor System (MMPS) for Machine Monitoring and Diagnostics," *F.Z. Shen*, *J. Ni*, and *S.M. Wu*, University of Michigan, Ann Arbor, MI

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

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

**NAMRI/SME LUNCHEON** Fawcett Center

1:30 p.m.-3:00 p.m.

**SESSION 6** Fawcett Center

- A. Co-Chairmen: *K. Lange*, University of Stuttgart, Stuttgart, West Germany and *S.I. Oh*, Battelle Laboratories, Columbus, OH
1. "Hydroforming of Regular Polygonal Boxes," *J. Tirosh* and *H. Segal*, Technion I.I.T., Haifa, Israel, and *S. Yossifon*, N.R.C.N., Beer Sheva, Israel
  2. "Experimental Study of Influence of Roll Shape and Back Tension on In-Plane Bending by Wedge Rolling," *O. Yamada*, *M. Murakami*, and *M. Takasaki*, Hitachi, Ltd., Yokohama, Japan
  3. "A Numerical Solution of Steckel Rolling Using Measured Boundary Conditions," *H.Y. Lee* and *R.S. Rao*, University of Michigan, Ann Arbor, MI
- B. Co-Chairmen: *G. Chryssolouris*, Massachusetts Institute of Technology, Cambridge, MA and *J. Kohls*, Institute for Advanced Manufacturing Sciences, Cincinnati, OH
1. "Laser Machining of Mechanically Difficult-to-Machine Superalloy," *P.A. Molian* and *J.L. Lee*, Iowa State University, Ames, IA
  2. "A Study on Laser Cutting of Glass Plate," *K. Yamazaki*, Toyohashi University of Technology, Toyohashi, Japan and *H. Kanematsu*, Yamazaki Mazak Corp., Japan
  3. "CFRP (Carbon Fiber Reinforced Plastics) Cutting Mechanism," *T. Kaneeda*, Okayama University of Science, Okayama, Japan
  4. "Surface Texture in Abrasive Waterjet Cutting," *R. Kovacevic*, Syracuse University, Syracuse, NY
- C. Co-Chairmen: *P. Ferreira*, University of Illinois at Urbana-Champaign, Urbana, IL and *J.J. Shah*, Arizona State University, Tempe, AZ
1. "A Structure for Supporting Geometric Tolerances for Computer Integrated Manufacturing," *J.J. Shah* and *D. Miller*, Arizona State University, Tempe, AZ
  2. "Position Tolerance of a Single Hole Regardless of Feature Size," *E.A. Lehtihel* and *N.U. Gunasena*, Pennsylvania State University, University Park, PA
  3. "An Analysis of the Effect of Position Tolerance on the Performance of a Robot for a Loose Fastener Assembly," *S.H. Kim* and *K. Knott*, Pennsylvania State University, University Park, PA

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

**REFRESHMENT BREAK**

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

**TOURS OF DEPARTMENTAL AND  
ERC/NSM LABORATORIES**

5:00 p.m.

**WINE AND CHEESE RECEPTION** Fawcett Center

6:00 p.m.

**NAMRI/SME MEMBERSHIP  
MEETING** Fawcett Center

8:00 p.m.

**ASME PRODUCTION ENGINEERING  
DIVISION EXECUTIVE COMMITTEE  
MEETING** Fawcett Center  
**DINNER ON YOUR OWN**

**FRIDAY, MAY 26**

