

The North American Manufacturing Research Institution of
the Society of Manufacturing Engineers Announces its...

NINETEENTH NORTH AMERICAN MANUFACTURING RESEARCH CONFERENCE

NAMRC XIX
MAY 22-24, 1991



The University of Missouri—Rolla
Rolla, Missouri USA



NAMRI 

North American Manufacturing Research Institution
of the Society of Manufacturing Engineers

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NINETEENTH NORTH AMERICAN MANUFACTURING RESEARCH CONFERENCE—NAMRC XIX

REGISTRATION AND GENERAL INFORMATION



NAMRC XIX CONFERENCE PROSPECTUS

The Nineteenth North American Manufacturing Research Conference (NAMRC XIX), to be held May 22-24, 1991, is designed to provide a forum for the timely presentation and critical discussion of the results of basic and applied research in material forming, material removal, and manufacturing systems/automation. All papers presented at the conference are contained in the bound volume titled "Transactions of the North American Manufacturing Research Institution of SME—1991." These papers have been accepted based upon a review of full length submissions and highlight manufacturing research efforts from universities, centers, and companies from around the world.

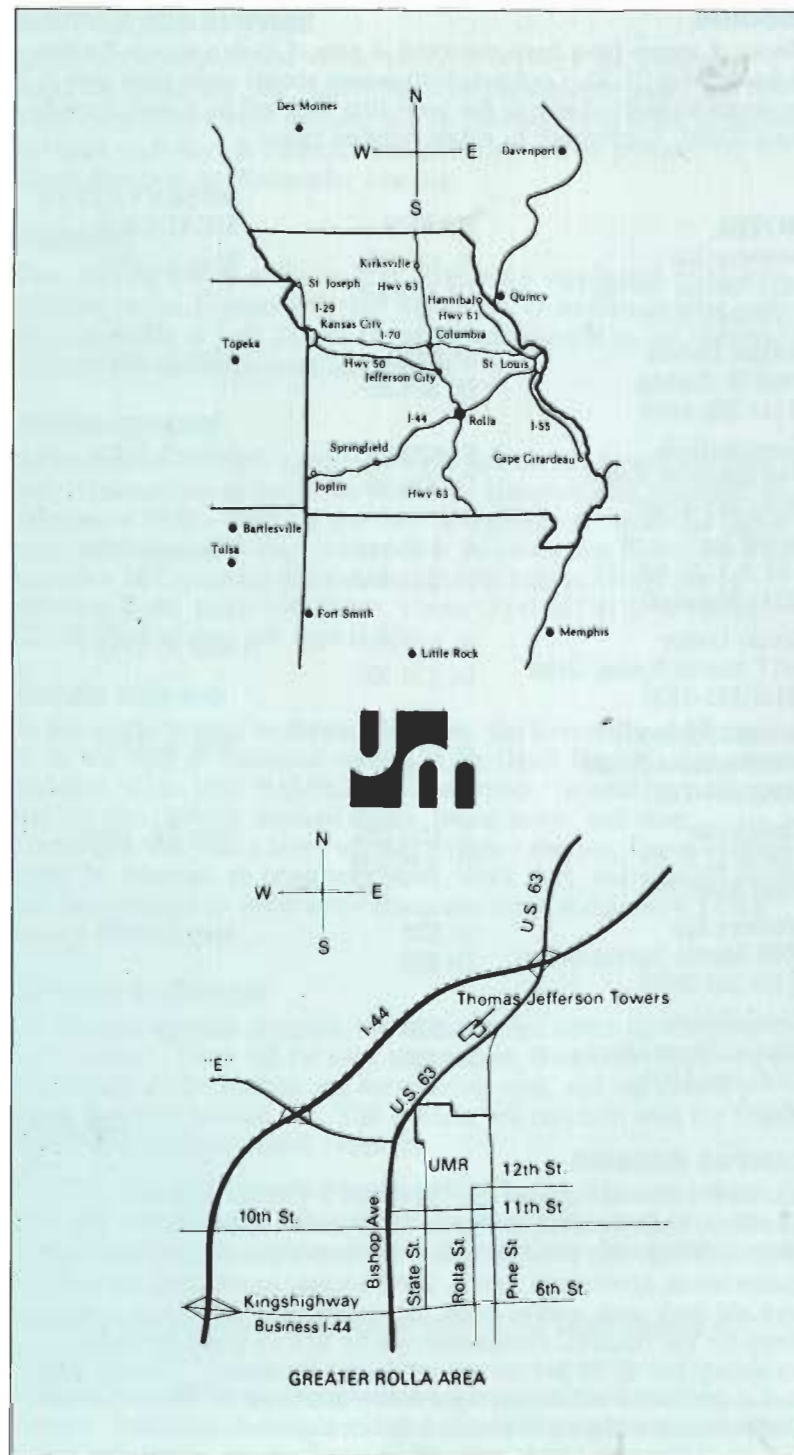
The conference will feature three parallel sessions in material forming, material removal, and manufacturing systems. The sessions will include formal presentations of the papers and a discussion period following each presentation. In addition, there will be a general keynote address, several "open but structured" interaction sessions, and two sessions focused on various aspects of university/industry interaction.

CONFERENCE LOCATION AND TRANSPORTATION (See Maps)

The conference will be held at the University of Missouri-Rolla, which is located in Rolla, Missouri, a small university town located 105 miles southwest of St. Louis and 110 miles northeast of Springfield, Missouri. Lying in the northern foothills of the Ozark Mountains, Rolla is in a beautifully scenic area and is easily accessible. Interstate-44 runs from St. Louis through Rolla to the southwest (old U.S. 66). U.S. Highway 63 passes through Rolla in a north-south direction, and Missouri Highway 72 terminates in Rolla from the southeast.

The easiest way to reach Rolla from distant points is through Lambert-St. Louis Airport. Bus service (Greyhound) from the Airport to Rolla is direct, with busses departing the airport at 8:10 a.m., 2:30 p.m., 7:05 p.m., 8:20 p.m., and 11:20 p.m. To supplement this schedule, a university bus or van will depart from the lower level of the airport (by the baggage claim area) at 4:30 p.m. on Tuesday afternoon, May 21, 1991. Please note your desire to use this service on your registration form.

Those wishing to drive from the airport to Rolla will find the 110 miles to be all Interstate highway. Upon leaving the airport, take I-70 west approximately 5 miles to the junction of I-270. Take I-270 south, approximately 15 miles to the junction of I-44 (exit labeled Tulsa). Exit onto I-44 west and proceed to Rolla.



LODGING

Blocks of rooms have been reserved at nine of Rolla's motels for the nights of May 21-23. Conference attendees should make their own reservations and indicate to the hotel that they will be a participant in the NAMRC Conference to obtain reduced rates.

| MOTEL | RATES | RESERVATION DEADLINE |
|---|------------------------------|----------------------|
| Bestway Inn 1631 Martin Spring Dr. (314) 341-2158 | S: \$20-\$24 D: \$27-\$30 | May 1, 1991 |
| Budget Deluxe 1908 N. Bishop (314) 364-4488 | S: \$22 D: \$24.95 | May 1, 1991 |
| Daystop-Rolla I-44 Business Route (314) 341-3700 | S: \$29.95 D: \$34.95 | May 1, 1991 |
| Drury Inn I-44 & U.S. 63 (314) 364-4000 | S: \$37-\$44 D: \$44-\$48 | May 18, 1991 |
| Econo Lodge 1417 Martin Spring Drive (314) 341-3130 | S: \$27.95 D: \$34.95 | May 1, 1991 |
| Howard Johnson's I-44 Business Route (314) 364-7111 | S: \$34 D: \$46 | May 1, 1991 |
| Thrifty Inn I-44 & U.S. 63 (314) 364-1333 | S: \$20-\$25 D: \$25-\$32 | May 18, 1991 |
| Western Inn 1605 Martin Spring Drive (314) 341-3050 | S: \$26 D: \$32 | May 1, 1991 |
| Zeno's Motel Martin Spring Drive (314) 364-1301 | S: \$29 D: \$38 | May 1, 1991 |

CAMPUS HOUSING

Rooms are also available in the University's Thomas Jefferson Residence Hall. Located just three short blocks from campus, this two-tower high rise structure offers dormitory accommodations, large lounge areas, conference rooms, game rooms, an attached outdoor pool and deck area, a large patio, air conditioning, and ample parking. Rates for the NAMRC Conference will be \$14.75 a day for single occupancy and \$9.90 per person for double occupancy. Towels, washcloths, and linens will be provided for an additional \$2.70 per person. Washrooms are limited to common facilities on each corridor.



SHUTTLE BUS SERVICE

University transportation will be provided between the Thomas Jefferson Residence, the motels listed on the opposite page, and the University Center each morning and at the conclusion of the afternoon sessions each day. In addition, transportation will be provided for the Ozark Bar-B-Q on Wednesday evening.

PARKING

Free parking will be available at all conference motels and in the lots adjacent to the Thomas Jefferson Residence. In addition, visitor parking is available in Lots 21 and 17, which are adjacent to the University Center. No special permits are needed.

TRANSACTIONS

All registered NAMRC participants will receive one hardbound copy of the "Transactions of the North American Manufacturing Research Institution of SME—1991" at the time of registration. Additional copies may be purchased at the conference or by contacting Walter Ries, Coordinator of Continuing Education, 119 ME Annex, University of Missouri-Rolla, Rolla, MO 65401, Phone (314) 341-4132 or 1(800) 752-5057. The cost per copy is \$65.

OZARK BAR-B-Q

In lieu of the normal conference banquet, the University of Missouri-Rolla will offer an enhanced version of the Ozark-Bar-B-Q that was the highlight of the 1980 NAMRC VIII Conference. In addition to all-you-can-eat ribs, hickory smoked meats, baked beans, and other trimmings, this year's feast will also include roast pig. Dress will definitely be informal, so bring your jeans, work shirt, and stompin' boots and be prepared to enjoy some bluegrass music and genuine Ozark square dancing.

SPOUSE PROGRAM

An informal spouses program will be conducted under the direction of Barb Kohser. Plans call for local activities on Wednesday, focusing on the history of the campus and surrounding area, and will include a lunch at a local historic site. The evening will conclude with the Ozark Bar-B-Q (additional tickets required).

On Thursday, the group will travel to St. Charles, Missouri, where they will tour Missouri's first capital, the numerous shops along the restored waterfront, and the antique-shoppers' paradise in old Frenchtown.

A Friday morning tea/brunch will be offered for those wishing to attend.

A fee of \$40 will cover transportation, admissions, and the Friday brunch. Other meals are not included. To facilitate planning and scheduling, registration for the Spouses' Program should be made in ad-

vance. Please complete the appropriate section on the registration card, including the name of the participant.

For those individuals who might desire babysitting/child care, a listing of possible providers will be available upon request. Individual arrangements and compensation will be required.

CONFERENCE FEES

Registration fees for NAMRC XIX are \$265 (U.S. currency) for advance registration and \$275 (U.S. currency) for on-site registration. This fee includes admission to all sessions, a bound copy of the 1991 Transactions of NAMRI/SME, refreshments, two luncheons, and the Ozark-Bar-B-Q. There will be no one-day registration fees or reduced fees for authors or session chairmen.

Students and retirees will be admitted to the conference for \$95. This fee is a special rate to encourage attendance and includes entrance to all sessions, refreshments, and meals. Bound copies of the conference Transactions can be purchased at the member price of \$65.

Extra lunch tickets for May 22 and 23 will be available for \$10 each. Additional tickets for the Ozark Bar-B-Q on May 22 are \$20 each. Please indicate your desire for additional meal tickets on the registration form.

Full refunds will be extended for cancellations received prior to May 8, 1991. After this date, no refunds will be extended.

TO REGISTER

Complete and return the registration form with the proper fee. Checks, money orders, or purchase orders should be made payable to the University of Missouri-Rolla. All payments must be in U.S. currency. Send registration and payment to: Walter Ries, Coordinator of Continuing Education, 119 ME Annex, University of Missouri-Rolla, Rolla, MO 65401. Registration material can be sent via FAX to (314) 341-4992.

FOR FURTHER INFORMATION

For additional information regarding papers, sessions, meetings, etc., call Dr. Ronald A. Kohser at (314) 341-4734. For questions regarding registration, housing, and transportation, call Walter Ries, Coordinator of Continuing Education at (314) 341-4132 or 1(800) 752-5057. For additional information regarding the Spouses' Program, call Barb Kohser at (314) 341-3833 after 5:00 p.m. CST. During the conference, incoming messages for attendees will be accepted at (314) 341-4924 and will be posted on a bulletin board near the meeting rooms.



NAMRC XIX Technical Program and Sessions

TUESDAY, MAY 21

5:00 p.m.-7:00 p.m.

REGISTRATION AND RECEPTION Miner Lounge, University Center East

7:00 p.m.

NAMRI/SME Board of Directors Dinner Silver and Gold Room, University Center East

8:00 p.m.

NAMRI/SME Board of Directors Meeting Silver and Gold Room, University Center East

WEDNESDAY, MAY 22

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

REGISTRATION Miner Lounge, University Center East

8:30 a.m.-9:00 a.m.

OPENING SESSION Mechanical Engineering Auditorium

OPENING REMARKS

R.A. Kohser, Chairman, NAMRC XIX Organizing Committee

WELCOMING REMARKS

Martin Jischke, Chancellor, University of Missouri-Rolla
Robert L. Davis, Dean of Engineering, University of Missouri-Rolla

INTRODUCTORY REMARKS

D.A. Dornfeld, NAMRI/SME President, University of California-Berkeley

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

KEYNOTE PRESENTATIONS

"National Strategy for Industrial Base Modernization,"
Mr. Leo Reddy, President, National Coalition for Advanced Manufacturing (NACFAM), Washington, D.C.

"The Small Business Perspective—What it Takes to be Competitive,"
Mr. Michael Wicklund, President, Missouri Forge, Doniphan, Missouri

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

COFFEE BREAK Miner Lounge, University Center East

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

SESSION 1

SESSION F-1 Mark Twain Room

Co-Chairmen: J. Story, Alcoa Laboratories
J. Gunasekera, Ohio University

F-1-1: "Rigid Viscoplastic Tapered Compression with Microhardness as an Internal State Variable," Y.C. Shiau, V.P. Ravi and C.K. Fong, Oklahoma State University, Stillwater, OK.

F-1-2: "Ideal Manufacturing Method for Special End Nibbed Compression Helical Spring," S.R. Bhonsle, C.V. Van Karsen and J.R. Michler, Michigan Technological University, Houghton, MI.

F-1-3: "Computer Aided Manufacturing for Three-Dimensional Tube Bending with On-Line Springback Compensation," W.C. Wang and K.A. Stelson, University of Minnesota, Minneapolis, MN.

SESSION M-1 Centennial Hall East

Co-Chairmen: W. Zdeblick, Center for Manufacturing and Machine Tool Technology, IAMS
K. Srinivasan, Ohio State University

M-1-1: "Thermo-Viscoplastic Finite Element Modeling of Machining Under Various Cutting Conditions," K.F. Eldridge, O.W. Dillon and W.Y. Lu, University of Kentucky, Lexington, KY.

M-1-2: "Prediction of Shear Angle Using Minimum Energy Principle and Strain Softening," F.C. Appl, Kansas State University, Manhattan, KS, and Shaik Saleem, Kumar Industries, Walnut, California.

M-1-3: "An Investigation of Three-Dimensional Chip Flow in Machining Steels with Grooved Chip Forming Tool Inserts," I.S. Jawahir, University of Kentucky, Lexington, KY.

M-1-4: "A Study on Micro Orthogonal Machining of Single Crystal Copper," T. Moriwaki, K. Manabe and K. Iwata, Kobe University, Kobe, Japan.

SESSION S-1 Centennial Hall West

Co-Chairmen: P. Cohen, Pennsylvania State University
A. Okafor, University of Missouri-Rolla

S-1-1: "An Integrated Process Planning and In-Process Control System for Sculptured Surface Production," M.L. Philpott, University of Illinois at Urbana-Champaign, Urbana, IL, W.R. Dinauer, Y. Yamada and N.A. Duffie, University of Wisconsin-Madison, Madison, Wisconsin.



S-1-2: "Concurrent Process Planning for Machining and Inspection of Sculptured Surfaces," H-T Yau and C-H Menq, Ohio State University, Columbus, OH.

S-1-3: "Improving Contouring System Accuracy by Two-Stage Actuation," O. Masory and J. Wang, Florida Atlantic University, Boca Raton, FL.

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

LUNCHEON Rayl Cafeteria, University Quadrangle Dormitories

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

SESSION 2

SESSION F-2 Mark Twain Room

Panel Discussion: "University-Industry Interaction: The Business Perspective"

Chairman: H.D. Keith, University of Missouri-Rolla

Panel Members:

J. Jablonowski, American Machinist

J. Dowd, Dowd Associates

A. Sabroff, Eaton Corporation

M. Wicklund, Missouri Forge & Forging Industry Association

SESSION M-2 Centennial Hall East

Co-Chairmen: W. DeVries, Rensselaer Polytechnic University
A. Bayoumi, Washington State University

M-2-1: "An Approach to On-Line Cutter Runout Estimation in Face Milling," F. Gu, S.G. Kapoor and R.E. DeVor, University of Illinois at Urbana-Champaign, Urbana, IL, and P. Bandyopadhyay, General Motors Research Laboratories, Warren, Michigan.

M-2-2: "Control of Radial Runout of Multi-Tool Face Milling," T-C. Tsao and K-C Pong, University of Illinois at Urbana-Champaign, Urbana, IL.

M-2-3: "High Speed Machining of α - β Titanium with Ultra-High Pressure Lubrication/Cooling Through the Insert," R.R. Lindeke, University of Minnesota, Duluth, Minnesota, F.C. Schoenig Jr., A.K. Khan and J. Haddad, Cleveland State University, Cleveland, OH.

SESSION S-2 Centennial Hall West

Co-Chairmen: J. Gerdeen, University of Colorado-Denver
C. Dagli, University of Missouri-Rolla

S-2-1: "Design and Development of an Integrated CAD/CAPP/CAM Machining System for Prismatic Parts," R.L. Sakal and J.G. Chow, Clarkson University, Potsdam, NY.

S-2-2: "Data Base Implementation to Extract Geometric Features from CAD System's Part Data," L.M. Rosario, University of Puerto Rico at Mayaguez, Mayaguez, Puerto Rico, and W.A. Knight, University of Rhode Island, Kingston, Rhode Island.

S-2-3: "Three Dimensional Printing: Rapid Tooling and Prototypes Directly from CAD Representation," E. Sachs, M. Cima, J. Cornie, D. Brancazio, J. Bredt, A. Curodeau, M. Esterman, T. Fan, C. Harris, K. Kremmin, S.J. Lee, B. Pruitt and P. Williams, Massachusetts Institute of Technology, Cambridge, MA.

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

COFFEE BREAK Miner Lounge, University Center East

3:30 p.m.-5:00 p.m.

SESSION 3



SESSION F-3 Mark Twain Room

Panel Discussion: "University-Industry Interaction: The University View"

Chairman: A. T. Male, Westinghouse Research

Panel Members:

T. Altan, Ohio State University

R. Komanduri, Oklahoma State University

D. Dornfeld, University of California-Berkeley

H.D. Keith, University of Missouri-Rolla

SESSION M-3 Centennial Hall East

Co-Chairmen: S. Ramalingam, University of Minnesota

A. Thangaraj, Michigan Technological University

M-3-1: "Conical, Cylindrical and Planar Twist Drill Points—Modeling and Grinding," C. Lin and Z-Q. Cao, Hunan University, P.R. China.

M-3-2: "Turning Precision Threads on Heat Treated Alloy Steels," D.W. Yen, General Motors Technical Center, Warren, MI.

M-3-3: "An Investigation of the Cutting Mechanisms in Drilling Cast Iron: Evaluation of Advanced Drill Body and Point Geometries," J.S. Agapiou, General Motors Technical Center, Warren, MI.

SESSION S-3 Centennial Hall West

Co-Chairmen: K. Nyamekye, Auburn University

W. Lu, University of Missouri-Rolla

S-3-1: "An Assembly Recognition Algorithm for Automatic Tolerancing," O. Eyada and J.B. Ong, Virginia Polytechnic Institute and State University, Blacksburg, VA.

S-3-2: "Probabilistic Reliability Analysis for Position, Velocity, and Acceleration of Planar Robots for High Speed Assembly Operations," S.J. Lee, Korea Productivity Center, Seoul, Korea, and B.J. Gilmore, Pennsylvania State University, University Park, PA.

S-3-3: "Multivariate Analysis and Variation Reduction Case Studies for Automobile Assembly," S. Hu, S-K. Wu and S.M. Wu, University of Michigan, Ann Arbor, MI.

6:00 p.m.-9:00 p.m.

OZARK BAR-B-Q Rolla Lion's Club Park, U.S. Hwy. 63 South

THURSDAY, MAY 23

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

SESSION 4

SESSION F-4 Mark Twain Room

Co-Chairmen: S-I. Oh, Battelle Columbus Laboratories

K. Weinmann, Michigan Technological University

F-4-1: "Analytical Modelling of the Pack Rolling Process," A.F. Ali, A. Rathinavel and J.S. Gunasekera, Ohio University, Athens, OH, and W. Kerr, Wright Patterson Air Force Base, Dayton, OH.

F-4-2: "Three-Dimensional Coupled Simulation of Strip and Shape Rolling Processes," J. Yanagimoto and M. Kiuchi, University of Tokyo, Tokyo, Japan.

F-4-3: "Non-Steady State Simulation of Three-Dimensional Deformation around Front and Rear Ends in Shape Rolling by the Finite Element Method," K. Mori and K. Osakada, Osaka University, Osaka, Japan.

SESSION M-4 Centennial Hall East

Co-Chairmen: R. DeVor, University of Illinois at Urbana-Champaign

D. Durham, University of Vermont

M-4-1: "Vibrations of a Filamentary Brush in Contact with a Solid Roll," J.H. Heo and K.F. Ehmman, Northwestern University, Evanston, IL.

M-4-2: "Diagnosis of Faults with Thin-film Sensors in a Multiple-Spindle Drilling Head," C. Nedess and M. Schwedler, Technische Universitat Hamburg-Harburg, Hamburg, Germany.

M-4-3: "Machining Condition Monitoring by an X-Ray Diffraction Method," Y.C. Shin and S.J. Oh, Purdue University, West Lafayette, IN, and C.O. Ruud, The Pennsylvania State University, University Park, PA.

SESSION S-4 Centennial Hall West

Co-Chairmen: G. Chryssolouris, Massachusetts Institute of Technology

D. Dornfeld, University of California-Berkeley

S-4-1: "Optical Gaging of Very Short-Term Surface Waviness," P.P. Lin, F. Parvin and F.C. Schoenig, Cleveland State University, Cleveland, OH.

S-4-2: "Tolerances and Function in Concurrent Product and Process Design," R.G. Wilhelm and S.Y-C. Lu, University of Illinois at Urbana-Champaign, Urbana, IL.

S-4-3: "Feature-Based Analysis of Mechanical Constraint," S.E. Koyluoglu and W.R.D. Wilson, Northwestern University, Evanston, IL.

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

COFFEE BREAK Miner Lounge, University Center East

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

SESSION 5



SESSION F-5 Mark Twain Room

"Open" Session on Metal Forming Research

Session Moderator: R. Kohser, University of Missouri-Rolla

This session is dedicated to the presentation of recent breakthroughs, unpublished industrial research activity, and work in-progress, as well as requests for suggestions or assistance and the dispersal of information relating to new research programs and opportunities. Presentations will be limited to 10 minutes each. Those wishing to make a presentation should contact Dr. Ronald Kohser at (314) 341-4734 to make their request. NOTE: This is NOT a forum for the presentation of unaccepted papers!

SESSION M-5 Centennial Hall East

Co-Chairmen: K. Ehmann, Northwestern University

K. Rajurkar, University of Nebraska

M-5-1: "Modeling and Estimation of Quasistatic Machine-Tool Errors," V.S.B. Kiridena and P.M. Ferriera, University of Illinois at Urbana-Champaign, Urbana, IL.

M-5-2: Statistical Reliability of Cutting Tools: Continuous Cutting Conditions," S. Santhanam and S. Mayasandra, Villanova University, Villanova, PA.

M-5-3: "A Neural Network Approach to Drilled Hole Quality Monitoring Based on Machine Spindle Vibrations," R.P. Barton and A.R. Thangaraj, Michigan Technological University, Houghton, MI.

SESSION S-5 Centennial Hall West

"Open" Session on Manufacturing Systems Research

Session Moderator: L.A. Kendall, University of Minnesota-Duluth

This session is dedicated to the presentation of recent breakthroughs, unpublished industrial research activity, and work in-progress, as well as requests for suggestions and assistance and the dispersal of information relating to new research programs and opportunities. Presentations will be limited to 10 minutes each. Those wishing to make a presentation should contact Dr. Ronald Kohser at (314) 341-4734 to make their request. NOTE: This is NOT a forum for the presentation of unaccepted papers!

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

NAMRI/SME LUNCHEON Rayl Cafeteria, University Quadrangle: Dormitories

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

SESSION 6

SESSION F-6 Mark Twain Room

Co-Chairmen: T. Altan, Ohio State University

A. Sabroff, Eaton Corporation

F-6-1: "Boundary Friction Measurements Using a New Sheet Metal Forming Simulator," W.R.D. Wilson, H.G. Malkani and P.K. Saha, Northwestern University, Evanston, IL.

F-6-2: "A Frame-Based Representation for the Design of Sheet Metal Parts," J. Wang and W.R.D. Wilson, Northwestern University, Evanston, IL.

F-6-3: "Buckling Stiffness of Car Roofs After Forming," J.C. Gerdeen, J.B. Wetterdal and M. Heuser, University of Colorado at Denver, Denver, CO.

SESSION M-6 Centennial Hall East

Co-Chairmen: V. Venkatesh, Tennessee Technological University

D. Blaser, General Motors Research Laboratories

M-6-1: "Optimization of Ceramics Lapping," C. Chen, Mechanical Industry Research Laboratories, Taiwan, Republic of China, and I. Inasaki, Keio University, Yokohama, Japan.

M-6-2: "Cutting Performance of a Nd/YAG Laser Alloyed Carbon Tool Steel with Ti/BN," G.H. Shehata and P.A. Molian, Iowa State University, Ames, IA.

M-6-3: "Cup-Wheel Grinding of Ceramic Cutting Tools," H.K. Tonshoff and H.G. Wobker, Institute for Production Engineering, Hannover, Germany.

M-6-4: "Tribological Aspects of Interrupted Cutting with Ceramic Tool Materials," H.K. Tonshoff and B. Denkena, Institute for Production Engineering, Hannover, Germany.

SESSION S-6 Centennial Hall West

Co-Chairmen: W. Knight, University of Rhode Island

G. Wiens, Auburn University

S-6-1: "Concept of the Structured, Workshop-Specific Analysis and Reorganization of the Tool Management with Regard to the Integrated Tool Management," A. Romberg, R. Homscheid, C. Schulz and G. Warnecke, University of Kaiserslautern, Kaiserslautern, Germany.

S-6-2: "On-Line Monitoring of Tool Breakage with Unsupervised Neural Networks," I.N. Tansel, Florida International University, Miami, FL, and C. McLaughlin, Tufts University, Medford, Massachusetts..



S-6-3: "A Statistical Approach to Sensor Synthesis," G. Chryssoulouris, M. Domroese, and P. Beaulieu, Massachusetts Institute of Technology, Cambridge, MA.

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

COFFEE BREAK Miner Lounge, University Center East

3:30 p.m.-5:00 p.m.

INDUSTRY TOUR

Tour of manufacturing laboratories at the University of Missouri-Rolla

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

WINE AND CHEESE RECEPTION Miner Lounge, University Center East

6:00 p.m.

NAMRI/SME MEMBERSHIP MEETING Centennial Hall East

7:00 p.m.

ASME PRODUCTION ENGINEERING DIVISION MEETING

Mark Twain Room

Please note that this meeting will start immediately following the NAMRI/SME Membership Meeting.

DINNER ON YOUR OWN

A listing of local restaurants and their fare will be provided.

FRIDAY, MAY 24

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

SESSION 7

SESSION F-7 Mark Twain Room

Co-Chairmen: C. VanTyne, Colorado School of Mines
G. Lahoti, Timkin Company

F-7-1: "Admissible Velocity Field for the Upsetting of Cylindrical Workpieces," Z.H. Cai and G.E.O. Widera, University of Illinois at Chicago, Chicago, IL.

F-7-2: "Image Analysis Applications in Metal Forming Research," S.A. Majlessi and K.J. Weinmann, Michigan Technological University, Houghton, MI.

F-7-3: "Coupled Thermo-Mechanical Analysis of Hot Metal Processes: Further Improvements," N. Alberti, L. Cannizzaro and F. Micari; University of Palermo, Palermo, Italy.

SESSION M-7 Centennial Hall East

Co-Chairmen: R. Komanduri, Oklahoma State University
S. Kapoor, University of Illinois at Urbana-Champaign

M-7-1: "Detection of Abrasive Waterjet Nozzle Wear by Using Tim Series Modeling Technique," R. Kovacevic, University of Kentucky, Lexington, Kentucky.

M-7-2: "Computer Modeling and Graphical Simulation of EDM Tool Design," G.B. Gorjala, K.P. Rajurkar and V.K. Jain, University of Nebraska-Lincoln, Lincoln, NB.

M-7-3: "Monitoring and Control Strategy for Wire Breakage in WEDM," W.M. Wang, K.P. Rajurkar and Y.H. Huang, University of Nebraska-Lincoln, Lincoln, NB.

SESSION S-7 Centennial Hall West

Co-Chairmen: J. Nazemetz, Oklahoma State University
S. Lu, University of Illinois at Urbana-Champaign

S-7-1: "Feasibility Study of a Self-Propelled Mobile Robot in an Unmanned Manufacturing Cell," Y.T. Wang, G.J. Wiens and JT. Black, Auburn University, Auburn, AL.

S-7-2: "Dynamic Analysis of an Air Pallet Mobile Robot," G.J. Wiens and C-F. Lin, Auburn University, Auburn, AL.

S-7-3: "Performance Evaluation of a Routing Algorithm for AGV Systems," J. Huang and U.S. Palekar, University of Illinois at Urbana-Champaign, Urbana, IL.

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

COFFEE BREAK Miner Lounge, University Center East

ADJOURNMENT

OPTIONAL PLANT TOUR

University transportation will leave Rolla at 11:00 a.m. for the Chrysler Assembly Plant #2 in Fenton, Missouri. This plant assembles the extended-wheel-base minivans (Dodge Caravan/Plymouth Voyager) and offers state-of-the-art manufacturing systems technology. It is located approximately 75 miles northeast of Rolla, along Interstate 44, conveniently along the way to the Lambert-St. Louis airport. With a stop for lunch along the way, the tours will begin between 1:00 and 1:30 p.m. and will conclude in time to assure arrival at the airport by 4:00 p.m. Attendees can use either University or personal transportation, but should note their interest in the tour on the registration form so that adequate plans can be made.

NOTES



ADVANCE REGISTRATION FORM

NAMRC XIX

**May 22-24, 1991
University of Missouri-Rolla**

Please print or type:

Last Name _____ First Name _____ Middle Initial _____

Company or Organization _____

Business Address (number and street or box number) _____

City _____ State _____ Zip Code _____

Business Telephone () _____

Indicate Your Fee:

- _____ Advance Registration Fee \$265 (includes luncheons, Bar-B-Q, and Transactions)
- _____ Advance Student/Retiree Registration Fee \$95 (includes luncheons and Bar-B-Q; does not include Transactions)
- _____ Extra Copy of Transactions \$65
- _____ Extra Lunch Ticket (Spouse or Guest) May 22 Fee \$10
- _____ Extra Lunch Ticket (Spouse or Guest) May 23 Fee \$10
- _____ Extra Ozark Bar-B-Q Ticket (Spouse or Guest) Fee \$20
- _____ Reserve _____ seat(s) for me on University Transportation to Rolla—leaves airport at 4:30 p.m., May 21 Fee \$15
- _____ Spouse's Program Fee \$40
- _____ Spouse/Guest Name _____

Reservations:

- Reserve a room for me in the University Dormitory
 - Single
 - Double

Payment will be made upon registration at the dormitory

NOTE: Those wishing to utilize the local motels should make reservations directly

- I would like to attend the Chrysler Assembly Plant Tour on May 24th
- Vegetarian Meals requested

Payment:

Amount of Total Payment _____

Payment will be made by: _____

- Enclosed check (U.S. currency) payable to the University of Missouri-Rolla
- Purchase Order Number: _____
- Credit Card: VISA MasterCard

Cardholder's Name: _____

Cardholder's Signature: _____

Card Number: _____ Expiration Date: _____

Mail Registration to: Walter Ries, Coordinator of Continuing Education, 119 ME Annex, University of Missouri-Rolla, Rolla, MO 65401, or FAX to (314) 341-4992.



NAMRI SME

North American Manufacturing Research Institution of the Society of Manufacturing Engineers