

INTERNATIONAL INSTITUTION FOR PRODUCTION ENGINEERING RESEARCH NEWSLETTER

edited by the Technical Secretary
M. SANTOCHI

Nr. 12 - April 1998

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From the Editor

Dear Colleagues

I wish to inform you the next issue of the CIRP Newsletter is scheduled for

October 1998

All your contributions are welcome and will be considered for publication. For a fast and easy transmission of documents, you are invited to use the E-mail at the following address:

santochi@itm.unipi.it.

Please consider that the deadline for your contribution is

September 15th 1998

In addition I wish to remind you that CIRP has now a web site on Internet at

<http://www.lurpa.ens-cachan.fr/cirp.html>.

Visit the site and test its potentiality !!

A bibliographical research on CIRP annals by authors, by title and by keyword is possible, reading the text of the CIRP newsletter is also possible and more practical than receiving the yellow pages, links to WEB pages of CIRP members' labs are available and **links to your page are welcome !**

Technical Secretary

Marco Santochi

The

Prof.

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AWARDS

We have the pleasure to announce that in December, our Colleague Dr. **M. Eugene Merchant** traveled to Japan to be awarded the first-ever Japan Society for Precision Engineering (JSPE) Prize for a lifetime of internationally recognized innovations in the engineering of manufacturing. It's no surprise to industry insiders that this American engineer and scientist would be the first choice of

the JSPE to receive this award. For example, in 1975, he was elected to membership in the National Academy of Engineering, one of the highest honors for American Engineers. In 1995, he was one of just 18 people to be introduced into the Automation Hall of Fame at the Museum of Science and Industry in Chicago, an elite group that also includes management guru W. Edwards Deming. Since 1986, the American Society of Mechanical Engineers, in cooperation with the Society of Manufacturing Engineers, has awarded the M. Eugene Merchant Medal annually to exceptional individuals who have significant impact on improving the productivity of manufacturing operations. Dr. Merchant was the first recipient. He has received dozens of national and international awards for his contributions to manufacturing science and engineering.

Dr. Merchant is probably best known for his achievements during a 47-year career at Cincinnati Milacron, which included groundbreaking work in computer-integrated manufacturing beginning in the late 1950s. "As the computer began to get into industry, I realized that it would give manufacturing companies the capability, for the first time, to function as integrated systems", says Dr. Merchant.

By that time, he was already internationally known for devising the basic scientific theory, in the 1940s, to quantify the mechanism of the metal cutting process. "That work is still cited as the best scientific explanation of the process, in large part because it included a mental image, or picture, of what happens when metal is cut", says one of Dr. Merchant's proteges, Dr. Richard R. Kegg. Dr. Kegg is now Milacron's vice president of technology and manufacturing development, and president of the IAMS Board of Directors. He joined Cincinnati Milacron in 1954 as an engineering co-op student. "When I was still a young engineer with no experience outside Cincinnati, great researchers all over the world, who had written the classic books and papers in manufacturing, would be willing to meet with me for technical discussions", says Dr. Kegg. "It was really because of Gene and the prestige he enjoyed. If you worked for him, you were accepted".

At 84, Dr. Merchant continues to blaze trails in the application of technology, as part of his role as senior consultant at the Institute of Advanced Manufacturing Sciences (IAMS) in Cincinnati. "Gene Merchant is a mentor's mentor who has boundless generosity, both when it comes to sharing his knowledge, and to sharing the spotlight", says Harry Stone, IAMS Vice President. "He continues to accept frequent invitations to share his vision of the future of manufacturing in conferences around the World".

Since 1980, Dr. Merchant's work has often focused on the human resources side of technology application. There are two key conditions that must be met to make the most of technology and human resources, he notes. "First, the application of technology must be so engineered as to support the individuals who will use it, and not in a way which will require the user to support it. Secondly, every individual in the company must be enabled, empowered, and motivated to communicate and cooperate fully with every other individual in the company. Failure to satisfy these two conditions hobbles the performance of both the technology and the company's human resources".

The Institute of Advanced Manufacturing Sciences (IAMS) is a membership organization of manufacturers that provides manufacturing solutions for companies in Southwest Ohio, nationally, and internationally. More information on IAMS is available from web site at <http://www.iams.org>.

It is our pleasure to announce that the EUROPEAN CENTRE FOR PEACE AND DEVELOPMENT (ECPD) of the United Nations University for Peace, has appointed our Colleague, Professor Dr. **Vladimir Milacic** Special Adviser of the European Center of Peace and Development (ECPD) of the United Nations University for Peace for a period of two years, starting the 1st January 1998.

It is our pleasure to announce that our Colleague **Gunnar Sohlenius** has been elected as FELLOW in the World Academy of Productivity Science. This nomination has been granted to Gunnar Sohlenius by virtue of significant and longstanding contributions to the improvement of quality, quality of work, quality of work life, quality of life and productivity.

It is our pleasure to announce that **Mohamed A. Elbestawi**, P.E., Ph.D., a resident of Oakville, Ontario, Canada, and professor and chair, mechanical engineering department at McMaster University have been named a Fellow of ASME International (The American Society of Mechanical Engineers).

The Fellow grade is conferred upon a member with at least 10 years active engineering practice who has made significant contributions to the field. Professor Elbestawi earned his doctoral degree from McMaster University, Hamilton, Ontario, Canada. He is also a member of Canadian Society for Mechanical Engineering and Society of Manufacturing Engineers. Professor De Vries earned his doctoral degree from the University of Wisconsin, Madison. He is also a member of American Society for Engineering Education, International Institutions for Production Engineering and Society of Manufacturing Engineers.

It is our pleasure to announce that our Colleague **Warren R. De Vries**, Ph.D., a resident of Nevada, Iowa, and professor and chair, department of mechanical engineering, Iowa State University have been named a Fellow of ASME International (The American Society of Mechanical Engineers).

The Fellow grade is conferred upon a member with at least 10 years active engineering practice who has made significant contributions to the field.

Professor De Vries earned his doctoral degree from the University of Wisconsin, Madison. He is also a member of American Society for Engineering Education and Society of Manufacturing Engineers.

It is our pleasure to announce that **J. "George" Tlusty**, P.E., Ph.D., graduate research professor, mechanical engineering department, University of Florida, Gainesville, and president of Manufacturing Laboratories Inc. received the William T. Ennor Manufacturing Technology Award *for his accomplishments on machine tools and spindle design focusing on dynamic characteristics, numerical control, and rational specifications and tests*. The award was established in 1990 by the ASME Manufacturing Engineering Division and the Alcoa Company to recognize an individual or team for developing or contributing significantly to an innovative manufacturing technology, the implementation of which has resulted in substantial economic or societal benefits. Professor Tlusty, a native of Prague, Czechoslovakia, began his professional career designing machine tools at Ceska Zbrojovka in Strakonice, Czechoslovakia. For 21 years, from 1947 to 1968, he worked in Prague at the Research Institute for Machine Tools and Metal Cutting Technology, testing prototypes, developing machine tools and researching structures, drives and controls. He left Czechoslovakia in 1968 to become a research fellow at the University of Manchester in England. There he developed and tested machine tools, thus beginning his academic career. Professor Tlusty left England in 1971, accepting an appointment with McMaster University (Hamilton, Ontario, Canada). As professor of mechanical engineering, he developed a program in manufacturing engineering and a laboratory for machine tools and robots. His contributions to the field of machine tools earned him a prestigious visiting professorship at the University of California at Berkeley in 1977, and the next year, he was a visiting professor at the Technical University (Aachen Germany). Professor Tlusty has been on the faculty of the University of Florida since 1984. As a graduate research professor he established a computer-aided design and a computer-aided manufacturing laboratory, specializing in high-speed and high-power machining. He also initiated the now-established Machine Tool Research Center. In 1985, Professor Tlusty founded Manufacturing Laboratories Inc., a consulting firm that focuses on machining tools and machining processes that affect such areas as vibrations and control. Professor Tlusty is a Fellow of ASME International and the Society of Manufacturing Engineers (SME). He also is a member and past president of the International Institute for Product Engineering and Research. His awards include the 1954 Czechoslovak State Prize, the 1979 SME Gold Medal, the 1980 ASME Centennial Medallion and the 1990 ASME Blackall Award. Fluent in Czech, German, Russian, French and English, Professor Tlusty earned two mechanical engineering doctorates, one in philosophy and the other in science, both from the Technical University of Prague, where he also received the degree of Dipl. Ing.

We have the pleasure to inform that as of January the 15th 1998, our Colleague Professor **George M. Chryssolouris** became the Chief Executive Officer of the National Telecommunications Organization of Greece (OTE). OTE is the largest corporation not only in Greece but also in the South-East region of Europe. It has a turnover of 4 billion dollars a year, has approximately 23.000 employees and 20% of the Organization is publicly traded.

George M. Chryssolouris will remain though, Professor at the University of Patras.

It is our pleasure to announce that Dr. **Stephen Malkin**, a member of the mechanical and industrial engineering faculty at the University of Massachusetts, has been appointed as Distinguished Professor by University President William Bulger. The appointment was made following approval by the University's Board of Trustees at its meeting on February 4th 1998, in Boston. The honor recognize Dr. Malkin for outstanding academic distinction.

Dr. Malkin is only the fifteenth faculty member on the Amherst Campus to be awarded the title of Distinguished Professor. He was recommended for the honor by Chancellor David K. Scott, Provost Cora B. Marrett and Dean of the College of Engineering Joseph I. Goldstein.

"Dr. Malkin deserves this honor for his exemplary activities in research, teaching, and academic outreach" said Goldstein. "He brings his research expertise in the classroom, enlivening his teaching as a result. In fact this academic year he taught a section of our freshman engineering course."

A researcher in manufacturing and materials processing, Dr. Malkin is internationally recognized for his work on grinding and abrasive processes. An author of more than 150 technical papers and a book, "Grinding Technology: Theory and Applications of Machining with Abrasives", he has been elected a fellow of the American Society of Mechanical Engineers (ASME) and the Society of Manufacturing Engineers (SME), and is an elected member of the International Institute for Production Engineering Research. He has received the Gold Medal of the SME, the Blackall Award of the SME and the Outstanding Senior Engineering Faculty Award at Umass. Dr. Malkin joined the University in 1986 as a visiting professor and was appointed a tenured full professor the following semester. As a teacher of graduate and undergraduate engineering courses, students have consistently rated him an outstanding educator. In 1987, he was named director of the College of Engineering's Manufacturing Engineering Program. He is also a co-founder of the University's Center for Manufacturing Productivity, a program which pairs faculty from the College of Engineering and the School of Management with small- to medium sized manufacturing firms to improve productivity and competitiveness.

A native of Massachusetts, Dr. Malkin received his bachelor's master's and doctoral degrees from the Massachusetts Institute of Technology. Before joining the Umass faculty, he taught at the University of Texas, the State University of New York at Buffalo, and Technion-Israel Institute of Technology.

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Meetings, seminars and conferences

**31st CIRP International Seminar on Manufacturing Systems, Networked Manufacturing
Integrated Design, Prototyping and Rapid Fabrication**
May 26-28, 1998 - University of California, Berkeley

Topics

- Agent-based Manufacturing
- Virtual Manufacturing including Process Planning and Simulation
- Environmentally Conscious Design and Manufacturing
- Manufacturing Software Development
- Next Generation Machine Tools and Hybrid Machining
- Novel Rapid Prototyping and New Fabrication Techniques for Mechanical Components
- Agile Fixturing
- Open Architecture Machine and Process Controllers
- Sensor Systems
- Quality and Reliability Issues in Networked Manufacturing
- Management of Technology
- Technology Diffusion
- Time to Market Analysis
- Rapid Response Manufacturing
- Expert Systems in Manufacturing
- Design for Assembly and Manufacturing
- Heterogeneous Hybrid Design Environments including Web-based Design and Manufacturing

Fees for conference are \$300 advance registration and include lunches, Bay Cruise banquet and copy of the conference proceedings.

Information

Accessible by internet:

<http://esrc.me.berkeley.edu/cirp/register>

by phone: (510) 643 - 1825;

by fax: (510) 643 - 8982;

by writing to: Cirp Registration, ESRC

3115 Etchverry Hall #1750

Berkley CA 94720 - 1750.

Payment by check, Mastercard and Visa are accepted.

**6th CIRP International Seminar on Computer Aided Tolerancing Global consistency
of Tolerances**

March 22-24, 1999, Enschede, the Netherlands

Topics

- Tolerance specification
- Tolerance analysis
- Tolerance synthesis
- Tolerance representation
- Geometric Product Specification
- Functional Product Analysis
- Statistical tolerancing
- Education of tolerancing
- Computational metrology
- Tolerancing standards
- Industrial applications and CAT systems

Conference Secretariat

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New Tools and Workflows for Product Development

14/15 May, 1998 - Production Technology Centre- Berlin, Germany

Tools

- Tools for Product Planning
- Digital Mock-Up
- Virtual Clay Modelling
- Virtual Reality
- Interaction between Styling and Engineering
- Distributed/Cooperative Product Development /LI>
- CASE for CAD
- EDM/PDM
- PMS
- and others

Workflows

- Multi-Dimensional Process Controlling
- Reengineering of Product Development Process
- Simulation of Product Development Processes
- Market-Driven Product Development
- Globalised 24-Hour Product Development
- Virtual Company
- Concurrent/Simultaneous Engineering
- Outsourcing
- Life Cycling Orientation
- Interaction between Virtual and Physical Modelling
- Negotiation
- and others

Final programmes:

- Available on Web-site or can be ordered by
For information

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University of Belgrade
27. marta 80
11000 Beograd
Yugoslavia
Tel.: ** 381 11 337 03 41
Fax: ** 381 11 337 03 64
E-mail: maistorov.@cent.mas.bg.ac.yu

2nd German and French Conference on High Speed Machining

March 10-11, 1999 - Darmstadt University of Technology, Darmstadt, Germany

This Conference is organized by the *Institute of Production Engineering and Machine Tools* with the collaboration of the *University of Metz*, France, and the *Association Usinage Tr s Grande Vitesse (AUTGV)*, France, and the sponsorship of *CIRP*.

Main Topics:

- Fundamental Aspects and Modelling
(experimental, numerical and analytical approaches)
- Machine Tools and Components
(machine concepts, drive systems, spindles)
- Tooling
- High Speed Maching Process
- CAD/CAM Systems
- Industrial Applications

Language

The conference language is English (i.e. abstracts, papers, oral presentations). All presentations of the conference will be published in a proceeding volume.

Conference Secretariat

2nd German and French Conference on High Speed Machining
Institut für Produktionstechnik und Spanende Werkzeugmaschinen (PTW)
Technische Universität Darmstadt
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D-64287 Darmstadt
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Fax: +49 / 6151 / 16335

International Congress on
Molded Interconnect Devices

23.-24. September 1998 - Erlangen, Germany

Topics

7. MID Applications

- New Product Concepts and Designs
- Economical Aspects
- Technical Features
- Benefits from Freedom of Design

8. MID to the Market

- Learning by Doing
- Criteria for Process Selection

9. Manufacturing of MID

- Polymer Processing
- Metallization of Plastics
- Structuring of Circuitry

10. Advanced Materials

- Thermoplastics
- Auxiliary Materials

11. 3D-Assembly

- SMD, THT, Chip on MID
- Soldering
- New Interconnection Technologies

12. Integrated CAD/CAM Systems

- Coupling ECAD and MCAD
- 3D-MID-Layout, Design and Simulation

13. Quality Assurance

14. Recycling

- Disassembly
- Separation of Plastics and Metals
- Properties of Recycled Materials

15. Future Trends

Further Information and Correspondance

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Fourth International Symposium on Measurement Technology and Intelligent Instruments

Sep. 2-4, 1998, Miskolc, Hungary

Topics

16. Equipments, methods and systems of physical quantities measurement

- In process Measurement, Non-Contact Measurement
- Transducers, Smart Sensors
- Metrology of Physical Quantities
- Multi-Dimensional Measuring Technique

17. Intelligent Instruments and Measurements

- Intelligent Instruments
- Optical Measurement, Automatic Measurement
- Machine Vision, Measurement for Robotics
- Signal Processing, Artificial Intelligence for Measurement

18. Others

- Measurement Technology for Environment, Health and Safety
- Quality Control, Standards
- Telemetric Data Transmission
- etc.

For further information

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Books and journals

Books and Journals

Advanced Tolerancing Techniques

Hong-Chao Zhang, Texas Technical University, Lubbock, Texas
John Wiley & Sons Inc.

Since the 1960s, when engineering science replaced practice-oriented teaching in most American engineering colleges, the teaching of dimensional tolerancing has disappeared as a part of the training of industrial design and manufacturing engineers. Manufacturers adjusted to this lack of training either by instituting in-house training programs or by subcontracting dimensional tolerancing work to specialty firms. When computer-aided design (CAD) prompted a return to the practice oriented teaching approach in the mid- 1980s, tolerancing was not restored as part of most curricula. Part of the reason for this has been the lack of a suitable advanced research/reference volume that treats recent improvements in tolerancing techniques in a manner compatible with CAD, computer-aided manufacturing (CAM), and coordinated measuring machine (CMM) based inspection.

Advanced Tolerancing Techniques is the first book to provide comprehensive coverage of new developments in geometric dimensional tolerancing and statistical tolerancing, and to focus on the use of these techniques in a CAD/CAM/CMM environment. Editor Hong- Chao Zhang has assembled a team of international recognized experts in every aspect of tolerancing theory, techniques, and applications. These authors explore and explain tolerancing from its history and fundamentals to state-of-the-art techniques. They also describe specialized applications of tolerancing in particular industries, including automobiles, electronics, and aerospace.

The subject "Dimensioning and tolerancing for function" was written by our Colleague professor R. Weill.

For product design, manufacturing, and R&D engineers, as well as production managers, this one-stop resource unifies the disparate aspects of the discipline and is the only source for completely up-to-date and authoritative information on the latest tolerancing techniques. It is also an important reference for graduate students and CAD/CAM/CAPP software developers.

Synergetics of Measurement, Prediction and Control

I. Grabec, University of Lubjiana, Slovenia
W. Sachse, Cornell University, Ithaca, NY, USA

1997. XX, 458 pp., 153 figs., 5 tabs. (Springer Series in Synergetics, Vol. 68) Hardcover
DM 128, - ISBN 3-540-57048-9

In this monograph, a statistical description of natural phenomena is used to develop an information processing system capable of modeling non-linear relationships between sensory data. The system, based on self-organized, optimal preservation of empirical information, applies these relationships for prediction and adaptive control. This monograph is written for students, scientists and engineers in academia and industry who are interested in experimental work related to the adaptive modeling of natural laws, the development of sensory-neural networks, intelligent control, synergetics and informatics. No specific knowledge of advanced mathematics is presupposed. Examples taken from physics, engineering, medicine and economics demonstrate the applicability of such intelligent systems.

Contents:

1. Introduction
 2. A Quantitative Description of Nature
 3. Transducers
 4. Probability Densities
 5. Information
 6. Maximum-Entropy Principles
 7. Adaptive Modeling of Natural Laws
 8. Self-Organization and Formal Neurons
 9. Empirical Modeling by Non-Parametric Regression
 10. Linear Modeling and Invariances
 11. Modeling and Forecasting of Chaotic Processes
 12. Modeling by Neural Networks
 13. Fundamentals of Intelligent Control
 14. Self-Control in Evolution of Biological Organisms
- A. Fundamentals of Probability and Statistics
 - B. Fundamentals of Deterministic Chaos
 - Subject Index.

The Science of Innovation: A Managerial Overview of the TRIZ Methodology Victor Fey
Eugene Rivin

This book provides the reader with a basic understanding of TRIZ -a powerful methodology for enhancing engineering creativity. Where conventional trial and error approach fails, TRIZ proves to be the most reliable engineering methodology for product and process development. TRIZ does not help to find just a solution -it aims for the best result by eliminating psychological inertia and

maximizing utilization of the system's resources.

TRIZ was developed by Genrikh Altshuller after analysis of hundreds of thousands of patented inventions. He discovered that all technological systems evolve according to certain patterns formalized as the Laws of Technological System Evolution. Knowledge of these Laws help engineers develop next generation products and processes. Use the Laws of Evolution creates opportunities for strategic patent fencing and circumventing competitor's patents.

The Algorithm for Inventive Problem Solving and other powerful problem-solving techniques of TRIZ, help to clearly define the problem and to find cost effective ways to solve it. TRIZ is credited with helping engineers in many countries to develop numerous breakthrough solution. Frequently, pioneering concepts were discovered in a matter of hours. This book is a first in a series of books describing in detail various aspects of TRIZ. Its content is based on the unique experience of the authors in the TRIZ training in the U.S. and overseas (numerous hands-on training and problem solving sessions, both public and at large corporations; many offerings of the first and only in the U.S. university course on TRIZ at Wayne State University in Detroit, etc.).

Call for Papers

Special issue of **Int. J. Robotics and Computer Integrated Manufacturing**
on
ReManufacturing

Possible topics for submitted papers include, but are not limited to:

- Disassembly process (methods and tools)
- Robotics applications
- System design (methodologies and showcases)
- Design for Disassembly
- Logistics chains for recycling and disassembly
- Comprehensive surveys of the state of remanufacturing/disassembly systems

Further information:

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From the labs

Department of Manufacturing Engineering and Engineering Management
City University of Hong Kong

Assistance is sought from CIRP colleagues in locating suitable people to fill academic positions

Positions available:

- Professor (HK\$ 70-93k p.a.)
- Associate Professor (60-90k)
- Assistant Professor (43-73k p.a.)

+15% gratuity, possible housing allowance and only 15% tax! (Presently 1US\$ = 7.75 HK\$)

Areas of Expertise Sought:

- Industrial Engineering
- Engineering Management
- Operations Research:
 - Production
 - Materials
 - Product
 - Project
 - Quality
 - Logistics
 - Operations
 - Reliability
 - Maintenance Management.

The Department has excellent research facilities (over 60 research students and assistants) and offers programs ranging from Bachelor to PhD level.

Further details are available with CIRP colleague Patri K. Venuvinod. He is available at this meeting and will appreciate any interest shown or assistance provided.

E-mail: mepatri@cityu.edu.hk

School of Mechanical Engineering University of Leeds, UK
Design and Manufacture Group

Search for Staff as

**SENIOR LECTURER
LECTURER
RESEARCH FELLOW**

Informal enquires about/expressions of interest in the above positions should be made to Professor Alan de Pennington (adep@mech-eng.leeds.ac.uk) or Professor Tom Childs (thcc@mech-eng.leeds.ac.uk). It is expected that this search will lead to setting up formal application procedures.

Experiences required for these post are:

- proven research leadership and strong publication record (Senior Lecturer)
- strong publication record (Lecturer)
- evidence of potential to develop to Lecturer/Senior Lecturer (Research Fellow)

The School of Mechanical Engineering is top research rated in the UK.

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