

# **INTERNATIONAL INSTITUTION FOR PRODUCTION ENGINEERING RESEARCH NEWSLETTER**

edited by the Technical Secretary  
**M. SANTOCHI**

Nr. 13 - October 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

**April 1999**

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@ing.unipi.it.**

Please consider that the deadline for your contributions is:

**March 15th 1999.**

In addition I wish to remind you that **links to your own homepages are welcome** on CIRP's web site.

The Technical Secretary  
Prof. Marco Santochi

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## *Awards*

It is our pleasure to announce that our colleague, Professor **Inyong Ham**, Distinguished Professor Emeritus, Pennsylvania State University, has received the highest civilian award of Republic of Korea; *Mukungwha Award* at the national ceremony of *Science Day* on April 21, 1998, in recognition of Dr. Ham's distinguished service for advancement of science and technology in Korea and also his outstanding professional accomplishments world-wide in engineering education and research.

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It is our pleasure to announce that our colleague Professor **Hubert J. J. Kals** has received by the Society of Manufacturing Engineers (SME) the 1998 SME Frederick W. Taylor Research Medal at SME's Annual Awards Banquet on Saturday evening, May 30 1998, at the Renaissance Cleveland Hotel, Cleveland, Ohio. He has been honored for his academic and research leadership and the outstanding quality and quantity of his published writings, all of which have contributed to improved manufacturing processes. His research has emphasized manufacturing technology and operations management. Similarly, his leadership role among technical and research committees of the European Community and including the International Institution for Product Engineering Research (CIRP), have enhanced manufacturing progress worldwide. The SME Frederick W. Taylor Research Medal is granted for published research leading to a better understanding of materials, facilities, principles, and their operations, and their application to improve manufacturing processes. Dr. Kals is a professor and head of the Laboratory of Production and Design Engineering, Department of Mechanical Engineering, University of Twente, The Netherlands. In 1995, he founded the university's Centre for Integrated Manufacturing and Development, where he currently serves as director. In addition, he serves as advisor to several industrial companies and as president of CIRP. Dr. Kals' creation of software is the direct result of his pioneering research in planning and control of manufacturing operations in factories. Industrial demand for this product resulted in the formation of two companies that serve to market and apply the software to industry. Since 1993, he has been active in the development and introduction of a new project-based undergraduate manufacturing education program. The manufacturing aspect (in which 40 percent of the education activities are executed by student teams) has been the first project-based program of its kind implemented at a technical university in The Netherlands. Dr. Kals has authored six books and more than 150 research and technical papers on metal cutting, sheet metal working, stability of machine tools, tool materials, computer aided process planning, and the control and monitoring of networks for workshop control. Among his many achievements, he was granted a Fellowship from the Royal Society of London; a Certificate of Recognition of Outstanding Contributions to Engineering Education and Research from George Washington University; and an honorary membership from the Rumanian Society of Mechanical Engineers. Dr. Kals earned bachelor's and

master's degrees cum laude and received his doctorate in technical science from the Technological University of Eindhoven in The Netherlands.

\*\*\*\*\*

It is our pleasure to announce that our colleague Professor **Marvin F. DeVries**, has received by the Society of Manufacturing Engineers (SME) the 1998 SME Education Award at SME's Annual Awards Banquet on Saturday evening, May 30 1998, at the Renaissance Cleveland Hotel, Cleveland, Ohio. Dr. DeVries has been a dedicated and active advocate of manufacturing engineering education at many levels. Internationally recognized for his contributions, he has devoted countless hours to advance teaching methods and has influenced many students to pursue careers in manufacturing engineering. The SME Education Award is granted for development of manufacturing related curricula; fostering sound training methods; or inspiring students to enter the profession of manufacturing engineering. Dr. DeVries is a professor of mechanical engineering at the University of Wisconsin-Madison, where he was instrumental in founding the Master of Science degree program in manufacturing systems engineering. This program, the first of its kind in the United States, has won numerous academic and industry awards as well as the 1988 SME University LEAD Award. LEAD is an acronym for "Leadership and Excellence in the Application and Development of Enterprise-Wide Integrated Manufacturing." He has spent more than 30 years in teaching and other education-related activities in the area of manufacturing processes and systems. Dr. DeVries has made his mark through his unique contributions. As senior program director with the National Science Foundation, he advanced manufacturing research and education in the U.S.; and since 1990, he has chaired the manufacturing systems engineering program at the National Technological University, Fort Collins, Colo. Active internationally, he is currently a vice president of the International Institution for Product Engineering Research (CIRP) and a Life Fellow of the United Kingdom's IProDE. Dr. DeVries joined the Society in 1960, and is now an SME Fellow. He currently serves on the International Conference on Education in Manufacturing and is a founder and steady supporter of the North American Manufacturing Research Institution of SME (NAMRI/SME). He is also a past SME president. Dr. DeVries earned his master's degree in mechanical engineering from the University of Michigan, Ann Arbor. His doctorate in mechanical engineering was received from the University of Wisconsin-Madison.

\*\*\*\*\*

It is our pleasure to announce that our colleague, Professor **H.K. Toenshoff** has been honoured by the Technical Faculty of the Aristoteles University of Thessaloniki, Greece, with the title of Honorary Professor.

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It is our pleasure to announce that our colleague, Professor **Jay S. Gunasekera**, Moss Professor and Chair, Mechanical Engineering Department at Ohio University, has been named a Fellow of SME (Society of Manufacturing Engineers). There are over 70,000 members of SME worldwide and over 200 Fellows. Professor Gunasekera earned his doctoral degree (Ph.D.) from Imperial College, London and the higher doctoral degree (D.Sc.) from the University of London. He is also a Fellow of the Institution of Mechanical Engineers, U.K.

\*\*\*\*\*

We are glad to announce that our Colleague Prof. **Hoda A. ElMaraghy**, has been elected by the Society of Manufacturing Engineers (SME) for induction into the 1998 College of Fellows. Chosen for her many years of outstanding contributions to manufacturing and SME, Dr. ElMaraghy will be installed as a Fellow November 8 during the Society's Fall Board of Directors Meeting in Houston, Texas. Dr. ElMaraghy has established many research benchmarks in the advancement of manufacturing science and the frontiers of knowledge in intelligent automation and design. She is leader in innovative university/industry partnerships and an educator with an unmistakable impact

in Canada and internationally. Dr. ElMaraghy, a professor and director of the Intelligent Manufacturing Systems (IMS) Centre, University of Windsor, Ontario, Canada, has made significant contributions to manufacturing engineering education and design/manufacturing integration research. She introduced Canada's first accredited doctoral program in manufacturing systems engineering at University of Windsor, Ontario, and was also one of founders of the accredited manufacturing engineering programs at McMaster University, Hamilton, Ontario, Canada. Dr. ElMaraghy established two industrial research chairs at University of Windsor and is a founding member of two major centers of Research Excellence in Canada which feature strong industry collaboration. Results of her research efforts have been published worldwide in more than 240 scientific and engineering journal and conference articles on flexible manufacturing, rapid modeling and reverse engineering, robotics, and intelligent automation. Dr. ElMaraghy hold membership in Computer and Automated Systems Association of SME (CASA/SME) and North American Manufacturing Research Institution of SME (NAMRI/SME) and has been extensively involved with SME-sponsored publications and conferences. She currently sits on the Program and Steering Committees of Society's Manufacturing Education Conference. Dr. ElMaraghy received her bachelor's from Cairo University, and her master's and doctorate degrees from McMaster University.

\*\*\*\*\*

We have the pleasure to announce that our Colleague **Dr. D. K. Bowen**, President of Bede Scientific Incorporated, in 1997 was elected Fellow of the UK Royal Academy of Engineering and this year elected a Fellow of the Royal Society.

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It is our pleasure to announce that our colleague Professor **K. P. Rajurkar**, Mohr professor of engineering and director of the Center for Nontraditional Manufacturing Research at the University of Nebraska, Lincoln, USA, has been named a Fellow of ASME International (The American Society of Mechanical Engineers) . In addition he has been elected as the 1998-99 President of the North American Manufacturing Resarch Institution of SME (NAMRI/SME). He succeeded William R.D. Wilson, Ph.D., FSME, of Northwestern University, during the group's annual conference, NAMRC XXVI, held May 19-21 at the Georgia Institute of Technology in Atlanta. The ASME Fellow grade is conferred upon a member with at least 10 years active engineering practice who has made significant contributions to the field. Professor Rajurkar earned a BS degree with honors at Jabalpur University in India and his doctorate at Michigan Technological University, Houghton , USA . He also chairs the manufacturing systems engineering programs and serves as a reviewer for several professional journals, including the SME Journal of Manufacturing Systems, has more than 100 published papers, and holds a patent on cryogenically cooled tool machining.

\*\*\*\*\*

We are glad to announce that our colleague Professor **A. G. Mamalis**, has been unanimously elected as a Member of the Hungarian Academy of Sciences.

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It is our pleasure to announce that our colleague Professor **Y. Altintas** received the first "Technology Partnership Award " for his contributions in advancing manufacturing technologies in gas turbine applications at Pratt & Whitney Canada. Pratt & Whitney Canada is the second largest R&D spender in Canada after Northern Telecom company, and it is a aircraft jet engine manufacturing company. Pratt & Canada reported an average of 50% improvement in 5 axis peripheral milling of jet engine compressors by implementing the adaptive control and chatter vibration free milling process design techniques developed by Prof. Altintas.

\*\*\*\*\*

It is our pleasure to announce that Dr. **Jan Christian Aurich** has been honoured with the Taylor-medal for his paper "A unified approach to freeform and regular feature modelling" which was presented in the "D" session at the General Assembly 1996 in Como. Dr. Aurich has worked at the IFW in Hannover with Prof. Toenshoff from 1990-1995. He is now in charge of quality and process management in the axis division of Daimler Benz in Stuttgart.

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## ***Meetings, Seminars and Conferences***

### **The 32nd CIRP International Seminar on Manufacturing Systems New Supporting Tools for Products and Production Systems**

*May 24-26, 1999 - Leuven, Belgium*

#### **Topics:**

- Reverse engineering
- Virtual engineering
- CAE and simulation for design optimisation
- Expert design systems
- Design of manufacturing systems
- Rapid prototyping
- Design for manufacturing, assembly
- Simulation of production, production systems and tools
- Enterprise modelling
- Pre-series fabrication and testing
- Rapid tooling

#### **Information:**

Mrs. L. Notré  
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<http://www.mech.kuleuven.ac.be/pma/events/cirp32/>

### **6th ICTP - International Conference on Technology of Plasticity**

*September 19-23, 1999 - Nuremberg, Germany*

#### **Topics:**

- Computer Aided Engineering

- Ecology and Economy
- Forming of Microparts
- Layout and Design of Forming Tools
- Machines and Automation
- Materials Engineering
- Process Simulation
- Quality Management
- Rapid Tooling
- Tribology

in all fields of metal forming technology:

### **Processes**

- Bending, Shearing, Levelling
- Cold, Warm, Hot Forging
- Deep Drawing
- Extrusion and Drawing
- Hydroforming
- Rolling
- Stamping
- Others (Forming by Laser, Forming by Shot Peening, Joining by Forming, Roll Forming, Rotary Forming, Spinning, Tube Forming)

### **Information:**

All correspondance and questions related to the 6th ICTP should be addressed to Mr. Christian Hinsel at:

6th ICTP Conference Office  
 Chair of Manufacturing Technology (LFT)  
 Egerlandstr. 11  
 D-91058 Erlangen  
 GERMANY

Tel: +49 / 9131 / 85-317 or +49 / 9131 / 85-7140  
 Fax: +49 / 9131 / 364 03  
 E-mail : ictp@lft.uni-erlangen.de

**1st Conference and general meeting of the European Society for  
 Precision Engineering and Nanotechnology**

*May 31st - June 4th 1999  
Congress Centre Bremen (CCB), Bremen, Germany*

**Topics:**

- Optical Systems - From the Macro to the Nano Scale
- Precision Engineering in Aerospace and Space Technology
- Micro-Electro-Mechanical Systems (MEMS)
- Biotechnology and Biomedical Applications
- Precision Machines
- Nano Fabrication Processes and Assembly
- Mechanical and Chemo-Mechanical Processes
- Energy Assisted Processes
- Silicon Engineering
- Material Properties in the Nanometric Range
- Assessment of Surface and Sub-Surface Properties
- Dimensional Metrology
- Metrology in the Nanometric Range
- Modelling and Simulation in Micro- and Nanotechnology

**Information:**

Conference Secretariat  
1st euspen Conference - Headquarters  
Professor Dr-Ing E. Brinksmeier  
Universität Bremen FB4/FG06  
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Phone: ++49 (0)421 218 7481  
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<http://www.euspen.com>

**NAMRC XXVII**  
**Twenty-Seventh North American Manufacturing Research Conference**  
*May 25-28, 1999*  
*University of California at Berkeley - Berkeley, California*

**Topics:**

- Mechanics and technology of material removal processes, including non-traditional processes;
- Design, dynamics, control and accuracy of machine tools;

- Mechanics and technology of material forming processes, including powder consolidation, casting, welding, and polymer and composite materials processing;
- Material behavior and tribology, as related to manufacturing processes;
- Computer-aided design and manufacturing, including robotics, automation process planning, and rapid prototyping;
- Manufacturing systems, simulation and design, including concurrent engineering;
- Human factors and non-machine interactions relating to manufacturing processes and systems;
- Rapid response manufacturing, networked manufacturing and environmentally-conscious manufacturing.

### **Information:**

Kristen Dudash  
 Manager, NAMRI/SME  
 Society of Manufacturing Engineers  
 One SME Drive, P.O. Box 930  
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 Internet E-mail: dudakri@sme.org

**X Workshop on Supervising and Diagnostics of Machining Systems**  
**Innovative and integrated Manufacturing**  
*Karpacz, Poland 21st - 26th March 1999*

### **Topics:**

1. **Innovative product design methodology modelling**
  - simulation;
  - design for rapid prototyping;
  - design theories supporting group design;
  - concurrent simultaneous design;
  - multimedia design and product negotiation;
  - virtual design;
  - product cost efficient evaluation;
  - product design process diagnostics and supervising.
2. **Innovative manufacturing systems**
  - new efficient planning systems;
  - virtual factory;

- advanced manufacturing techniques;
- efficient product and process design;ù
- efficient cellular manufacturing;
- Internet and manufacturing.

### 3. **New integrated manufacturing solutions**

- state of the art CIM and future trends;
- integration of business and production level;
- promotion of innovative production in SMEs;
- intelligent systems and control;
- production management systems;
- new flexible production solutions;
- efficient diagnostics supervision and control of production process;
- automation for integrated manufacturing;
- communication systems for integrated manufacturing;
- integrated measurements systems for integrated manufacturing;

### 4. **High speed high accuracy manufacturing - innovative techniques and technologies**

- machines and devices;
- maintenance supervising;
- human factors;
- environmentally safe high speed manufacturing.

#### **Information:**

X Workshop  
 Wroclaw University of Technology  
 Institute Production Engineering & Automation (I-24)  
 ul. Wybrzeze Wyspianskiego 27  
 50 - 370 Wroclaw, POLAND

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**31st International Symposium on Robotics  
 and  
 Robotics of Tomorrow Exhibition**  
*May 14-17, 2000 - Palais des Congrès - Montreal, Canada*

#### **Topics:**

- The future of Robotics
- Robotic Applications in Industries, Medicine and Space
- Robots in Manufacturing Applications
- Robot Vision Systems and other Sensors
- Mobile Robots
- Service Robots
- Robot Control
- Intelligent Robots
- Emerging Technologies in Robotics
- Strategic and Financial Management Issues
- Safety and Reliability - International Standardization
- Education and Training
- Virtual Reality Techniques
- Ethics and Artificial Intelligence
- Commercialization and Technology Transfer Issues

**Information:**

*ISR 2000 Secretariat*

Tel. 1-613-241-9333

Fax: 1-613-565-2173

E-mail: [gpi@intranet.ca](mailto:gpi@intranet.ca)

<http://www.precarn.ca/isr2000>

ECPD - European Center for Peace and Development  
 Round Table Conference on  
**University in/for Transition**  
*10-11 December 1998, Belgrade, Yugoslavia*

**Topics:**

- University policy, restructuring and development
- Faculty establishment in global competitive world and transition process
- Professor-student paradigm in transition University through transition
- University/industry coevolution process in future
- Digital technology and training/management techniques
- Virtual University networking into global University scheme

- Intellectual capital/knowledge management and international competition/cooperation/convolution concepts
- Science/technology research and transfer through University environment towards society
- New generation of global knowledge based leaders and managers

**Information:**

*General Secretariat:*

Milovan Markovic, Nenad Milicevic

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A Joint-Symposium on  
**Recent Advances in Machine Tools: Metrology and Modeling**  
 Sponsored by the ASME - Manufacturing Engineering Divisions  
 1999 ASME International Mechanical Engineering Congress and Exposition  
 November 14-19, 1999  
**Nashville, Tennessee, USA**

**Topics:**

- Metrology, Benchmarking and Performance Characterization
- Kinematics/Dynamics Modeling and Virtual Machines
- Intelligent Sensing and Control of Machine Tools
- Design and Development of Parallel Architecture Machines
- Implementation of Open Architecture Controller for Machine Performance Enhancement

Symposium Organizers

Dr. Jong-I Mou  
 Department of Industrial  
 Engineering  
 Arizona State University  
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 P.O. Box 969, Mail Stop 9430  
 Livermore, CA 94551-0969  
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 Fax: (510) 294-3870  
 E-mail: [cking@sandia.gov](mailto:cking@sandia.gov)

**Machining Science and Technology**  
 Sponsored by ASME - Manufacturing Engineering Division  
 1999 ASME International Mechanical Engineering Congress and Exposition  
 November 14-19 1999, Nashville, Tennessee

**Topics:**

- Physics of machining
- Modeling of machinability of materials
- Mechanics of chip formation as applied to the modeling of chip forming elements and chip breakability
- Role of cutting fluids and transition toward dry cutting
- Cutting forces and cutting dynamics.

#### Symposium Co-Organizers

Professor Viktor P. Astakhov  
 Department of Mechanical  
 Engineering  
 Concordia University  
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 H3G 1M8  
 Tel.: (514) 848-8671  
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Dr. Sam Li  
 Industrial Research and Development  
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 Tel.: (705) 527-4554 ex. 255  
 Fax: (705) 526-2701  
 E-mail: s.li@irdi.on.ca  
 Internet Home Page:  
<http://members.tripod.com/~symposium 2/>

#### **10th International Colloquium on surfaces**

*31. January - 2. February 2000 - Chemnitz University of Technology, Chemnitz, Germany*

#### **Topics:**

- Specification, extraction and association of micro and macro surface topography for functional requirements and production control.
- Surface roughness specification for functional needs and surface roughness measurement for production control
- Tribological properties of micro and macro topography
- Surface texture on micromechanical parts
- Surface texture for medical applications
- Surface texture under the aspect of environmental protection
- Surface topography generation
- Surface texture measurement technology
- Coordinate measurement technology for form, location and orientation

#### **Information:**

Prof. Dr. Michael Dietzsch  
 Chemnitz University of Technology

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**15th National Conference on Manufacturing Research**  
*6, 7 & 8 September 1999 - University of Bath, UK*

## **PRELIMINARY ANNOUNCEMENT**

### **Information:**

The Organising Secretary  
15th NCMR Conference  
Department of Mechanical Engineering  
University of Bath  
Bath BA2 7AY, UK  
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<http://www.bath.ac.uk/Department/Eng/manuf>

### **IX. International Conference on Production Technology**

## **PTK 98**

**Technology Management  
Regional Strengths and Global Opportunities  
Added Value by Innovation**

**October 29 and 30, 1998  
Berlin, Germany**

The globalization of the economy continues. Manufacturing enterprises need an approach to technology management capable of using regional strengths to realize global opportunities. Here lies the key factor in increasing productivity and curbing unemployment. A dynamic economic policy has to support such a development by providing a suitable business environment. Strategies for globally acting companies have to be reassessed. The rediscovery of one's own potentials is the key provision to secure the future. The pursuit of top notch technology could facilitate dynamic products and process innovation. This challenge is directed towards the renewal of technology management. Regional strengths define the future orientation of the global network of production as well as development locations. However, productivity determines the pattern of the business processes of the enterprise and thus the regional added value. Against this background competitive potentials have to be developed that can keep pace with national economies, which operate differently. The International Conference on Production Technology (PTK) has a long tradition. Every three years it is "the event" in Berlin for those interested in the progress of production technology. As an international forum the PTK 98 will promote the exchange between experts from industry and research. The focus will be on finding strategies to increase the added value through technology management in global competition. Welcome to Berlin.

### **Further Information and Registration:**

Mrs. Heike Krieger  
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Internet: <http://www-plt.ipk.fhg.de/PTK98>

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## ***BOOKS AND JOURNALS***

### **Journal of Engineering Manufacturing**

The Journal of Engineering Manufacturing provides a focus for new developments in engineering manufacture by publishing papers covering technological and scientific aspects of original research, development and management strategies in manufacturing.

The scope of the Journal includes:

- Developments in automation
- Engineering materials
- Energy beam technology
- Computer based modelling
- Control and simulation systems
- Assembly
- Production planning
- Quality
- Logistics

The Journal is Abstracted and Indexed in many of the major world databases including: Current Contents; Engineered Materials Abstracts; Fluid Abstracts; Process Engineering; Global Mobility Database; INSPEC; Metals Abstracts; Research Alert; SciSearch, Fluidesx.

### **Submission of Papers**

Submissions to the Journal are welcome. All articles are subject to rigorous, fair and efficient peer review to ensure high quality standards and international relevance. No page charge is requested and no rigid length restrictions exist . However, every article should be as concise as is practicable, and the content should always justify the length. Potential authors are advised to consult the instructions for authors included in every Journal issue for further information.

Papers can be submitted directly to the Editor.

Editor  
Professor A. N. Bramley

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## *From the Labs*

### **The Laser Zentrum Hannover expands**

In December, 1997, the Laser Zentrum Hannover (LZH) cut the blue ribbon to open their new 1000 m<sup>2</sup> large science wing. Apart from offices for engineers and physicists, the new addition includes 14 laboratories, and multi-media training and education facilities.

This expansion was necessary, even though the LZH moved into an entirely new building in only 1991. This site soon became too small for the continually growing team of scientists and workers (from 25 employees when the LZH was founded in 1986 by Prof Toenshoff, Prof. Haferkamp and Prof. Welling, to now nearly 200).

Furthermore, increasing national and international research and development activities in the field of laser technology have led to the LZH becoming one of the most important laser research institutes in Germany, if not in Europe.

The new LZH facilities have led to increased research activities, especially in the fields of laser medicine and diode laser applications.

Furthermore, new measures in the field of laser training and education have become possible.

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Fax: ++49-511-2788-100  
email: od@lzh.de  
<http://www.lzh.de>

### **New high speed milling machine at IFW**

The Institute for Production Engineering and Machine Tools (IFW) has provided a new high speed milling machine FST-CL 160 of the manufacturer Gebr. Heller, Noertingen, Germany. This machine is equipped with linear direct drives in all axes, allowing a maximum acceleration of 2 g for the z-axis. Due to an adopted design it is possible to run this machine either with a conventional ball bearing spindle (16.000 rpm/36kW) or two different spindles with active magnetic bearings (40.000 rpm/40kW or 70.000 rpm/10kW). The machine will be used in different research projects to investigate the fundamentals and limitations of high-speed cutting.

### **New European Projects**

Projects of LZH:

## LASCON

Starting in October 98, the LZH will be participating in a European funded, Brite-Euram project named LASCON. The aim of the project is to integrate condition and process monitoring technology into high power laser systems. The availability and process quality will therefore be considerably improved. The consortium of this project therefore encompasses a car manufacturer (FIAT from Italy), a production systems manufacturer (COMAU from Italy), a machine tool manufacturer (BALLIU from Belgium), a laserjobshop (HTL from Finland), a laser manufacturer (ROFIN-SINAR from Germany) and suppliers of laser related equipment (LASERPOINT from Italy and PERMANOVA from Sweden). The project will have a duration of 3 years and with a total cost of 2.1 MEcu.

## FEMTO

One of the latest European Projects launched in September 1998 in co-operation with the Laser Zentrum Hannover (LZH) is entitled "Precise Machining by Femtosecond Laser Pulses" (FEMTO). The goal of this Brite Euram project, which is running for three years, is the realization of a complete femtosecond laser micro-machining system, which is suited for structuring delicate and problematic materials like medical implants and sophisticated detectors for photo-emissive technology. The lasers used in the project emit pulses with duration of 150 fs and peak power up to 13 GW. The LZH as the project coordinator is in charge of developing the machining processes, while the project partners Thomson- CSF Laser and Elia (Equipe Laser Intenses et Applications, University Bordeaux) are responsible for the realization of an industrial suited femtosecond laser system, which is integrated into a machining system by Exitech Ltd. Applications are given by Biotronik and Photek Ltd.

### Projects of IFW:

## COCOS

This project deals with "CBN-grinding of crankshafts in one set-up (COCOS)". The main goal is to reduce the process chain of a crankshaft considerably by using a flexible out-of-roundness grinding operation, trying to also integrate the heat treatment by the use of grind-hardening.

The project is coordinated by Danobat, Spain, as machine tool manufacturer, besides the IFW the University of Bristol and the University of Bremen are involved as research institutes, Ford, UK, and Renault Truck Division, Spain, are included as end-users. Further support is given by ELF, France, as coolant supplier, Unicorn, UK, as grinding wheel manufacturer and Nordmann, Germany, as specialist for monitoring. The project has a duration of 3 years and is running in Brite Euram III.

Outside of this project the IFW has provided a new CBN grinding machine CR 41 CBN from Schaudt, Germany, to be able to investigate the process of out-of-roundness grinding of crankshafts or camshafts in one set-up.

## SAMMI

This new Brite-Euram project is related to "Safe and economic machining of magnesium castings (SAMMI)". Within three years it is the aim to develop a safe and clean manufacturing process and a suitable machine tool, equipped with all necessary features. Besides IFW the consortium comprises Fiat, Italy, as one of the biggest European manufacturers of cars, Renault automation, France, as a builder of machine tools, two manufacturers of cooling lubricants, Fuchs (Germany) and ELF (France), Plansee Tizit as tool supplier, CemeCon as manufacturer of tool coatings and System Metalli, Italy, as magnesium supplier.

## DATEG

The "Development of advanced tools for ecological and economic sawing of granite (DATEG)" is the topic of this new Brite-Euram project. It is the aim to develop extremely thin blades for the sawing process of granite to reduce the waste and the process costs dramatically. The project is coordinated by Pedrini, Italy, as machine tool manufacturer, with the partners Martin Miller, Austria, as manufacturer of steel centres for saw blades, Argon Diamant, Italy, as tool manufacturer, AE Intertrade, Greece, as end-user and the IFW as experienced research institute in the field of stone cutting. The project duration is granted for three years.

## FLAMINGO

This project has the aim to achieve a substantial "Flank milling optimization (Flamingo)" for complex geometries of turbo-machinery components. Point milling shall be substituted by flank milling to reduce the machining time as well as tool consumption and wear. Furthermore the material removal rates and surface quality will be improved. The consortium comprises two aeroengine manufacturers, SNECMA, France, and Rolls-Royce, UK, Norsk Jetmotor, Norway, as manufacturer of jet engine components, Dassault Systemes, France, as well known CAD/CAM-system supplier, dCADE, Germany, as developer of a NC simulation system, COMAU, Italy, as machine tool manufacturer and the IFW as research institute. Also this Brite-Euram project has a duration of three years.

## DEDEMAS

In the project "Decentralised Decision Making and Scheduling (DEDEMAS)" the following consortium is active: Ahlstrom Machinery Corporation (FI), Centro de CIM do Porto (PO), IFW University of Hannover (DE), Rautaruukki Oy Metform (FI), VTT Automation (FI), WM-data-oy (FI), Werner & Pfleiderer Lebensmitteltechnik (DE) The goal of the DEDEMAS project is to develop mechanisms for decentralised scheduling and decision making covering both manufacturer's multi-site operations and its chain of suppliers.

Development of mechanisms and a prototype support system for global production process optimisation based on decentralised operation

- Establishment of a framework for combination of local knowledge and decentralised control with communication, co-operation and global goals propagation in order to reach globally optimal production processes.
- Establishment of a framework for the communication between autonomous, co-operative manufacturing entities.
- Implementing a prototype support system using a scaleable degree of decentralisation, based on hardware and software technology available today.

## MOSCOT

The development of a "Modular Shop Toolkit for Flexible Manufacturing (MOSCOT)" is the aim of the following consortium: MCS International (IRL), Foundation Tekniker (ES), Centro de Cim do Porto (PO), IFW Institute for Production Engineering and Machine Tools - University of Hannover (DE), Ahlstrom Machinery Corporation - Savonlinna Works (FI), Frezite (PO) - Ferramentas de Corte, Estamcal (ES).

The objective of MOSCOT is to implement a new architecture for shop control in a modular shop control toolkit.

The architecture is based on a central kernel which acts as a service provider for shop control shells. The shells are applets (small applications working together as part of a larger whole) which

implement shop control functions such as scheduling, database interfacing, user interaction and SCADA interfacing. Shells may be activated, deactivated, replaced, attached to and released from the kernel without having to shut down the kernel itself. This allows a great degree of flexibility and customisability.

The toolkit will consist of a central kernel and a comprehensive array of shell modules; modules may be selected from this array and combined via the kernel to produce a shop control system which is tailored to each manufacturer's specific needs.

## ROBOTOOL

This project focusses on the development of new technologies for prototypes of agile machining systems based on parallel kinematics architectures for all areas where specific solutions are either not available or not affordable. Fast and accurate machining systems for future manufacturing applications will be developed by combining the advantages of both robots and machine tools. The consortium consists of: Consiglio Nazionale delle Ricerche, Italy, Institutet fur Verkstadtsteknisk Forskning, Stockholm, Sweden, Katholieke Universiteit Leuven, Belgium, Ikerlan, Spain, Centre National de la recherche scientifique, Montpellier, France, WZL Aachen, Germany, Delcam PLC, UK, Technology transfer system PLC, Italy, Sulzer Electronics NTI, Switzerland and IFW, Germany.

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### **Machinability of extreme low-sulphur steels**

Steels with extreme low content of sulphur show a higher strength and fatigue strength compared with high sulphur steels. Due to the higher durability and reliability for motive engineering parts the industrial users are interested in reducing the content of sulphur in workpiece material.

Nevertheless, latest scientific research shows problems when machining low-sulphur steels, because a higher sulphur content in combination with Manganese causes greasing at the lip of the tool during the cutting-process. Hence, the friction is reduced between workpiece and cutting tool. Therefore, the tool life increases. Considering that this positive effect does not exist for extreme low-sulphur steels, other material treatments or manufacturing arrangements are necessary to improve the machinability of these materials.

The aim of the research at the IWT is to develop methods to improve the cutting results and reliability. Investigations on the machinability of the sulphur-low materials are carried out for the machining processes cutting-off, profile-turning, drilling and shaping.

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## ***Miscellaneous***

Several CIRP colleagues have worked closely together to obtain funding from the EC - in response to a Concerted Action proposal - to form euspen with effect from 1st October 1998. euspen is a not-for-profit society that will network industrial, academic and research practitioners in high and ultra-precision manufacturing throughout the European Union and the rest of the world. It aims to stimulate a wide range of EU transnational collaborative research projects and improve technology transfer through secondments between industry and universities and student exchanges- whilst disseminating state of the art knowledge to all its members. This will be done through awareness seminars, workshops and conferences. The first euspen international conference will be held in Bremen, May 31st - June 4th 1999.

euspen will work in close armony with CIRP especially through the appropriate STCs to widen its impact and influence on industry, research institutes and universities mainly in Europe.

Initially, the euspen headquarters will be at Cranfield University, GB with three regional centres in France, Germany and Italy. For any further information please contact the following:

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