



**The International Academy for Production Engineering**

# **NEWSLETTER**

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# From the President

Dear CIRP colleagues:

Time passes so quickly. The date for the 65th General Assembly to be held in beautiful historic Cape Town this August is rapidly approaching. Our colleague Prof. D. Dimitrov and his Organizing Committee team are now working diligently to resolve several remaining issues.

I visited Cape Town in April to observe preparations for the conference facilities, accommodations, the Farewell Dinner site, and the Accompanying Persons Program. The conference site, the Cape Town International Convention Centre, can be regarded as a world class facility for any type of conference, exhibition, or festival. All required rooms and facilities were found to be in the best condition, fully satisfying the GA requirements and standards. The Convention



Centre is situated in a very safe and clean area in Cape Town's Central Business District. All recommended hotels are within walking distance of the Convention Centre. Actually, I saw by chance the Queen Mary 2 at anchor. Some of her passengers stayed in one of the CIRP accommodations. The Farewell Dinner will be held in Allée Bleue, a historical wine estate established in 1690, nestled at the foot of the majestic Drakenstein Mountains in the scenic Franschhoek Valley. The Accompanying Persons Program is also planned along with beautiful scenic routes.

Cape Town is renowned as a historical area, not only for Republic of South Africa, but also for the rest of the world. In 1488, the first European to reach the cape, Bartolomeu Dias, named it the Cape of Storms. It was later renamed the Cape of Good Hope because of its opening of a sea route to India and the Orient. Subsequently, Vasco da Gama came to the area in 1498. Later, Magellan came in 1519–1521.

These achievements all took place during the Age of Exploration. Their purpose was discovery of an entirely new geographical world for Europeans, exploring a new frontier. Addressing our world challenge, which is more related to exploration of the frontiers of knowledge, CIRP is recognized a world-leading scientific academy. The coming GA in Cape Town is anticipated, with hopes of leaving an indelible academic footprint in the history of manufacturing science and technology, furthering value creation worldwide.

Looking forward to seeing you in Cape Town, August 23–29, 2015.

With warm and friendly regards,

Kanji Ueda  
President of CIRP  
2014–2015

# News about Members

## Professor Jack Hu elected as Member of the National Academy of Engineering



Professor Jack Hu elected as Member of the National Academy of Engineering “for methods for predicting and diagnosing root causes of product quality variation in multistage assembly systems”. Professor Hu is interim vice president for research, J. Reid and Polly Anderson Professor of Manufacturing Technology, professor of mechanical engineering, and professor of industrial and operations engineering, University of Michigan, Ann Arbor.

Jack has excelled in all phases of a faculty career: research, teaching and service. Some of his research was critical in the timely launch of the Chevy Volt automobile. In addition, Jack has held multiple administrative positions within the College of Engineering, including two different associate dean positions.

Election to National Academy of Engineering membership is one of the highest professional honors accorded an engineer. Members have distinguished themselves in business or academic management, in technical positions, as university faculty, or as leaders in government or private engineering organizations.

## Professor Yoram Koren Honorary Member of the Society of Manufacturing Engineers (SME).



SME Honorary Membership, 2015: “For your continued leadership that has been demonstrated through your significant contributions to manufacturing at local, national, and international levels. Your contributions enhanced progress and prosperity through manufacturing.”

Honorary Membership is the most prestigious honor presented by SME. It may be conferred upon an individual of internationally recognized ability and stature. Only four received this honor during the past 10 years worldwide.

The last recipient of SME Honorary Membership was Professor Hiroyuki Yoshikawa, past president of the University of Tokyo, in 2012.

See more at: <http://www.sme.org/honorary-members/#sthash.eEV1mQpZ.dpuf>

## **Professor Dong-Yol Yang (Dan) received the National Order of Science and Technology Merit**

Professor Dong-Yol Yang (Dan) has received the National Order of Science and Technology Merit (called as “Changjojang”) in April 2015. This is the highest Order for three persons every year given by the National Presidency of S. Korea.

One of the three persons is selected from researchers working in science and engineering including all professors and researchers in universities and research institutions. Professor Yang is an active faithful member of the STC-F and member of the Editorial Committee. He is known for his creativity and high level scientific work.



## **Professor Jean-Pierre Kruth receives 2015 Bower Science Award**

For his pioneering research in additive manufacturing (3D printing), which led to many technological innovations and several global companies. His work has inspired further research, enabled the creation of many patents, and built the foundation for others’ businesses. The prize has been handed over in Philadelphia, April 2015.



View this video at: <https://player.vimeo.com/video/126257165>

Most of the powerful new technologies that have revolutionized society over recent decades have been based in the intangible realm of digital ones and zeroes. Our microcomputers, smartphones, and GPS receivers have forever changed the ways we think, communicate, and get around, but have not directly affected our physical world. One notable exception concerns not merely the manipulation of data, but the creation of physically tangible objects—additive manufacturing (AM). Belgian engineer Jean-Pierre Kruth has spent much of his career bringing additive manufacturing from its origins in the 1980s to a vital and growing sector of 21st century industry.

As implied by its common name, 3D printing, additive manufacturing involves the creation of physical objects through the deposition of raw materials under precise control. Designs

consisting only of data in computer memory are transformed into tangible objects in the real world, just as a conventional printer translates a document from pixels on a screen into ink on printed pages. It works through a variety of specific processes, many of which Jean-Pierre Kruth has pioneered or perfected since earning his doctorate in 1979 at the Katholieke Universiteit Leuven (KU Leuven) in Belgium.

One of these is stereolithography, in which ultraviolet light is used to build up layers of photoreactive polymers. Kruth's early research led to large-scale "mammoth stereolithography machines" that enabled the quick and practical production of large single-part prototypes of objects such as car dashboards. In collaboration with the Zeneca corporation, he later extended this work to devise color stereolithography, in which an object can be made with differently colored sections to highlight various areas and features. This technique has proven particularly valuable in medicine, using computerized tomography or magnetic resonance imaging data to allow the rapid creation of 3D anatomical models of a specific patient so that doctors can plan complex surgical procedures in advance.

Kruth's research at KU Leuven spawned its first spinoff industrial concern in 1990, when he co-founded Materialise, Inc., which has since become one of the leading additive manufacturing companies in the world. Most recently, Kruth co-founded another company, LayerWise, which specializes in software and tools for other types of 3D printing processes used to produce metal parts, such as selective laser sintering/melting (SLS/SLM). These techniques, including the pioneering use of materials such as titanium, tungsten, and ceramics and the application of fiber lasers for SLS/SLM, were also perfected by Kruth and his research team.

Kruth is also one of the world's foremost researchers in metrology, the science of measurement, and its use in reverse engineering and quality control in parts manufacturing. His work in these areas resulted in the birth of yet another spinoff company, Metris, in 1995. Metris (renamed Nikon Metrology in 2009) develops software, techniques, and instruments for all kinds of industrial metrology applications including laser scanning, MRI/CT systems, microscopes, and even portable metrology devices. With Metris, Kruth is co-founder of three companies at the vanguard of the additive manufacturing discipline, a distinction no one else can claim.

Kruth's more than 500 papers, published in leading scientific and engineering journals worldwide, are among the most cited references in the AM field. As a KU Leuven faculty member since 1987, he has trained hundreds of the engineers and researchers who are now continuing to expand and extend the potential and power of additive manufacturing into the future.

Usually, the major contributions of researchers in most any field of engineering are concentrated in a single area: a particular technique, the invention of a specific device, or a similarly circumscribed focus. But Jean-Pierre Kruth's achievements range across the entire breadth of the burgeoning 3D printing industry, extending into related areas such as metrology and other industrial technologies such as laser cutting and electro-discharge machining. As 3D printing technologies transform industry, and ultimately our economy and culture, Jean-Pierre Kruth will continue to be recognized as the major innovator and researcher of the field.



# German Genealogy of CIRP

Our Past President, Professor Andrew Nee, recommended in 2012 that the CIRP national groups should consider establishing a genealogy for their particular country. A genealogy would nicely show the development of the CIRP members from the early days up to today and would give proof of the many interrelations, also across the CIRP member states. A first release is now online at:

[http://www.cirp.net/images/cirpfichiers/privatefiles/Directory/German\\_Family\\_Tree.pdf](http://www.cirp.net/images/cirpfichiers/privatefiles/Directory/German_Family_Tree.pdf)

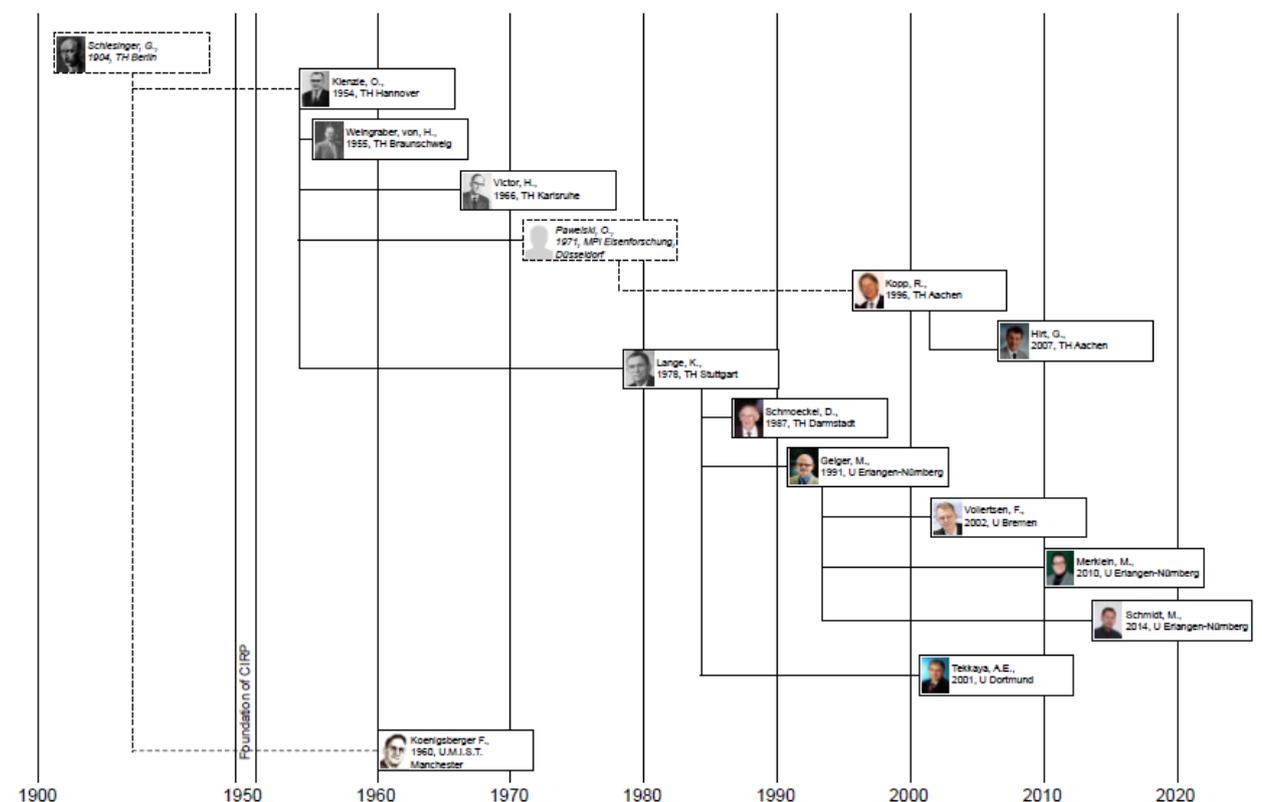
It shows the names, photos, and affiliation of German Fellows and Associate Members, their Ph.D. supervisors, and the year of acceptance as CIRP member. Those colleagues pictured in dashed frames have not been CIRP members, but were a supervisor of a member.

On behalf of CIRP I would like to express my special gratitude to our Past President Professor Hans Kurt Tönshoff, who gathered all the information needed and provided many photos, especially those of late colleagues from the early days.

As you will recognize, some photos are still missing and maybe the one or other data might need an amendment. CIRP members are therefore encouraged to give us their feedback and input to further optimize the German genealogy. Also, we would like to encourage other member states to work out their own national genealogy.

January 2015

Ekkard Brinksmeier



Example of German CIRP Genealogy (one page, out of twelve)

# From the Research Affiliates

It is a great pleasure for me to give a short update from the RA network. During the CIRP Winter Meeting 2015, the affiliates voted for a new board with Olga Battia (France) as Vice Chair, Taner Tunc (UK) as Secretary, and myself as Chair, and I would like to use this opportunity of the newsletter to thank Wessel Wits as former Chair again for doing an excellent and enthusiastic job within the last two years.

The new board is now looking forward to the next two years focussing on different activities to strengthen and benefit from the main characteristic of the RAs as a highly interdisciplinary network of young researchers having various backgrounds and coming from different countries. This will – for example – be a main topic during our **Annual Workshop 2015** which is hosted by the *Advanced Manufacturing Research Centre* – The University of Sheffield, England from 6<sup>th</sup> to 7<sup>th</sup> July (<http://www.amrc.co.uk/events/cirp-ra-2015/>). We are looking forward to discuss different research topics of the participating RAs in the technical sessions and also during our mini-workshop focussing on the preparation of a “Research Atlas”.

Following the idea of internationality and interdisciplinary, a new topic will be introduced during the RA meetings in Cape Town (**General Assembly 2015**). In addition to our interactive workshop sessions we’ll have a presentation about the hosting country in order to get to know how teaching and research is practised in South Africa.

And then we’ll have the **4<sup>th</sup> CIRPe Online Web Conference** (<http://cirpe2015.com>) entitled “Understanding the life cycle implications of manufacturing”. The topics are highly interdisciplinary ranging from (advanced) manufacturing technology, energy efficiency to human interaction. At the moment, the submitted papers are under review and we would like to thank all CIRP members participating in the review process. The conference will be conducted online from 29<sup>th</sup> September to 1<sup>st</sup> October and will be presented in different time slots so that people all over the world are able to attend the talks. The conference attendance is free of charge and you are all invited to follow and discuss the given presentations.

Furthermore, I would like to invite you to join our activities, e.g. our meetings during the GA 2015, or to discuss your comments and ideas for our RA network.

Petra Kersting  
(CIRP RA Chair)



Research Affiliates at the CIRP Winter Meeting 2015 in Paris

# Our Conferences

For the **most recent overview** of our coming conferences go to: <http://www.cirp.net/meetings-conferences/view-cat/year.listevents/2014/10/31/-html>

## Future Keynotes Papers

Our keynote papers are the result of an intensive collaboration between specialists working together during several years within an STC. They are important state of the art papers on important (new) technological areas. CIRP members who are willing to contribute are invited to contact the coordinator.

### 2016 Keynote Papers in preparation

**STC A; The Role of Manufacturing on the Social Dimensions of Sustainability - J. Sutherland (1) et al.** - Contact: [jwsuther@purdue.edu](mailto:jwsuther@purdue.edu)

**STC C; Cryogenically-Assisted Processing of Materials - I.S. Jawahir (1) et al.** - Contact: [jawahir@engr.uky.edu](mailto:jawahir@engr.uky.edu)

**STC Dn; Design for Additive Manufacturing – G. Moroni (2), M.K. Thompson –** Contact: [giovanni.moroni@polimi.it](mailto:giovanni.moroni@polimi.it)

**STC E; Machining of Engineering Ceramics by Electro-Physical Processes – E. Ferraris, B. Lauwers (1), J.P. Kruth (1)** - Contact: [Eleonora.ferraris@kuleuven.be](mailto:Eleonora.ferraris@kuleuven.be)

**STC F; Closed loop Control of Product Properties in Metal Forming - J. Allwood (1) et al.** - Contact: [jma42@cam.ac.uk](mailto:jma42@cam.ac.uk)

**STC G; Abrasive Fine-Finishing Technology – F. Hashimoto (1), H. Yamaguchi (2), K. Wegener (2), H.W. Hoffmeister, P. Krajnik, R. Chandhari, D. Dröder, F. Küster (3) –** Contact: [fukuo.hashimoto@timken.com](mailto:fukuo.hashimoto@timken.com)

**STC M; Chatter Suppression Techniques – J. Munoa (2), E. Budak (1)** - Contact: [jmunoa@ideko.es](mailto:jmunoa@ideko.es)

**STC O; Cyber-Physical Systems in Manufacturing – L. Monostori (1) B. Kádár (2), T. Bauernhansl, S. Kondoh (2), S. Kumara (1), G. Reinhart (1), O. Sauer (3), W. Sihn (1), K. Ueda (1) –** Contact: [monostor@sztaki.hu](mailto:monostor@sztaki.hu)

**STC P; Large-Scale Metrology - A new update – R. Schmitt (2), F. Härtig (3), W. Knapp (1), G. Goch (1), E. Morse (3), Hughes, T. Estler (1), M. Mitsubishi (1) –** Contact: [r.schmitt@wzl.rwth-aachen.de](mailto:r.schmitt@wzl.rwth-aachen.de)

**STC S; Mechanical Surface Treatments with guided Tools – V. Schulze (2), T. Altan (1), D. Axinte (1), F. Bleicher (3), P. Groche (1), Y. Pyun –** Contact: [volker.schulze@kit.edu](mailto:volker.schulze@kit.edu)

**Cross-STCs; Process Chains for Micro-Featured High Precision Components – E. Uhlmann (1), B. Mullany (2), D. Biermann (2)** - Contact: [eckart.uhlmann@ipk.fhg.de](mailto:eckart.uhlmann@ipk.fhg.de)

## 2017 Keynote Papers in preparation

**STC A: Innovative Control of Assembly Systems and Lines** - Jörg Krüger (2), Lihui Wang (2), Alexander Verl (2), Hoda ElMaraghy (1), Waguih ElMaraghy (1), Jörg Franke (2), Tullio Tolio (1), Dariusz Ceglarek (1), Günther Seliger (1), Christian Brecher (1), Sotiris Makris (2) - Contact: [joerg.krueger@tu-berlin.de](mailto:joerg.krueger@tu-berlin.de)

**STC C: Material and Friction data for Modeling of Machining Operations** (draft title) - S. Melkote (2), W. Grzesik (2) et al - Contact: [shreyes.melkote@me.gatech.edu](mailto:shreyes.melkote@me.gatech.edu)

**STC Dn: Design for Reduction of Energy use Consumption** - J. Duflou (1), L. Shu (1), G. Seliger (1), J. Srivastava - Contact: [Joost.Duflou@mech.kuleuven.be](mailto:Joost.Duflou@mech.kuleuven.be)

**STC F: Hot stamping of ultra-high strength steel parts** - K.I. Mori (1) et al - Contact: [mori@plast.me.tut.ac.jp](mailto:mori@plast.me.tut.ac.jp)

**STC M: Fluids and its impact on Machine Tools** - B. Kaftanoglu (1), K. Wegener (2) - Contact: [bilgink@atilim.edu.tr](mailto:bilgink@atilim.edu.tr)

**STC P: Contributions of Precision Engineering to the "New SI"** - H. Bosse (3), A. Balsamo (1), T. Estler (1), I. Robinson, M. de Podesta, H. Kunzmann (1), P. Shore (2), A. Donmez (2), J. Pratt - Contact: [Harald.Bosse@ptb.de](mailto:Harald.Bosse@ptb.de)

**Cross-STCs; Additive Manufacturing in Industry and Science - challenges and chances** - M. Schmidt (2), A. Huis in't Veld, M. Merklein (2) - Contact: [Michael.Schmidt@fau.de](mailto:Michael.Schmidt@fau.de)

# From the CIRP Office



*Chantal Timar-Schubert*

Annals papers/keynote papers submission process, CIRP meetings, the Website, candidatures for Membership, Internal Regulations and any internal information.



*Agnès Chelet*

Financial aspects: accountancy, membership fees, page charges, conferences sponsorships, Winter meetings registration + Agendas & Minutes of the scientific meetings.

Chantal Timar-Schubert and Agnès Chelet have now their own email address in order to simplify the contacts with the members, depending of the aim of your email:

Chantal Timar-Schubert: [chantal@cirp.net](mailto:chantal@cirp.net) – She is in charge of CIRP Annals' papers & keynote papers submission process, CIRP meetings in general, the Website, candidatures for Membership, Internal Regulations and any other internal information.

Agnès Chelet: [agnes@cirp.net](mailto:agnes@cirp.net) – She is in charge of the accountancy, membership fees, page charges, conferences sponsorships, Winter Meetings' registrations, as well as the collection of the Agendas & Minutes of the Scientific meetings.

However, the general email [cirp@cirp.net](mailto:cirp@cirp.net) is still working, and all the three email addresses are directed to the same mail box, as before.

## Future CIRP Meetings

### January meetings

17-19 February 2016, Paris

15-17 February 2017, Paris

### General Assemblies

23-29 August 2015, Cape Town, South Africa

21-27 August 2016, Guimaraes, Portugal

# New Books

## Handbook of Manufacturing Engineering and Technology



New Springer reference series on Manufacturing Engineering and Technology edited by A Y C Nee. with contributions of many CIRP Colleagues

Springer Reference Work provides overviews and in-depth and authoritative analyses on the basic and cutting-edge manufacturing technologies and sciences across a broad spectrum of areas. These topics are commonly encountered in industries as well as in academia. Manufacturing engineering curricula across universities are now essential topics covered in major universities worldwide

Volume 1: Forming and Joining

Volume 2: Machining and Tolerancing Systems

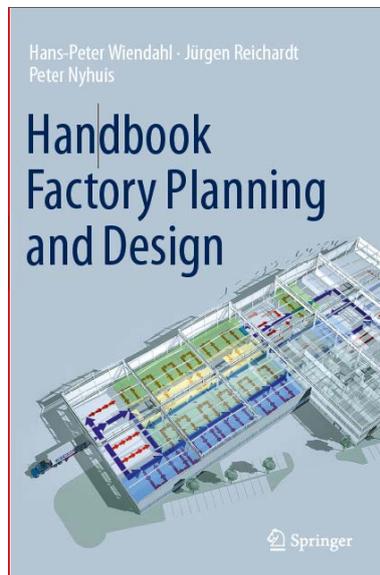
Volume 3: Nanomanufacturing and Non-Traditional Machining

Volume 4: Robotics and Automation

Volume 5: Additive Manufacturing and Surface Technology

Volume 6: Product Life Cycle and Manufacturing Simulation

## Handbook Factory Planning and Design



This handbook introduces a methodical approach and pragmatic concept for the planning and design of changeable factories that act in strategic alliances to supply the ever-changing needs of the global market.

In the first part, the change drivers of manufacturing enterprises and the resulting new challenges are considered in detail with focus on an appropriate change potential.

The second part concerns the design of the production facilities and systems on the factory levels work place, section, building and site under functional, organisational, architectural and strategic aspects keeping in mind the environmental, health and safety aspects including corporate social responsibility.

The third part is dedicated to the planning and design method that is based on a synergetic interaction of process and space.

The accompanying project management of the planning and construction phase and the facility management for the effective

utilization of the built premises close the book.

- Concise overview of manufacturing and logistics systems, and factory buildings and services.
- Introduction to changeability and application of change enablers.
- Proven guideline for the factory planner from goal setting to ramp up with the help of check-lists, tables and graphical illustrations.
- Description of integrated project management followed by facility management with due consideration for professional, organizational and environmental concerns.
- Case-studies and examples of changeable and communication friendly factories.

The Authors: Prof. Dr.-Ing. Dr. mult. h.c. Hans-Peter Wiendahl, Prof. Dipl.-Ing. Jürgen Reichardt and Prof. Dr.-Ing. habil. Peter Nyhuis.