



The International Academy for Production Engineering

NEWSLETTER

N° 59 – Autumn 2019

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From the President

Dear CIRP Colleagues,

It is a great honour for me to be appointed as the President of CIRP. I would like to express my sincere gratitude to the past presidents and my CIRP colleagues for recommending and allowing me to serve as President. I understand that the responsibility of the President is very heavy because the role that CIRP plays in the world is becoming more and more important.



Firstly, the 69th CIRP General Assembly in Birmingham was a very impressive event. The presentation by Professor Pat McKeown as the General Pierre Nicolau Award 2019 laureate was suggestive in the field of ultra-precision machine tools and associated nanometrology systems. Another big event during the Opening Session, which I suppose you remember well, was the piano playing with 88 pianists. It was an amazing setup using interesting mechanisms. You can enjoy it again on YouTube. On behalf of all CIRP members, I would like to express our sincere thanks to Professors Sein Leung Soo and Rajkumar Roy, and their team for organizing such a wonderful event. Next year we will meet in Paris and Munich. I will report on the preparation for the 70th CIRP General Assembly in Munich in the next newsletter.

Next I would like to describe the expected role of CIRP in society. An abundant future for our world depends on the realization of an inclusive society. Therefore, we must consider what kind of “value” we create and how emerging technologies such as Big Data should be handled to ensure an inclusive society. Until now, the problem has been what kinds of “goods” to manufacture and how to manufacture them. Now, we must consider how the new systems emerging from the Digital Revolution can help society to deliver goods and services to a broader spectrum of humanity, thereby for example, achieving Goal 12 of the United Nation’s Sustainable Development Goals (SDGs), which is “Responsible Consumption and Production,” to improve the quality of life of human beings. Of course, we have already started to discuss these issues in CIRP, but our contribution is increasingly crucial and more is expected of us than ever before.

With your help, my ambition is to renew CIRP by incorporating new research areas while maintaining a strong foundation in the traditional production technologies and academic research disciplines that must be handed on to the next generation. I also would like to make CIRP more visible and attractive, not only to the CIRP members, but also to those outside of CIRP. We can only accomplish this if we work together to make our society excellent for the future of the world.

I am very proud to be your President as we take on this important mission, working together with Board and Council members, including Professor Didier Dumur as Past President, Professor Hans Norgaard Hansen as Vice President and Professor Bert Lauwers as Vice President Elect, as well as the many other committees' members. Lastly, but most importantly is the support from our secretariat team, Professor Didier Dumur as Secretary General Treasurer, Ms. Chantal Timar-Schubert and Ms. Agnès Chelet.

I am looking forward to seeing you at the CIRP Winter Meeting in Paris.

With best regards,

Mamoru MITSUISHI
President of CIRP 2019-2020

From the editor

Dear CIRP colleagues,

It is a pleasure to present the next CIRP newsletter. Besides the well used CIRP website (www.cirp.net), the newsletter brings any kind of news from CIRP members and for CIRP members.

All kind of news (news from members, awards, books written by members,...) relevant for our CIRP academy, is always welcome. Organizers of CIRP conferences are invited to send a small report (high lights, pictures,..) that can be published in the newsletter. Input can be sent to the CIRP office (cirp@cirp.net) or directly to me (bert.lauwers@kuleuven.be).



I would also like to draw your attention to the (slowly) growing section on our web-site "Education Portal". The portal is meant to be a medium to share relevant information related to manufacturing education. Any member who wants to contribute to this education section is welcome to do so. Any relevant information can be sent to the CIRP Secretariat (cirp@cirp.net).



Furthermore, Prof. Tulio reminds us that the access to **CIRP Dictionaries of Production Engineering** and **CIRP Encyclopedia of Production Engineering** is free for CIRP members. Please visit

<https://www.cirp.net/info-on-cirp-publications/985-encyclopedia-2.html>



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THE INTERNATIONAL ACADEMY FOR PRODUCTION ENGINEERING

CIRP DICTIONARIES OF PRODUCTION ENGINEERING



The dictionaries of Production Engineering are written by CIRP members who are actively involved in research and belong to the Terminology Committee. They contain equivalent terms for the various production processes in English, German and French.

An edition of trilingual dictionaries (English–French–German) is being made (**information**).

Are already available:

- Metal Forming, Vol. I – 1 (1997)
- Metal Forming, Vol. I – 2 (2001)
- Material Removal, Vol. II (2004) (**extract**)
- Manufacturing Systems, Vol. III (2004) (**extract**)
- Assembly, Vol. IV (2012) (**extract online**)


Subscription

You can find more detailed information and **order directly online** on the publisher Springer-Verlag's website.

CIRP Members get a special discount (**look into your Dashboard**). Orders can be sent to:

CIRP Dictionaries of Production Engineering

C



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CIRP Encyclopedia of Production Engineering

2014 Edition | Editors: The International Academy for Production Engineering, Luc Laperrière, Gunther Reinhart

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Editors and affiliations

Bibliographic information

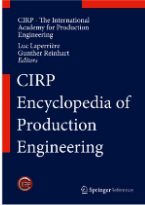
Front Matter PDF

A

Ability to Be Machined

Abrasive Grains

Introduction



The CIRP Encyclopedia covers the state-of-art of advanced technologies, methods and models for production, production engineering and logistics. While the technological and operational aspects are in the focus, economical aspects are addressed too.

The definitions and short explanations for a wide variety of terms were reviewed by the CIRP-Community, representing the highest standards in research. Thus, the content is not only evaluated internationally on a high scientific level but also reflects very recent developments.

99

8

1.3k

150k

Citations

Mentions

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Editors and affiliations

CIRP Encyclopedia of Production Engineering

News from Members

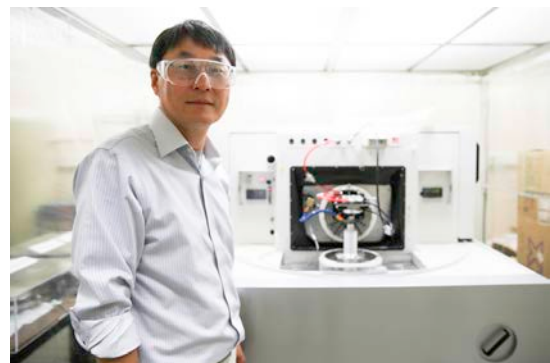
Professor Wertheim honored with the Fraunhofer Taler

On May 22, 2019, **Professor Rafael Wertheim** has been honored with the Fraunhofer Taler. Since the beginning of 2015, Prof. Wertheim has been supporting Fraunhofer Institutes in establishing business relationships as a Fraunhofer Senior Advisor Israel as well as scientific cooperation in Israel. He was significantly involved in setting up two Fraunhofer project centers at the prestigious Hebrew University Jerusalem and is currently building up a third project center on the Technion. Although Prof. Wertheim has long passed the retirement age, he is still actively involved in the international business of Fraunhofer. The Fraunhofer- Gesellschaft honors this great commitment to science, research and international cooperation with the Fraunhofer Taler.



Professor Min earns NSF CAREER Award

Professor Sangkee Min earned a National Science Foundation CAREER Award to support his research to develop new machining strategies for ceramic materials that would enable companies to adopt these materials for a wide variety of applications.



<https://min.me.wisc.edu/wordpress/index.php/news/min-earns-nsf-career-award-cutting-ceramics-loose-from-their-difficult-reputation/>

Professor Lin Li receives Donald Julius Groen Prize from Institution of Mechanical Engineers & the Prestigious Arthur L. Schawlow Award from Laser Institute of America

Professor Lin Li, was awarded the prestigious 2018 **Donald Julius Groen Prize** from the Institution of Mechanical Engineers (IMechE) on 16 October 2019 in London, for his “outstanding contributions to research and education in engineering innovations in mechatronics and manufacturing, and in particular for his leadership in laser based additive manufacturing”. The prize was presented to Professor Li by President of IMechE, Professor Joe McGeough. The Institution of Mechanical Engineers was established in 1847 and now has 120,000 members in 140 countries.



In addition, Professor Lin Li received the prestigious **Arthur L. Schawlow award** from the LIA (Laser Institute of America) in recognition of his pioneering research and development of laser based manufacturing processes and his entrepreneurial drive and vision to commercialize technologies. The award was presented to Professor Li by the LIA's Past President, Professor Milan Brandt at the (LIA) annual meeting held at the 38th International Congress on Applications of Lasers & Electro-Optics, in Orlando, USA, 9th October 2019.



Arthur Schawlow was a Nobel Laureate in Physics for his contribution to the development of laser spectroscopy. LIA established the Arthur L. Schawlow Award, since 1982, to recognize individuals who have made outstanding, career-long contributions to basic and applied research in laser science and engineering leading to fundamental understanding of laser materials interaction and/or transfer of laser technology for increased application in industry, medicine and daily life.



Professor Leach awarded the Finkelstein Medal

Professor Richard Leach from University of Nottingham has been awarded the Finkelstein Medal from the Institute of Measurement & Control for contributions to measurement internationally. The award ceremony was held at the Royal Institution in London.

The Finkelstein medal is awarded for notable contributions to measurement internationally — it's one of less than a dozen awards given each year by the Institute to recognise excellence and achievement in measurement and control.



Professor Gideon Levy becomes ninth inductee into TCT Hall of Fame

The Hall of Fame recognises those members of the additive manufacturing industry who have dedicated a lifetime of research, development, innovation and promotions of the technologies that have created and perpetuated dozens of new industries. Inclusion is based on strict criteria outlined by the TCT Expert Advisory Board which is comprised of leading industry experts, innovators and members of the TCT Group



<https://www.tctmagazine.com/tct-awards/tct-hall-of-fame/gideon-levy-ninth-inductee-tct-hall-of-fame/>
<https://tctawards.com/tctawards/en/page/hall-of-fame>

General Assembly 2019

The General Assembly 2019 held in Birmingham, UK, has been attended by **610 participants, including 172 guests and 53 accompanying persons**. Thanks to the UK delegation for the excellent organisation.

Pictures & Video's from the CIRP General Assembly can be viewed on the CIRP website (My Dashboard)

CIRP Awards

During the CIRP General Assembly, the **General Pierre Nicolau Award 2019** has been presented to **Professor Pat McKeown** for his outstanding contribution to the worldwide advancement of High Precision Engineering and its underlying sciences, helping to advance it into the realm of Nanoengineering. His work has led to world changing products. They range from fundamental developments of ultra-precision machine tools and associated nanometrology systems as applied to the manufacture of integrated circuits and large earth and space telescope optics (x-ray, 'optical' and infra-red) facilitating greater understanding of the structure of the universe.



McKeown's first CIRP paper, "Some Aspects of the design of High Precision Measuring Machines" Annals of the CIRP Vol 22/1 1973 (Tokyo) set out the basis of calculating and specifying the Volumetric Accuracy leading to the widespread use of 3D-error budgeting for error reduction in machine tools leading eventually to software error compensation techniques. Later papers set out the "The 11 Principles and Techniques for the Design of High Precision Machines" which became the basis for many professional development courses at Masters level through-out the world.

After 13 years in industry, namely with GSIP, based both in Geneva and the UK, he worked closely with his predecessor, Professor John Loxham CBE to launch Precision Engineering at Cranfield in 1968 having gained a major grant from the UK government, setting up the MinTech 'Industrial Unit' the Cranfield Unit for Precision Engineering [CUPE]. In 1987 this was re-structured into Cranfield Precision Engineering Ltd. a company owned by Cranfield University. In 1995 it became a division of what is today Fives Landis Ltd.

In 1987, the UK government, under its National Initiative on Nanotechnology, funded his proposal for the design and build of the NION NanoCentre, the world's most accurate diamond turning and grinding machine of its time for ultra-precision optics.

In 1996-98 he initiated the founding of Euspen working closely with CIRP colleagues, and was its founding president, gaining grant support from the European Commission for transnational R&D within the EU. It continues to grow in membership and success in promoting EU industry skills in this important field of advanced manufacturing technology.

Professor McKeown has received Lifetime Achievement Awards from the Japan Society for Precision Engineering, the American Society for Precision Engineering and euspen. Today he continues to promote to young people the attractions of careers in engineering and science through STEM courses and talks.

The F.W. Taylor Medal 2019 has been awarded during the General Assembly to **Dr. Benjamin Bergmann** (left on pictures), upon the proposal of Prof. Berend Denkena. He presented a paper on “Basic principles for the design of cutting edge roundings” at the STC-C during the CIRP General Assembly in Tokyo, Japan, in 2018.

His paper presents a novel and innovative approach for the design of cutting edge roundings based on the mechanical stress field within the interface between the cutting tool and the chip. In the presented study, the external mechanical load is investigated in direct relation to material properties by means of microcinematography. It could be shown that load characteristics are mainly material independent, whereas the load level depends on the machined material. Finally, the findings were transferred into a model, which enables the design of cutting edge roundings based on material properties.

Dr. Bergmann is head of department at the Institute of Production Engineering and Machine Tools (IFW) of Leibniz Universität Hannover.



ELECTIONS by the General Assembly 2019

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Prof. J.M. Lee (Korea)
Prof. L. Mathieu (France)
Prof. R. Shivpuri (India)
Prof. R. Züst (Switzerland)

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in February 2019

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Prof. A. Clare (UK)
Prof. K. Dröder (Germany)
Dr. R. Lupoi (Ireland)
Prof. J. Rech (France)
Prof. F. Tao (China)

in August 2019

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ZeMa (Germany)

Research Affiliates

in February 2019

Dr. F. Ducobu (Belgium)
Dr. M. Gyulai (Hungary)
Dr. E. Loukaides (UK)
Dr. P. Woizeschke (Germany)

in August 2019

Dr. B. Bergmann (Germany)
Dr. R. Bertolini (Italy)
Dr. M. Dalle Mura (Italy)
Dr. M.S. Kim (Korea)
Dr. M. Lai (China)
Dr.H. Li (China)

STC Officers (Chair - Vice-Chair - Secretary)

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Terminology Cttee : Prof. S. Chatti - Dr. M. Urgo

CIRP vision includes Environmental Sustainability

(By Prof. Didier Dumur, Past President)



A proposal initiated by Professor Altung one year ago, starting from the observation that the relevance for engineers to actively reflect on the consequence of engineering with respect to the natural environment or the earth's life support system is more urgent than ever before, recommended that environmental sustainability must be an integral part of CIRP's vision and mission. Based on that recommendation, a first decision was to update CIRP's vision as follows:

“To promote research and development among its members from Academia and Industry to contribute to environmentally sustainable global economic growth and well-being of society.”

Many activities achieved during the past years within STCs have been further recorded, and this vision towards environmental sustainability is one of the actions CIRP will clearly highlight in the future.

As mentioned in my presidential address during the opening session of the General Assembly in Birmingham last August, environmental sustainability must be considered when addressing important challenges for CIRP, as for example digital manufacturing: “... Digital manufacturing is one of the challenges that CIRP has to consider as a future perspective, to reach our goal to contribute to environmentally sustainable global economic growth and well-being of society”.

Consequently, the challenge of digital manufacturing – from the scientific and education point of view – must reflect the core concern of achieving a better and more sustainable future for all; this is in particular stated in the Sustainable Development Goals (SDGs) of the United Nations. Among the 17 goals mentioned by the United Nations, two are strongly related to actions CIRP has to undertake, which are already among the topics addressed, for example, during CMAG meetings:

- *“Goal #9: Industries, innovation and infrastructures – Build resilient infrastructure, promote sustainable industrialization and foster innovation ... Manufacturing is an important driver of economic development and employment ... Without technology and innovation, industrialization will not happen, and without industrialization, development will not happen”. However, this may be included within an environmentally sustainable development, and CIRP must play an active role in this field.*
- *“Goal #4: Quality education. Obtaining a quality education is the foundation to creating sustainable development. In addition to improving quality of life, access to inclusive education can help equip locals with the tools required to develop*

innovative solutions to the world's greatest problems". Educate students under specific consideration of sustainable development is a necessity and CIRP must be part of this challenge ..."

Therefore CIRP has currently an exciting and challenging opportunity to be active in the future addressing the challenge of environmental sustainability. This will be part of the work achieved in particular during the STC meetings.

Our CIRP Conferences

26th CIRP Conference on Life Cycle Engineering (May 2019, USA)

The 26th CIRP Life Cycle Engineering conference was successfully held at Purdue University from May 7 to May 9, 2019. The theme of this year's conference was "Advancing Industrial Sustainability." This theme addresses the continuing need – and opportunities – to seek harmony among industrial systems and the environment. The conference attracted 178 attendees from 21 countries., representing researchers from academia, industry, and government agencies. 164 manuscripts were submitted to the conference. After rigorous review, 131 papers were accepted, and 127 papers were presented at the conference. The conference had four parallel technical sessions with themes on eco-design and innovation, manufacturing processes, systems, and infrastructure, maintenance, life cycle assessment, circular economy, end of life management, product service system, and smart manufacturing. Nine papers were selected for the best paper competition and the presentations were judged by Professors Steven Skerlos, Paul Mativenga, Daniel Brissaud, and Yasushi Umeda. The paper entitled "Including Ecosystem Services in Life Cycle Assessment" by Xinyu Liu, Michael Charles, and Bhavik R. Bakshi of Ohio State University won the LEO Best Paper Award.

The opening ceremony, keynote speeches, and poster session were made open to the general public as part of Purdue's 150-year anniversary celebration. The theme of this year's LCE conference aligns perfectly with one of the topic areas of Purdue's year-long festival of ideas i.e. sustainable economy and planet. After conference chair Prof. Sutherland announced the opening of the conference, Dr. Tomás Díaz de la Rubia, Purdue Chief Scientific Officer and Senior Vice President of Strategic Initiatives gave a brief overview of Purdue's research efforts, especially Discovery Park and the Center for the Environment, and welcomed attendees to Purdue. This year's conference featured two keynote speakers, Dr. Wayne Eckerle,

Vice President of Global Research and Technology of Cummins Inc and Prof. Thomas E. Graedel, Iifon R. Musser Professor Emeritus of Industrial Ecology at Yale University and member of US National Academy of Engineering. In his talk, Dr. Eckerle summarized Cummins' efforts on promoting environmental sustainability, and approaches to increase energy, water, and material efficiency, reduce wastes, and contribute to circular economy via life cycle thinking. Prof. Graedel offered his insights on the two methodologies i.e. material flow analysis and life-cycle assessment widely used by the LCE community, and challenged the audience to think about structural choices and the supporting databases, and potential unification of two. These are key to increase confidence on the two methods and to better inform decisions made by corporations and governments. The poster session after the keynotes showcased 34 projects covering all the topic areas of the conference, which offered junior researchers an opportunity to interact directly with world renowned experts and their peers.

The conference offers numerous networking opportunities for attendees. In addition to coffee breaks between technical sessions, a welcome reception was held in the evening of May 6 and a networking reception on May 7. The conference dinner was held on May 8 at the Shively Club of Purdue's Ross-Ade Football Stadium. Professors Daniel Brissaud and Peggy Zwolinski introduced LCE 2020 which will be hosted by Grenoble INP from May 13 to May 15, 2020. After the technical program, about half of conference attendees went to one of two industrial tours: Subaru of Indiana Automotive and Caterpillar Large Engine Center.



Participants Networking at the Welcome Reception



Participants at the Networking Reception



Authors of LEO Best Paper Award Finalists Posing at the Conference Banquet



Technical Sessions



Poster Sessions

29th CIRP Design conference (May 2019, Portugal)

The 29th CIRP Design Conference was held from 08th to 10th May 2019, in Póvoa de Varzim, Portugal. The Conference represented an annual scientific meeting by the Scientific Technical Committee Design (STC Dn), in organisation by the Universidade do Minho, Portugal, and CATIM – Technological Center for the Metal Working Industry, Portugal. Conference Chairman was Prof. Goran D. Putnik (Universidade do Minho) and Conference Co-Chairman was Dipl. Eng. Hildebrando Vasconcelos (CATIM).

183 papers were presented, by 169 participants, from 27 countries from all 5 continents.

The Conference's objective was to provide an international forum of researchers, engineers, practitioners and CIRP members a place to share and discuss visions, state of the art and innovations in the field, to disseminate the recent advances, views and perspectives, and thus, to generate a significant impact on the future of design and engineering for products creation.

The Conference's second big objective was to provide a large space for collective learning, which was implemented through the innovative papers presentation format, so-called "Dialogue Sessions", through 3 sessions, in which the papers were presented by the papers' reviewers in order to promote a richer discussion and dialogue with the authors and other participants, to promote mutual learning and generation of ideas for future developments.

The scope of the 29th CIRP Design Conference, was to review and discuss the advances, research results and industrial improvements in the field of design and engineering for products creation, facing significant and radical societal and technical changes.

The theme of this year's conference was "Open Design and Design as Exponential Technology". This theme was selected to promote advanced topics in the context of new and emerging organisational and business models for design, and companies in general, and especially challenges of Industry 4.0 of which the exponential technologies are one of the most demanding features. The "Open Design and Design as Exponential Technology" theme was widely discussed through 3 Keynote Lectures, 2 Round Tables and a number of papers addressing this challenging and innovative subject.

Besides the conference main theme, many other design topics were addressed through the papers presentations and subsequent discussions. The topics addressed through the papers presentations have covered a number of co-called "regular design topics" but also a number of design innovative and advanced topics. Among the topics addressed, highlighted topics were related to Design for X, and in particular Design for Additive Manufacturing, as well as Digital Twin for Design, which will surely be the topics in focus for many future CIRP Design conferences, and which surely represent the design topics within the popular concept of Industry 4.0.



Plenary session



Parallel session



Discussion during coffee breaks



Social Events



Roud table



Discussions

11th CIRP Conference on Industrial Product-Service Systems (May 2019, Hongkong)

The 11th CIRP Conference on Industrial Product-Service Systems (CIRP IPS2 2019) was successfully held in Zhuhai and Hong Kong, China from 29th to 31st May 2019. Zhuhai City and Hong Kong are located on the two sides of Hong Kong–Zhuhai–Macau Bridge, which is the world's longest sea-crossing bridge. The first two days of the conference took place in Zhuhai while the last day took places in Hong Kong. Participants experienced two different cultures in one meeting.

The conference was hosted by Jinan University and the University of Hong Kong. CIRP IPS2 focused the theme on Smart Product and Service Twin and brought together both academic and industrial communities to address new challenges, share solutions, and discuss future research directions. It included keynote speeches, oral presentations and posters from 196 researchers from 18 countries or regions including China, Germany, France, Italy, Switzerland, Sweden, Finland, Singapore, Brazil, Canada, Japan, South Africa, Norway, Netherlands.

The opening ceremony of the conference was held in the Zhuhai Holiday Resort Hotel in the morning on 29th May. After Professor Ting Qu, Conference Co-Chair give a welcome speech, Professor Xianzhong Song, the president of Jinan University, Dr. Wu Yan, the deputy mayor of Zhuhai, professor József Váncza, the chair of STC O, CIRP and professor Yihua Liu, the executive vice president and Secretary-General, Guangdong Mechanical Engineering Society delivered opening speeches, respectively.

Eight distinguished researchers were invited to deliver keynote speeches focusing on the key issues and future development trends referring to the latest industrial product-service systems and smart service research findings.





The conference was organized around 21 sessions. A total of 12 awards were awarded by the Conference Awards Committee through rigorous assessment. This includes 2 Best Conference Paper Awards, 2 Best Student Paper Awards, 1 Best Application Paper Award, 1 Best Innovation Paper Award and 6 Merit Paper Awards.



Future CIRP Conferences

For the **most recent overview** of our coming CIRP conferences

Go to “EVENTS”→ [CIRP Conferences](#)

For the **most recent overview** of our coming CIRP sponsored conferences

Go to “EVENTS”→ [CIRP Sponsored Conferences](#)

CIRP Keynote 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 of each keynote paper.

2020 Keynote Papers

STC A

Absolute Sustainability - challenges to life-cycle engineering - M. Hauschild (1) et al. -

Contact: mzha@dtu.dk

STC C

Broaching: Cutting Tools and Machine Tools for Manufacturing High Quality Features in Components - P. Arrazola (1) - Contact: pjarrazola@mondragon.edu

STC Dn

A DfAM Framework for Metal Additive Manufacturing Processes - T. Vaneker (2) et al. -

Contact: t.vaneker@ctw.utwente.nl

STC E

Space Manufacturing - B. Hon (1) et al. - Contact: hon@liv.ac.uk

STC F

Damage in Metal Forming - E. Tekkaya (1) et al - Contact: Erman.Tekkaya@iul.tu-dortmund.de

STC G

Interactions of Grinding Tool and Supplied Fluid - C. Heinzl (2) et al. -

Contact: heinzl@iwt.uni-bremen.de

STC M

Energy Efficient Machine tools - B. Denkena (1) et al. - Contact: denkena@ifw.uni-hannover.de

STC O

Big Data Analytics for Smart Factories of the Future - R. Gao (1) et al. -

Contact: robert.gao@case.edu

STC P

Dimensional artefacts to achieve metrological traceability in advanced manufacturing - S. Carmignato (2) et al. - Contact: simone.carmignato@unipd.it

STC S

Manufacturing of Multiscale Structured Surfaces - B. Karpuschewski (1) et al. -

Contact: karpuschewski@iwt-bremen.de

Cross-STCs

Self-Optimizing Machining Systems – H.C. Möhring (2) et al. - Contact: hc.moehring@ovgu.de

Cross-STCs

Urban Production: State of the Art and Future Trends for Urban Factories - Christoph Herrmann (2), Max Juraschek, Peter Burggräf, Sami Kara (1)

2021 Keynote Papers proposals

STC A

Electronics Module Assembly - J. Franke (2) - Contact: Joerg.Franke@faps.fau.de

STC C

Structured and Textured Cutting Tool Surfaces for Machining Applications -

P. Mativenga (2), D. Biermann (1) - Contact: P.Mativenga@manchester.ac.uk

STC Dn

Co-evolution of digitalisation and Product Development Cycle - L. Roucoules (2) -

Contact: lionel.roucoules@ensam.eu

STC E

Ultrafast Laser Manufacturing: from physics to industrial applications - L. Orazi (2) -

Contact: leonardo.orazi@unimore.it

STC F

Forming of Metal-Based Composite Materials - S. Bruschi (1) -

Contact: stefania.bruschi@unipd.it

STC G

Grinding and finishing of automotive powertrain components - P. Krajnik (2) -

Contact: krajnik@chalmers.se

STC M

Noise and Vibration in Machine Tools - K. Wegener (1) et al. -

Contact: wegener@iwf.mavt.ethz.ch

STC O

Evolution and future of Manufacturing Systems - H. ElMaraghy (1) -

Contact: hae@u Windsor.ca

STC P

Scalability of Precision Design Principles for Machines and Instruments -

J.A. Yagüe-Fabra (2) et al. - Contact: jyague@unizar.es

STC S

Feature-based characterisation and applications - X. (Jane) Jiang (1) -

Contact: x.jiang@hud.ac.uk

2022 Keynote Papers proposals

STC A

Closed Loop Systems to Circular Economy: Staying within the Planetary Boundaries -

S. Kara (1) - Contact: S.Kara@unsw.edu.au

STC C

Process Monitoring of Machining - R. Teti (1) - Contact: roberto.teti@unina.it

STC Dn

Services-supported-by-Products Design Methods - D. Brissaud (1) -

Contact: daniel.brissaud@grenoble-inp.fr

STC E

Bioprinting: Materials, Processes and Applications - P. Bartolo (1) -

Contact: paulojorge.dasilvabartolo@manchester.ac.uk

STC F

Simulation of metal forming in a digitized era (sheet and bulk) - J. Yanagimoto (1) -

Contact: jun.52074.yanagimoto@cem.t.u-tokyo.ac.jp

STC G

Grinding tools and abrasives - A. Beaucamp (2) - Contact: beaucamp@me.kyoto-u.ac.jp

STC M

Mechanical Interfaces in Machine Tools - E. Budak (1) -

Contact: ebudak@sabanciuniv.edu

STC O

Daydreaming factories - A. Nassehi (2) - Contact: aydin.nassehi@bristol.ac.uk

STC P

Advances in performance and traceability of X-ray CT metrology - W. Dewulf (1) -

Contact: wim.dewulf@kuleuven.be

STC S

The implication and evaluation of geometrical imperfections on manufactured surface - B. Mullany (1) - Contact: bamullan@uncc.edu

2023 Keynote Papers proposals

STC Dn

Bio-inspired Design Architectures for Advanced Products Engineering - A. Malshe (1) -

Contact: apm2@uark.edu

STC M

Sensor and Actuator integrated tooling systems - F. Bleicher (2) -

Contact: bleicher@ift.at

From the Editorial Committee

(by Professor A. Erman Tekkaya (EC Chairman))

The Editorial Committee had also this year several changes. Our colleagues David Aspinwall, Daniel Brissaud, Tullio Tolio and Dong-Yol (Dan) Yang left the Editorial Committee. New members are Julian Allwood, Jozsef Vancza, Don Lucca and Nikolaos Michailidis. We are thankful for the contributions of the colleagues who left the Editorial Committee and say a warm welcome to our new members. I am looking forward to a fruitful joint work with them.



Prof. Tekkaya
EC Chairman

The 2019 EC review process

301 regular paper submissions (16 more than 2018) have been received this year. Including the Keynote and the Industrial Technical papers more than 740 (volume-I-equivalent-) reviews have been performed by the Editorial Committee. In addition, each STC-Chair and Vice-Chair reviewed and ranked all the paper submissions independently in their own STC. Hence, every paper submission received at least 4 independent peer reviews. Each paper was individually screened for original content using Ithenticate software. The Ithenticate scores ranged from 2% to 60% this year, with an average of 13% (an increase of 2% compared to 2018). Most of the papers with an Ithenticate score above 30% have been rejected due to unacceptable similarity with existing publications.

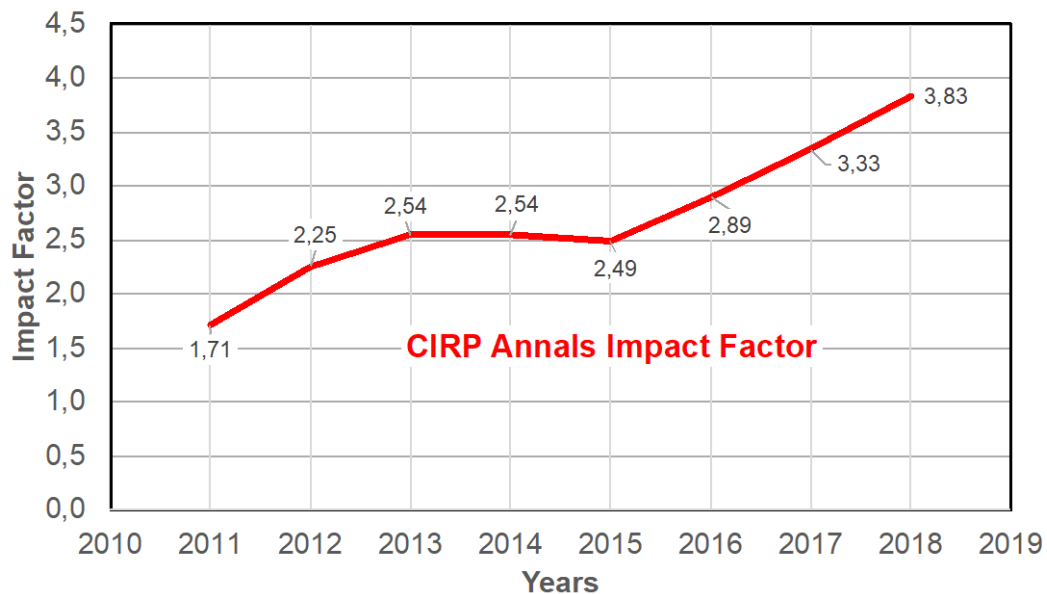
In all, 50% of the submitted papers have been accepted (2 % less than 2018); the acceptance rates over the STC varied from 40% to 67%. As in the past, the papers have been judged purely on quality, not on available presentation slots. 162 of 185 available regular slots have been filled this year.

Submitted and accepted regular papers in 2019 over the STC (three papers have been transferred to other STC's)

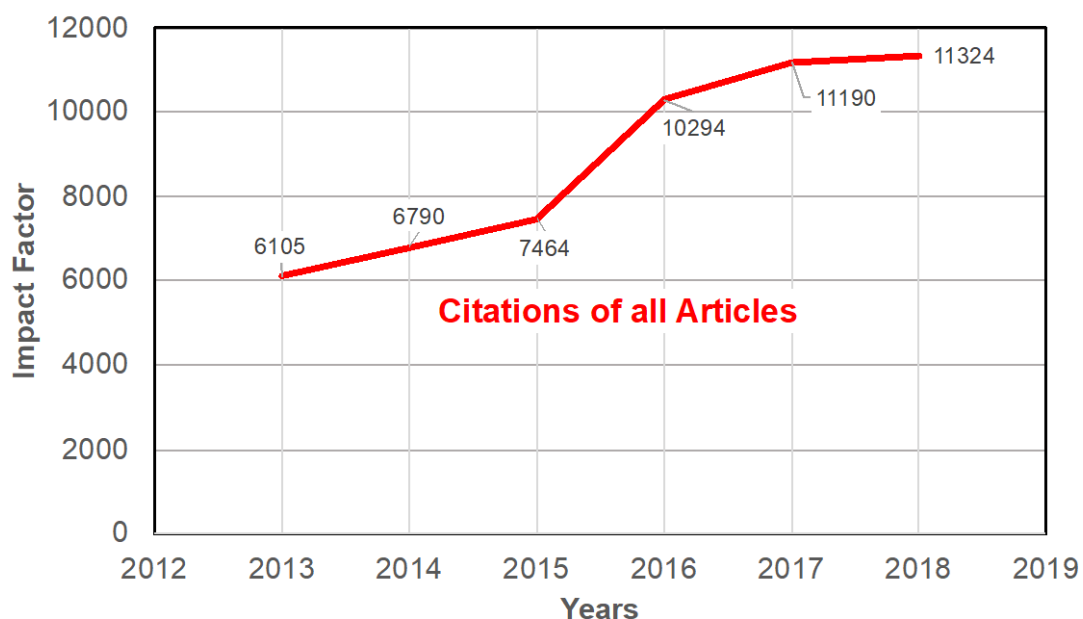
	Submitted Papers	Accepted Papers	Acceptance Rate
STC A	25	10	40%
STC C	37	20	54%
STC Dn	28	13	46%
STC E	39	21	54%
STC F	27	18	67%
STC G	23	12	52%
STC M	28	12	43%
STC O	38	18	47%
STC P	29	15	52%
STC S	27	11	41%
Overall	301	150	49.83%

3 Industrial Technical papers have been accepted for the special session before the CMAG meeting. 10 keynote papers from the STC's and 1 cross-STC-keynote paper have been reviewed.

The impact factor rose further to 3.83 in the year 2018, which verifies the high-quality reviewing process. The CIRP Annals have been ranked place 6 (place 8 in 2017) among 46 industrial engineering journals according to the Journal Citation Report by Clarivate Analytics.



The citations of all CIRP Annals papers raised to 11,324 in 2018. With 720,000, the 2018 downloads were about 70,000 more than in 2017. Until June 2019, the downloads were over 310,000, letting us to expect reaching the 700,000 mark in the year 2019 again.



The 2020 EC review process

320 abstracts have been accepted for 2020, which is about 1% less than last year. Ten STC-keynotes and two cross-STC-keynote have been received for reviewing.

This year the cooperative work papers have to be justified by objective criteria. It is requested to indicate for each section (theoretical and numerical/experimental) of the paper the methodical contributions of each CIRP member authoring the cooperative work paper that go beyond a service type of work (examples for service work: Standard material tests, simulations by commercial software, supplying test material, etc.). Also, for each author (not only the CIRP members) the CRediT – the Contributor Role Taxonomy, which captures the specific contributions of each author in the research article is requested. The new form is provided under:

https://www.cirp.net/images/cirpfichiers/publicfiles/Annals/declaration_of_interests.docx

Publishing in the CIRP Annals

The rules and criteria for judging the papers guiding the activity of the Editorial Committee are given in Article 20 of the Internal Regulations. In summary, the most important rules are:

1. The subject of the paper must fall within the scope of the activities of CIRP.
2. The paper must refer adequately to previous work in the field, in particular to the work of CIRP Members published in the Annals.
3. The content of the paper is not previously published in substantially the same form.

The basic criteria for judging the papers are:

- a) The work's value to industry.
- b) The contribution to knowledge within the scope of CIRP activities.
- c) The correctness of calculations and of the interpretation of the results obtained.
- d) The extent to which a balance is found in the paper between theory and supporting experimental evidence.
- e) The extent to which the work described is complete and how much further study and experimentation is required to make it a valuable contribution.

Generally, papers that excite our Academy, in my experience, are papers

- with novel ideas in technologies and fundamentals,
- that clearly described the own contribution,
- that present more than the application of known methods to another case study,
- that exhibit knowledge that is transferable and, hence, lifting the level of the whole field,
- that do not present salami slicing and black box applications.

Most of the papers submitted to the CIRP Annals are the best research papers of our Academy members and the sponsored authors. Despite this, some of these papers are rejected since the reviewing and publishing procedure of the CIRP Annals does not allow a “major” revision time wise. Therefore, it is not surprising that several of the rejected papers are published in strong journals. To support the major revision for such papers we will provide more detailed feedback for rejected papers this year.

Finally, we would like to thank all our Academy members for their diligent effort in preparing their papers and sharing their knowledge within the Academy.

From the CMAG Group

Dr. Ganiyusufoglu opened the CMAG meeting during the CIRP General Assembly in Birmingham. The meeting was well attended, almost 100 persons were there from all groups of CIRP family. 13 new Corporate Members (CMs) were welcomed thus comprising 169 CMs in total.

The meeting started with presentation of three Industrial Technical Papers (ITPs) in the morning session leading to good discussion. Pleasantly the papers were a good synthesis of industrial cases presented with academic backup, so fulfilling the spirit of ITPs.



Prof. Dumur (CIRP President) addressed the meeting and referred to the new CIRP web site emphasizing the importance of education. He expressed his appreciation that CMAG Group is paying high attention to education.

Two Company Presentations followed:

- Zygo Corporation was presented by Mr. Vivek Badami. The new corporate member is a global leader in the design and manufacture of advanced optical metrology systems, ultra-precise optical components and assemblies. Founded in 1970, and headquartered in Middlefield, Connecticut, ZYGO's global presence is supported by approximately 500 individuals.
- Index-Werke GmbH & Co., KG from Germany, another new CM, was presented by the CEO Dr. Dirk Prust. Founded in 1919 the company is a manufacturer of high sophisticated machines for turning operations. They have a broad product range from universal lathes up to turn/mill centers and multispindle lathes comprising gear cutting, grinding, lasering operations. The famous German lathe manufacturer Traub is also a member of Index Group.

The second session was based on Technical Presentations. They focussed on the theme of Sustainability, Education and Interaction between academy and industry. Dr. Ganiyusufoglu stressed as in the past once more the importance of United Nations' 17 Sustainable Development Goals (SDGs) and pointed out that Education is the most effective tool for increasing the awareness of sustainability in public. As known, actually CIRP included "Sustainability" into its constitution and will put more emphasis on the topic. As examples for interaction between academy and industry which is the core mission of CMAG two presentations were made:

- Prof. Bergs from WZL Aachen, Germany introduced with the title "Science Meets Industry" the International Center for Networked Adaptive Production. It is a setup where industry comes close to academy for absorbing actual research work and investigating the implementation for the own use.

- Prof. S. Ihlenfeldt from the Institute for Machine Tool Design and Adaptive Control – TU Dresden, Germany delivered a speech about Incremental Forming and Generative Manufacturing – A New Approach for Individualized Multifunctional Components presenting research work as answer to demands from the industry.

Finally Prof. G. Seliger from TU Berlin presented his visions and actions how education could contribute to “Sustainability”, how education methods should be modified for increasing the awareness of sustainability. As a global challenge he raised the question how to close the gap between developed countries and developing and emerging countries. As a concrete example for an initiative with this background he introduced the GPE – Global Production Engineering, an institution in Berlin for educating students especially from developing and emerging countries.

Closing the meeting Dr. Ganiyusufoglu thanked the Vice Chairmen Dr. Fujishima and Prof. Lauwers as well as the secretary Dr. Cotterell for their cooperation during his three years’ tenure as Chairman of CMAG.

In addition, the other CMAG members thanked Dr. Ganiyusufoglu, chair of the CMAG group, for his enthusiasm and efforts devoted to the CMAG group.

At the end of the meeting, new CMAG-officers (chair, vice-chair and secretary) have been elected. The CMAG board is complemented with council member Bert Lauwers.



Dr. M. Fujishima
Chair



Mr. Yavuz Murtezaoglu
Vice-chair



Dr. Luis Uriarte
Secretary

From the Research Affiliates

(input edited by Ray Y. Zhong)

Words from the RA Steering Committee by Roy Damgrave



Dear Research Affiliates and CIRP Colleagues,

The RA officers would like to thank you for the active discussions and productive collaboration within the entire CIRP network. Since our meeting at the GA in Birmingham there have been several activities that we would like to update you on in this CIRP newsletter.

During the RA meeting at the GA 2019 we had the election for the CIRP RA Steering Committee. Pinar Bilge was elected as the secretary, Vincent Wang was elected as the vice-chair and Roy Damgrave was elected as the chair. During this meeting 38 RA members were present, and as of November 2019, there are 99 RAs. Three former RAs have been recently elected as Associate Member: Eleonora Ferraris, Taner Tunc and Marcello Urgo.

The CIRPe 2019 – 7th CIRP Global Web Conference took place on October 16th-18th with the theme “*Towards shifted production value stream patterns through inference of data, models and technology*”. The conference was very well organized by Franz Dietrich (TU Berlin, Germany) and Nicole Krenkel (University of Kaiserslautern, Germany). All presentations were streamed via YouTube and can still be viewed via the homepage (<http://www.cirpe2019.com/>) and YouTube with a paper-based timestamp (https://www.youtube.com/watch?v=v-30AJ_RSqE&t=74s). Via this route we would like to thank the whole organizing committee for their excellent job. The CIRPe 2020 will be hosted by KU Leuven, Belgium and will be organized by Karel Kellens.

On the 26th-28th of June 2019, we had our annual RA workshop at the University of Twente, Netherlands. The theme of this workshop was “Virtual Dashboards”. The workshop also gave the opportunity for the collaborative discussions to progress (1: Digital Twin and Digital Transformation, 2: Material process chain and metrology, 3: Flexible production digitalised system, and 4: Sustainability of production systems). The next workshop in 2020 will be organized by Sébastien Campocasso (Universite de Toulon, France), the date for this event will be set soon.

We hope to meet you all at the next CIRP Winter Meeting and at upcoming CIRP events. We hope you will enjoy your RA experience and the collaboration within the CIRP community in 2020.

Roy Damgrave, on behalf of Vincent and Pinar

Collaborative work between RAs

Moderated discussion on “Sustainability impacts of assembly/disassembly systems” at the CIRP GA August 2019, STC A

This session was collaborated from Olga Battaia, Sebastian Thiede, Vincent Xi Wang, Pinar Bilge, Karel Kellens and Ray Y Zhong for discussing the sustainability impacts of assembly/disassembly systems. Olga introduced the topic, sustainable goals and three sustainability aspects from environmental, economic, and social. Sebastian, Vincent, and Pinar gave three talks on “Survey on the (social) sustainability of emerging smart production technologies”, “Sustainability considerations for electronic product assembly/disassembly”, and “Advances in disassembly and remanufacturing through digital assistance in the context of circular economy”. An online survey was conducted in this session with four technologies including human-robot collaboration, augmented reality, automated guided vehicle, and big data. The survey results were presented at the end of this session.



7th CIRPe Web Conference 2019

The annual CIRPe web conference series is an initiative by the CIRP Research Affiliates (RA) in form of a full-size online conference. Its main purpose is to disseminate scientific contributions of the CIRP RA group to a wide range of academic and industrial partners. The 7th CIRPe Web Conference 2019 focused on the theme of "towards shifted production value stream patterns through inference of data, models, and technology". This year's CIRPe Global Web Conference has seen a number of innovations.

Two “Highlighted papers” have been introduced. These papers are visible documentation of the collaborative efforts among groups of RAs. Both highlighted papers entitled “Shifting value stream patterns along the product lifecycle with digital twins” and “Highlights in Customer-driven Operations Management Research” were presented. These pointed out that common perspectives on upcoming research topics are established and disseminated not only within the RAs, but also into the world of CIRP and beyond.

This year's CIRPe was, for the first time, broadcasted completely live via YouTube. This has increased the accessibility of the contents a lot. The schedule was adjusted to the wide range of world time zones, from which attendants would join. The conference participation was free of charge. Everyone could post questions to the authors during the presentation video in the live chat on YouTube. The local organizing committee has collected and moderated the Questions & Answers session between the commenters and authors through voice or video call. The recorded videos are now available online via the homepage (<http://www.cirpe2019.com/>) and YouTube with a

paper-based timestamp (https://www.youtube.com/watch?v=v-30AJ_RSgE&t=74s) in order to optimize for search engines, to be referenced for further dissemination and public relations.

The organizing committee has received 72 abstracts and 52 full papers. 47 research papers were accepted for publication, which were selected and elaborated on the basis of 113 reviews. 9 sessions were held about the topics of “Shop floor operations”, “Form-based processes and metrology”, “Cutting”, “Grinding”, “Value Streams and Life Cycle Engineering”, “Automation Planning and Configuration”, “Robotics, Automation, and Assembly”, “Additive, Coating and Incremental Manufacturing”.

Organizing Committee:

Prof. Dr.-Ing. Franz Dietrich, RA, TU Berlin, Germany

Dipl.-Kffr. techn. Nicole Krenkel, RA, TU Kaiserslautern, Germany

Local Committee:

Dr.-Ing. Pinar Bilge, RA, TU Berlin, Germany

Dr.-Ing. Arne Glodde, TU Berlin, Germany



New books from RA's

Introduction to Advanced Manufacturing

Ramy Harik, Thorsten Wuest

Introduction to Advanced Manufacturing was written by two experienced and passionate engineers whose mission is to make the subject of advanced manufacturing easy to understand and a practical solution to everyday problems. Harik, Ph.D. and Wuest, Ph.D., professors who have taught the subject for decades, combined their expertise to develop both an applied manual and a theoretical reference that addresses many different needs.



Awarded RA's

2019 Taylor Medal was received by Benjamin Bergmann

The new RA Benjamin Bergmann won the Taylor Medal this year.

Best Conference Paper Award from 47th International Conference on Computer & Industrial Engineering (CIE47), 18-21 October, 2019, Beijing, China received by Dr. Ray Y. Zhong

Dr. Ray Y. Zhong, Research Affiliate and third author of the paper entitled “An Agile Product Development Methodology for Personalization under Industry 4.0” has

received the award of Best Conference Paper. The first author Mr. Shohin Ahelerooff is his PhD student co-supervised with Prof. Xun Xu from the University of Auckland, New Zealand.

The renowned Otto-Kienzle commemorative medal from the Scientific German Academic Association for Production Technology (germ. WGP) received by Dr.-Ing. Ivan Iovkov

The young researcher Dr. Ivan Iovkov received the renowned Otto-Kienzle commemorative medal from the Scientific German Academic Association for Production Technology (germ. WGP). During the annual congress, WGP Executive Committee member Prof. Peter Nyhuis presented the exceptional scientist with the award: "With his scientific acumen and interdisciplinary thinking, Dr. Iovkov has not only shown new paths for machining production in his dissertation. Already during his studies, he developed innovative methods for more efficient production, which have already found international recognition and entry into industry".

Nominations – August 2019

Total RAs 99 @ August 2019

New RAs

- Benjamin BERGMANN (Germany)
- Rachele BERTOLINI (Italy)
- Michela DALLE MURA (Italy)
- Min-Soo KIM (Korea)
- Min LAI (China)
- Haonan LI (China)

RAs ending their term:

- Kolja ANDREAS (Germany)
- Hongrui CAO (China)
- Jos DE LANGE (Netherlands)
- Yangjin KIM (Korea)
- Toru KIZAKI (Japan)
- Ryo KOIKE (Japan)
- Michael LECHNER (Germany)
- Khaled MEDINI (France)
- Ahmad SADEK (Canada)
- Christopher SALDANA (USA)
- Marco SORGATO (Italy)
- Rong SU (UK)
- Wahyudin Permana SYAM (UK)
- Florian WELZEL (Germany)
- Huajun CAO (China)
- John Ahmet ERKOYUNCU (UK)
- Peter KINNEL (Germany)
- Antonio MAFFEI (Sweden)
- Paolo Claudio PRIARONE (Italy)
- Frederik ZANGER (Germany)

From the CIRP Office



Chantal Timar-Schubert

Annals papers/keynote papers submissions follow up, CIRP meetings, CIRP Website, candidatures for Membership, Internal Regulations and any internal information.



Agnès Chelet

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

News

- Information and registration to the next [CIRP Winter Meetings](#) is ready online on the Website (from the Home Page or through "EVENTS"). We suggest you book quickly your hotel in Paris to have cheaper prices online.
- New Guests policy: only STC Boards (as well as CWG and CMAG Boards) can invite up to three guests to participate in their meeting - No other guests by any members are allowed from now on during the Winter Meetings. Corporate members can have two representatives attending the Winter meetings.

Updated CIRP Regulations

Modifications voted at the last General Assembly in Birmingham:

Art.23 - RA Program. *Nominations will now be made once a year:* "The annual deadline for nominating a candidate is **June 1st** for the candidature to be considered at the General Assembly."

Article 5 – Fellows

5.11 – *This sentence was missing in the I.R.:* "Fellows have all voting rights at the General Assembly Meeting."

Article 15.2 Organization of the STCs

New procedure for the election of STC Boards. [See online](#).

Future CIRP Meetings

Dates of the [future CIRP Winter Meetings](#) 2020 - 2025

Dates of the [future CIRP General Assemblies](#) 2020 - 2023