



The International Academy for Production Engineering

NEWSLETTER

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From the President

Dear CIRP Colleagues,

Many people in the world have been suffering from the novel coronavirus for the past year. It is far from being over although the development of the vaccine and the carrying out of the vaccination are believed to be improving the situation. The paradigm is shifting at an increasing tempo where the importance of technology is rapidly growing for sensing in the physical space, digitalization such as IoT, AI and DX, and the usage of cyberspace, including the hardware development for semiconductor and communication equipment.



The importance to protect the global environment has not been changed even under the coronavirus situation. I thought that the movement of decarbonization would decelerate under this situation. However, contrary to my expectations its progress has been accelerating. It is said that we have now entered the Anthropocene, which is the geologic age where human activity affects the entire earth system. There is a possibility that unrecoverable environmental changes will occur if the tolerance limits are exceeded for nitrogen cycle, climate change and biodiversity loss. The realization of carbon neutral in 2050 was declared at the Paris Agreement. It is also said, however, that the irreversible environmental destruction will occur if we do not reduce by half the greenhouse gas emissions by 2030. We actually have only 10 years left.

I think CIRP should take the initiative to provide a solution for this issue and play the initiator collaborating with other institutions as a leading international academy in production engineering, which consists of more than 600 members from 50 countries. I believe that we could unite and discharge our responsibility with the cooperation of all members.

I guess that many people have re-recognized the value of face-to-face communication under coronavirus situation which CIRP has cherished so far. Mutual trust and empathy are important for the community. It is the same for CIRP. I hope that CIRP would contribute to Sustainability and SDGs by recovering the physicality, which was lost with the communication in cyberspace, effectively using advanced information interface and media, which are research topics in themselves and even though still under development.

With best regards,

Mamoru MITSUISHI
President of CIRP 2019-2021

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 Technical Secretary

Special thanks to the many CIRP conference organizers to respond to the request to submit a brief report of the highlights of the conferences to be included in the newsletter. A brief report of eight organized conferences is included in this issue.

Bert Lauwers
CIRP Technical Secretary



News from Members

Order of Canada awarded to Professor Hoda ElMaraghy

Professor Dr. Hoda ElMaraghy has received Canada's highest civilian honor, the Order of Canada. "This honor, one of the highest in the country, has been conferred upon you by Her Excellency the Right Honorable Julie Payette, Governor General of Canada. It is a testament to your outstanding achievement and service to the nation".

The official announcement from Rideau Hall in Ottawa, was made on 27 November 2020. The investiture ceremony in Ottawa will be held at a later date.

Professor ElMaraghy is a renowned scholar and research innovator, an inspiring educator, leader and role model, whose seminal contributions in manufacturing systems research have been recognized nationally and internationally with numerous prestigious awards and accolades. Her vast contributions to modern manufacturing systems' paradigms, flexibility and changeability have changed the way factories are currently designed and operated.



<https://www.gg.ca/en/activities/2020/governor-general-announces-114-new-appointments-order-canada>

Professor Sung-Hoon Ahn elected as President of the Academic Society for Appropriate Technology and Associate Member of National Academy of Engineers of Korea



Professor Sung-Hoon Ahn at Seoul National University, Korea was elected as the President of the Academic Society for Appropriate Technology (ASAT). The society covers wide areas of engineering and technology such as manufacturing, energy, environment, architecture, ICT, water, agriculture, medical-health as well as less-technical areas including, climate change, education, regional development, international cooperation, and official development assistance (ODA). Although the appropriate technology has been historically applied to developing countries, he proposed a new application of appropriate technology to smart manufacturing for small and medium enterprise (SME). Using this Appropriate Smart Manufacturing approach, multifunctional sensor, edge computing with low cost IoT, small data

with data reduction, and appropriate AI have been applied to SMEs of Korea.

In January, he was also elected as the associate member of The National Academy of Engineering of Korea (NAEK), a leading group of engineering technology whose members have made remarkable contributions to the technological development in universities, companies, and research institutes. NAEK mediates between government and society, proposes effective policies on social issues related to industrial and engineering, and create sound public opinion.

Professor Ahn's research interests include smart factory, sensor, soft robotics, additive manufacturing, green manufacturing, and renewable energy. His major awards include Sinyang Engineering Award, Gaheon Award, Seoul National University Education Award, LG Yonam International Visiting Fellowship, Minister's Commendation from Ministry of Science, ICT and Future Planning of Korea, and Presidential Commendation of Korea. He is the editor-in-chief of the International Journal of Precision Engineering and Manufacturing - Green Technology and Outside Director of Hyundai WIA Corporation.

Within CIRP, his major STCs are S and E.

CIRP virtual

CIRP 2020 video paper sessions

Due to the worldwide pandemic, the General Assembly 2020 has been postponed to the upcoming General Assembly 2021, to be organised by the Munich team, but still in an on-line mode. The decision was made to have all 2020 papers presented through video paper sessions, embedded within the CIRP website and complemented with a forum for discussions between authors/presenters and CIRP members and guests.

The 2020 video paper sessions were viewed by about 440 viewers. Together they viewed around 3180 presentations, over a time frame of about 35 days. Interesting to indicate that the maximum views for one of the presentations was 72.

CIRP 2021 winter meeting

The CIRP 2021 winter meetings were organised using the ZOOM platform. Most of the meetings (STC, WG,..) were organised from Monday till Friday, and scheduled each day from 13:00 till 16:00 (CET) in order to accommodate most of the participants to have their meetings at a reasonable time during the day.



CIRP VIRTUAL WINTER MEETINGS LIVE - 15-19 February 2021

For the 2021 winter meeting, 363 CIRP members, 65 RA's and 36 guests were registered, giving a total of 464 participants.

ELECTIONS by electronic votes for the General Assembly Meeting 2020

2019-2021 Board and Council members (no movement in 2020)

President	Prof. M. Mitsuishi
Vice President	Prof. H. Hansen
Vice President Elect	Prof. B. Lauwers
Past President	Prof. D. Dumur
Secretary General	Prof. D. Dumur
Treasurer	Prof. B. Lauwers
Technical Secretary	Prof. J. Aurich
Council Members	Prof. A. Balsamo
	Prof. S. Kara
	Prof. M. Kunieda
	Prof. E. Lutters
	Prof. S. Smith

Fellows

Mr. D. Barrenetxea (Spain)
Dr. B. Kadar (Hungary)
Prof. T. Kaihara (Japan)
Prof. G. Lanza (Germany)
Prof. R. Leach (UK)
Prof. P. Martins (Portugal)
Prof. G. Stepan (Hungary)
Prof. S. Takahashi (Japan)

Associate Members

in February 2020

Dr. A. Caggiano (Italy)
Dr. D. Djurdjanovic (Serbia)
Dr. R. Hood (UK)
Dr. R. Koike (Japan)
Dr. D. Kono (Japan)
Dr. G. Michalos (Greece)
Dr. C. Okwudire (USA)
Prof. P. Wiederkehr (Germany)
Dr. F. Zanger (Germany)
Dr. X.Q. Zhang (China)
Prof. W. Zhao (China)

in August 2020

Dr. T. Furushima (Japan)
Dr. P. Priarone (Italy)
Dr. F. Pusavec (Slovenia)
Dr. Y. Zhang (France)

Fellows Emeritus

Prof. T. Aoyama (Japan)
Prof. L. De Chiffre (Denmark)
Prof. K.I. Mori (Japan)
Prof. H. Shinno (Japan)

Corporate Members

Framatome (France)
M.K. Morse (USA)
MTU Aero Engine (Germany)
Siemens Digital Industries (Germany)
Third Wave Systems (USA)

Research Affiliates

Dr. V. Alfieri (Italy)
Dr. S. Bapat (USA)
Dr. C. Courbon (France)
Dr. N. Geier (Hungary)
Dr. D. Kozjek (Slovenia)
Dr. J. Lohmar (Germany)
Dr. M. Magnanini (Italy)
Dr. K. Mori (Japan)
Dr. Y. Quan (Korea)
Dr. D. Xu (UK)
Dr. J. Yang (China)

New STC Officers

No movements in 2020

From the Editorial Committee

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

The Covid-19 pandemic precluded not only the physical General Assembly 2020 in Munich, but also the physical Winter Meeting in February 2021 and hence a face-to-face Editorial Committee Meeting. Still, it was possible to perform timely the reviewing process at the usual high quality. This was possible through the change of the reviewing system from the manual procedure to the digital one embedded completely in the Editorial Manager of Elsevier. The decision of making this move has been given during the Winter Meeting in 2020 with the intention to lift reviewing of papers within our Academy to an advanced contemporary level. Amid the pandemic, it turned out that the new system enabled an efficient digital reviewing, allowing us to publish our CIRP Annals this year again and even earlier than in the past years.



The Editorial Committee had in the last year only few changes. Our colleague Masayuki Nakao left the Editorial Committee. We are thankful for his contributions. Jian Cao is the new EC-member. A warm welcome to her. With Jian we have now besides Jane Jiang the second female member in Editorial Committee. Though we have now the highest female proportion with 14% in the history of the EC, still there is some space for improvement in this regard.

The 2020 EC review process

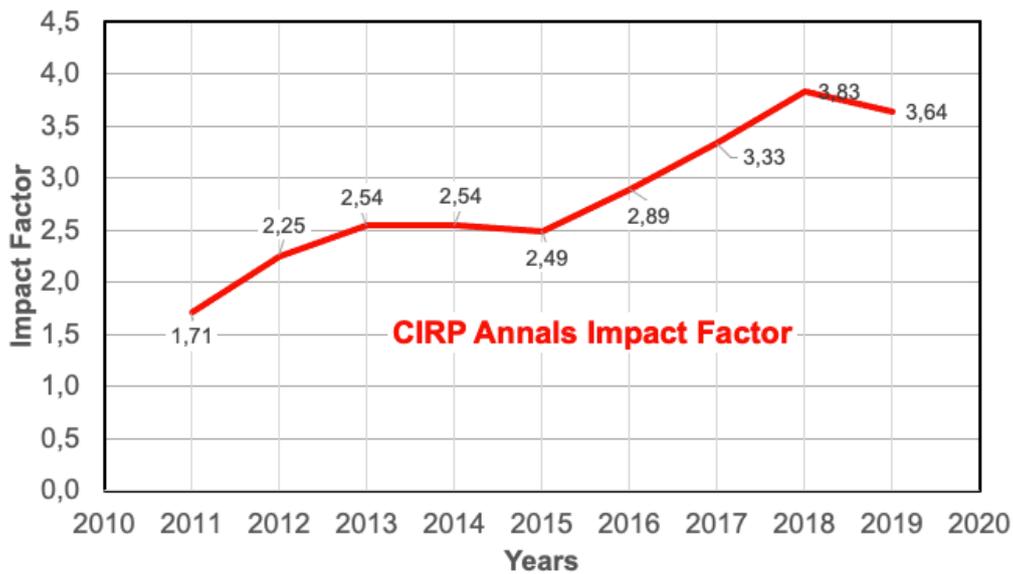
329 abstracts were submitted and about 10% have been withdrawn not leading to a paper submission. Hence, 296 regular paper submissions (5 less than 2019) have been received 2020. During the paper submission, 2 submitted papers change their STC. 33 papers were cooperative work papers and 59 submissions have been sponsored. Including the 12 Keynotes and the 6 Industrial Technical papers more than 628 (volume-I-equivalent) reviews have been performed by the Editorial Committee in the old manual system. 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 57% with an average of 10% (a decrease of 3% compared to 2019). Again, most of the papers with an IThenticate score above 30% have been rejected due to unacceptable similarity with existing publications.

In all, 45% of the submitted papers have been accepted (5% less than 2019); the acceptance rates over the STC varied between 37% to 60%. As in the past, the papers have been judged purely on quality, not on available presentation slots. Only 144 of 182 available regular slots have been filled in 2020.

**Submitted and accepted regular papers in 2020 over the STC
(one has been transferred to another STC and two to CMAG)**

	Submitted Papers	Accepted Papers	Acceptance Rate
STC A	27	10	37%
STC C	39	18	46%
STC Dn	25	10	40%
STC E	52	23	44%
STC F	21	10	48%
STC G	17	8 (7)	47%
STC M	27	12	44%
STC O	38	17	45%
STC P	25	15	60%
STC S	25	10 (11)	40%
Overall	296	133	44.93%

The impact factor dropped slightly to 3.64 in the year 2019. Based on an estimation of Elsevier we expect a slight increase of the impact factor for 2020.



The 2021 EC review process

No abstracts have been submitted in the new reviewing system this year. 232 regular paper submissions (64 less than 2020) for Volume-I have been received in 2021. The drop of 22% in submitted papers is attributed to the pandemic. 17 papers (7% of all submitted papers) were cooperative work papers and 44 submissions (19%) have been sponsored. For the first time, no Industrial Technical Paper for the CMAG session has been reviewed by the EC as this is now done by the STC's. The IThenticate scores dropped this year compared to previous years significantly.

In all, 50% of the submitted papers have been accepted (5% more than 2020); the acceptance rates over the STC varied also this year between 37% to 60%. 136 of 186 available regular slots have been filled in 2021.

Submitted and accepted regular papers in 2021 over the STC (one has been transferred to another STC and one to CMAG)

	Submitted Papers	Accepted Papers	Acceptance Rate
STC A	19	7	37%
STC C	30	18	60%
STC Dn	21	11 (10)	52%
STC E	39	16 (17)	41%
STC F	24	14	58%
STC G	14	8	57%
STC M	21	12	57%
STC O	31	15	48%
STC P	16	8	50%
STC S	17	7	41%
Overall	232	116	50.0%

The new Reviewing System

The move from the manual reviewing to the new reviewing system embedded entirely in the Editorial Manager of Elsevier aims to increase efficiency, reliability, flexibility, quality and transparency of the reviewing. The most significant changes in the new system are:

- *Increase of efficiency:* The abstract submission has been cancelled allowing the reduction of workload of the EC and the Paris Office. Only a single paper has been withdrawn reducing further the workload. Also, the "ranking" of the papers by the STC-Chair and Vice-Chair has been cancelled this year reducing the workload of the STC-Officers. Another important advantage of the EM is that default or tailored reports can be easily and quickly generated automatically by the system. The legendary "magic sheet" could be replaced

completely by these always-accessible automated reports of EM. Finally, the “Joint Program Meeting” has been removed.

- *Increase of reliability:* All reviews have been entered via the Editorial Manager (EM) of Elsevier. All communication is done through the EM: All the letters to the authors or reviewers are sent by the system mostly automatically. This reduced significantly the inevitable human mistakes.
- *Increase of quality:* The decision option “doubtful” has been removed in the new system. All reviewers had to make a clear recommendation for accepting the paper (with minor revisions) or rejecting it. This led to a slight reduction of conflicting decisions and increased the quality of the assessment. The quality of the reviews could be also increased by allowing every reviewer to place the comments in a “to the author” and/or “to the editor” box. Adding attachments from the reviewers and passing them to the authors is straightforward in EM allowing much more information transfer to the authors.
- *Increase of transparency:* The algorithmic EM prevents the handling or insight to the review process of own papers of the EC-members or the STC-officers. Further, every reviewer could read upon submission of her/his review the reviews of the other reviewers. Every reviewer received a copy of the draft and the final decision letters. Finally, all the reviews and decisions are saved in the EM and can be accessed in cases of doubt.
- *Increase flexibility:* The option to invite CIRP fellows outside the EC and the STC-officers allows to ask for reviews if for instance one STC Chair or Vice-Chair cannot review her/his own submission or if expertise is missing in the EC on a very particular subject. This year we invited 4 external CIRP Fellows to review various papers. Their reviews were of high quality, timely and helpful in making the final decisions. It is expected that this option of external reviewers will be used more extensively in the coming years. An important effect of these invitations is that more colleagues in the Academy are involved in the assessment of papers increasing the acceptance of the evaluation process among colleagues.

For this special year of the pandemic, no physical EC meeting has been held. Instead, the Editorial Committee could meet in several Zoom-meetings. Though, not essential, the general perception is that a physical editorial committee meeting would be still helpful. We expect that in the next years the physical meeting of the Editorial Committee in Paris can be reduced to a single day or at most to two days.



The old good time



The era of Zoom

As the Chair of the Editorial Committee, I would like to thank sincerely all colleagues who have supported this smooth and successful transition of the reviewing system. Especially, I would like to thank Chantal Timar-Schubert (CIRP Head Office), Suzan Hurren (Elsevier), Timo Bazuin (Elsevier), all STC Chairs/Vice-Chairs, the external reviewers and finally all the members of the Editorial Committee for their great support and trust but also the significantly increased workload they have provided this year. I would like to thank also all the authors for their patient and great discipline using the EM.

With this new reviewing system, the CIRP Annals are ready for further evolutions increasing the scientific impact of our Academy. One possible improvement could be the possibility to have major revisions (and hence increasing the acceptance rates) but also to have a more generous time frame for paper submissions.

Finally, we would like to thank all our Academy members for their diligent effort in preparing their papers and sharing their knowledge with the production community. It is an honor and pleasure for all of us of the EC to serve you.

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.

2021 Keynote Papers under press

STC A

Electronic 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 digitalization, organizations 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 Parts - S. Bruschi (1) - Contact: stefania.bruschi@unipd.it

STC G

Grinding and fine finishing of future automotive powertrain components - P. Krajnik (2) - Contact: krajnik@chalmers.se

STC M

Noise and Vibration in Machine Tools - K. Wegener (1) - Contact: wegener@iwf.mavt.ethz.ch

STC O

Evolution and future of Manufacturing Systems - H. ElMaraghy (1) - Contact: hae@uwindsor.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 characterization of surface topography and its application - 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

Designing Value-Driven solutions: The Past and Future of Industrial Product-Service Systems - D. Brissaud (1) - Contact: daniel.brissaud@grenoble-inp.fr

STC E

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

Contact: paulojoerge.dasilvabartolo@manchester.ac.uk

STC F

Simulation of metal forming - Visualization of Forming Phenomena in a Digitized Era

J. Yanagimoto (1) - Contact: jun.52074.yanagimoto@cem.t.u-tokyo.ac.jp

STC G

Advances in 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 metrological X-ray computed tomography - 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

Cross-Keynote

Vision on Metal Additive Manufacturing: Challenges and Future Trends - A. Bernard (1)

Contact: Alain.Bernard@ec-nantes.fr

2023 Keynote Papers proposals

STC A

Automated Assembly of Non-Rigid Objects - S. Makris (2)

Contact: makris@lms.mech.upatras.gr

STC C

Digital Twin for Cutting Processes - T. Bergs (2)

Contact: t.bergs@wzl.rwth-aachen.de

STC Dn

Biologicalisation of Designs for Advanced Products - A. Malshe (1)

Contact: amalshe@purdue.edu

STC E

Digital Twin for Electro-Physical and Chemical Processes - Y. Guo (1)

Contact: yuebin.guo@rutgers.edu

STC F

Plasticity und future of stress superposition in metal forming - E. Tekkaya (1)

Contact: Erman.Tekkaya@iul.tu-dortmund.de

STC G

Abrasive machining of composites - B. Zhang (1)

Contact: zhangb@sustech.edu.cn

STC M

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

Contact: bleicher@ift.at

STC O

Platform based manufacturing - T. Tolio (1)

Contact: tullio.tolio@polimi.it

STC P

Gear metrology - An update - G. Goch (1) - Contact: fgoch@uncc.edu

STC S

Modelling and simulation of surface generation in manufacturing - G. Tosello (2)

Contact: guto@mek.dtu.dk

2024 Keynote Papers proposals

STC E

Dynamic Beam shaping in Laser Processes - M. Schmidt (2)

Contact: michael.schmidt@lpt.uni-erlangen.de

STC F

Artificial Intelligence in metal forming (data integration and sensors in metal forming)

J. Cao (1), M. Merklein (1) - Contacts: jcao@northwestern.edu; marion.merklein@fau.de

STC G

Advances in modelling of abrasive processes - A. Shih (1) - Contact: shiha@umich.edu

STC M

Hybrid Additive/Subtractive Machines - S. Smith (1) - Contact: smithss@ornl.gov

STC P

Integrated metrology for advanced manufacturing systems - A. Archenti (2)

Contact: archenti@kth.se

STC S

Surface conditioning in machining processes - V. Schulze (2)

Contact: volker.schulze@kit.edu

2025 Keynote Papers proposal

STC P

Dimensional metrology based on ultrashort pulse laser and optical frequency comb

W. Gao (1) - Contact: gaowei@cc.mech.tohoku.ac.jp

2026 Keynote Papers proposal

STC P

Machine learning in production metrology - G. Lanza (1)

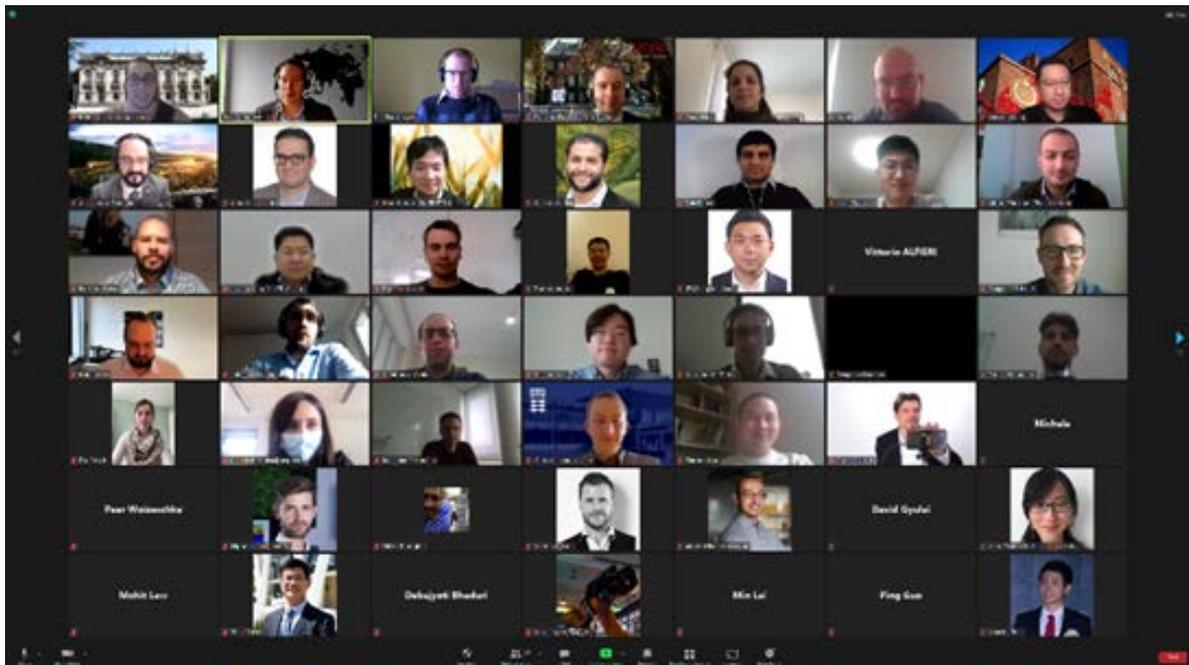
Contact: gisela.lanza@kit.edu

News from the Research Affiliates

Words from the RA Steering Committee,

Dear Research Affiliates and CIRP Colleagues,

We are now already a year in a nearly complete online working environment. It is good to see that even in these circumstances many of the CIRP initiatives can still continue, even though the form is different. Collaboration is one of the main goals of the Research Affiliates, and that is something we still manage to do with all the online facilities we have.



The experience many of the RA's already have in online meetings, e.g. due to the CIRPe conferences, is highly appreciated by CIRP. Many RA's supported in the organisation of the 2020 General Assembly and the 2021 Winter Meeting.

During the online winter meeting, we had a pleasant meeting with some good discussions on the activities of the RA's, and we would like to mention again that every RA is invited to provide a new topic for one of the working groups. We also had a nice presentation and starting point for the teaching activities of RA's by Alessandro Simeone, and this topic will be further elaborated the upcoming time. Furthermore, we also kindly ask for candidates for the secretary role in our Steering Committee.

Further upcoming events this year are the next RA workshop that will be organized by Alborz Shokrani Chaharsooghi (University of Bath, (UK)), and the CIRPe2021 Global Web Conference organized by Khaled Medini (École des Mines de Saint-Étienne (FR)).

We hope to meet you all at our next online meetings and upcoming CIRP events. We hope you will enjoy your RA experience and the collaboration within the CIRP community.

The RA-board - Roy Damgrave, Vincent Wang and Pinar Bilge

8th CIRPe Global Web Conference 2020

The 8th CIRP Global Web Conference “CIRPe 2020” (www.cirpe2020.com) was held virtually on October 14-16, 2020 and hosted by the Department of Mechanical Engineering, KU Leuven, Belgium. The conference chairs were Karel Kellens, Eleonora Ferraris and Eric Demeester.

The central theme of the conference was “Flexible Mass Customisation”. This broadly defined theme allowed the organizing committee to accept 61 papers for presentation, after double review process, out of 102 submitted abstracts. Contributions came from 18 countries over 4 continents. 18 sessions were organized on 11 themes. 212 unique participants took place to the conference with 15 to 25 attendees per sessions and 2 to 4 questions per presentation (more interaction occurred through the chat box). Copies of the proceedings are available open access at Procedia CIRP and the recorded paper presentations are available via YouTube.

The conference co-chairs would like to thank both scientific CIRP sponsors Prof. Jean-Pierre Kruth (KU Leuven, Belgium) and Prof. Roberto Teti (University of Naples, Italy) as well as all members of the International Scientific Committee and Local Organising Committee.

9th CIRPe Global Web Conference 2021

The 2021 edition of the CIRP Global Web Conference is organized by Mines Saint-Etienne and West Virginia University. The conference will be held virtually from October 26 to 28, 2021. The conference organizing committee chairs are Assoc. Prof. Khaled Medini, from Mines Saint-Etienne, LIMOS, France and Prof. Thorsten Wuest, West Virginia University, USA. Scientific sponsors of CIRPe 2021 are Prof. Alain Bernard from Centrale Nantes, France, Prof. Stephen Lu from University of Southern California, USA.

CIRPe aims to involve scientists, researchers, and engineers from all over the world to promote dissemination and discussion on the latest achievements in production engineering. The general theme of the conference this year, is “Sustainable, resilient, and agile manufacturing and service operations: Lessons from COVID-19”. The conference is open for contributions in the broad area of production engineering, papers from all CIRP STCs are welcome and encouraged!

The official call for paper will be launched soon. However, potential contributors may start preparing abstracts for submission by the end of this month (March 2021)!

12th CIRP RA Workshop 2020

Due to the worldwide pandemic, the 12th CIRP RA Workshop was organised for the first time online as an e-Workshop on July 6-7, 2020 (<http://cosmer.univ-tln.fr/en/12th-cirp-ra-workshop/>). The organiser was Ass. Prof. Sébastien Campocasso. Several presentations done by the host team from the University of Toulon, and five external guests, allowed varied scientific, technical and industrial discussions.

Twelve Research Affiliates from five countries (France, Germany, Italy, South Korea and UK) participated to this event. This number is in the same range as previous ‘physical’ workshops and allowed also friendly exchanges during this difficult period.



13th CIRP RA Workshop 2021

The 2021 CIRP Research Affiliate Workshop will be held online on Friday 25th June 2021 organised by the University of Bath, Bath, United Kingdom. The workshop will be organised by Dr. Alborz Shokrani and Dr. Eviropides Loukaides and will focus on Intelligent Sustainable Manufacturing.

The workshop will be an opportunity to network for CIRP Research Affiliates and will include keynote presentations by industry leaders, an update on funding opportunities and a panel discussion for research collaboration and publication.

Bath is located in the South West of England which is an aerospace manufacturing hub of the UK with major aerospace companies such as Airbus, Rolls Royce, GKN Aerospace, Leonardo, etc. nearby. University of Bath is a leading UK University in manufacturing technology.



New book from RA's

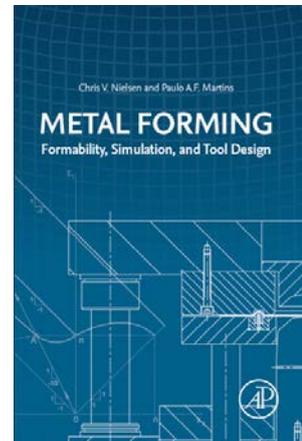
Metal Forming: Formability, Simulation, and Tool Design

Authors: Chris Nielsen and Paulo Martins

The recently published book 'Metal Forming: Formability, Simulation, and Tool Design' (17th February 2021, Academic Press) provides readers with an integrated overview of the theory, experimentation and practice of metal forming.

Metal formability includes plastic instability, necking, and the role of stress triaxiality and shear. In addition, uncoupled ductile damage criteria are introduced. Finite element topics cover the method itself, the flow formulation, an introduction to a solid formulation, and also the accuracy, the reliability and the validity of finite element models from a user perspective. Tools examples and design guidelines for cold, warm and hot forming processes are provided, as well as considerations on their materials, lubrication and failure.

By including applications, worked examples and detailed techniques, this book is intended for academic researchers and engineers in mechanics, material, manufacturing and metal forming, but also students with an advanced level in metal forming.



Awards, prizes

Dr. Marc-André Dittrich accepted the Otto-Kienzle Commemorative Medal – the prestigious award of the WGP, the German Scientific Society for Production Engineering. Every year, the WGP awards the Otto-Kienzle Commemorative Medal to an excellent junior scientist of manufacturing technology. At this, not only special performance in the scientific area is honoured but also the award winner's personality. Because of the COVID19-pandemic, the award ceremony took place in February 2021 under special circumstances.



Award ceremony: from left: P. Nyhuis, B. Denkena, B.-A. Behrens, M.-A. Dittrich

Our CIRP Conferences

52nd CIRP Conference on Manufacturing Systems (12 – 14 June 2019, Ljubljana, Slovenia)

Conference organizer: P. Butala

The 52nd CIRP Conference on Manufacturing Systems was held from 12-14 June 2019 in Ljubljana, Slovenia. The scope of the conference was to review and discuss the advances, research results, and industrial improvements in the field of manufacturing systems, which are facing significant and radical societal and technical changes. The conference's objective was to provide an international forum of researchers 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 manufacturing systems.

The conference featured four keynote presentations from:

- Prof. Mitchell M. Tseng on The emerging value transformation in the next generation manufacturing systems;
- Prof. Gideon N. Levy on Additive manufacturing – multi process, multi materials, multi applications – a demanding manufacturing ECOsystem;
- Prof. Goran D. Putnik on Networked production and organizations: A driver and enabler for future societies in the 21st century, and
- Dr. Damir Husejnagić with an industrial keynote on Collaboration between industry and university: Building an advanced Industry 4.0 case.



Opening Ceremony and keynote presentations

Eight parallel scientific sessions were held over three days, with 80 sessions in total, addressing issues from topics related to the design, modelling, simulation, planning, managing, control, operation, reconfiguration, adaptation, networking, and other relevant matters of manufacturing systems and their building blocks, while expanding future perspectives. In alignment with the conference title, 'Manufacturing Systems for the Future Societies', special attention was given to the social dimension of modern manufacturing systems. This included, but was not limited to, the role of humans in cyber-physical systems, the potentials of social technologies and networking, the opportunities of 'crowd-based' business models, the issues

of openness and collaboration, and, last but not least, the questions of social sustainability of manufacturing systems for developing societies and for the 'base of the pyramid' communities.

246 presentation were given by the participants, most of them addressing the technological developments propelled by the 4th industrial revolution, digitalization and cybernation of the processes, and the implementation of advanced technologies in cyber-physical production systems, as well as corresponding social dimensions and challenges.

The highlight of the social part of the conference was the gala dinner, held at the beautiful Postojna cave. After a tour of the cave with a unique in-cave a capella concert, the gala dinner was hosted at the nearby historic mansion.



The tour of the Postojna cave and the a capella concert performance



Gala dinner and feature members of the CIRP community

The 52nd CIRP Conference on Manufacturing Systems was hugely successful, providing the CIRP community with a venue to reflect on current and future issues in the area of manufacturing systems, as well as introducing numerous young scientists to the community.

2nd CIRP Conference on Composite Material Parts Manufacturing (10 – 11 October 2019, Rotherham, UK)

Conference organizer: K. Kerrigan

The 2nd CIRP Conference on Composite Material Parts Manufacturing took place at the Advanced Manufacturing Research Centre (AMRC), from 10th to 11th October 2019. The AMRC is a network of world-leading research and innovation centres working with manufacturing companies from micro-SMEs to multi-national giants around the globe. Within this network, the AMRC's Composite Centre aims to utilise innovative manufacturing methods to produce ultra-lightweight components from composite materials.

This conference offered a tremendous opportunity for experts spanning from academia to industry in the field of composite material parts manufacturing to present and discuss their findings on a very high level, stimulating, supporting and expanding the knowledge in this field. The aim of the conference was to bring together and share novel production research, technologies and solutions to the global composite manufacturing community.

There was some rich technical discussion, particularly in the area of cutting of CFRP, which was a particular highlight of this event. The conference also celebrated the Sheffield region's rich industrial heritage with guided after-dinner tours of the famous Cutler's Hall – the home of the Master Cutler.

Through the delivery of 59 presentations of various composite manufacturing-related research works, in topics of Design and Life cycle, Part generation, Cutting, Hybrid part manufacturing and NDT, along with technical demonstrations of technologies spanning dry fibre, automation, advanced curing and machining, to 99 attendees from 4 different continents, it was agreed at the end of the conference that this aim was successfully achieved on an international scale.





16th CIRP Conference on Computer Aided Tolerancing (15 – 17 June 2020, Charlotte, North Carolina, USA)

Conference organizer: E. Morse

The 16th CIRP Conference on Computer-Aided Tolerancing was scheduled for June 15-17, 2020 to be held in Charlotte, North Carolina, USA. The worldwide pandemic associated with the novel coronavirus changed the planning initially to accommodate a partially-online conference, and then to a fully online conference. The dates of the conference remained unchanged, and the scheduling of the paper presentations was adapted in the following ways:

- The hours of the conference were changed to 1000-1600 UTC each day, to accommodate the attendees from around the world;
- There was a single track of presentations so that all attendees could hear all presentations;
- The presentations were limited to approximately 5 minute pre-recorded videos, so that adequate time for questions and answers was permitted;
- During the breaks between sessions for the second and third days of the conference, all attendees were given 'panelist' privileges which allowed them to communicate directly with other individuals in the conference. This adaption was popular with the attendees.

The theme of the conference was "Opportunities and Constraints in the Standardization of Geometrical Product Specifications" and this theme was supported by having two keynote presentations on the first day. The speakers, Paul Drake and Iain Macleod, are the chairmen of the ASME Y14.5 committee and the ISO/TC 213 committee respectively. Their presentations intentionally had similar structure: giving the history of the committee, describing some of the current challenges at present, and describing a desired course forward as the demands for product specifications continues to evolve. The titles of the keynote presentations were:

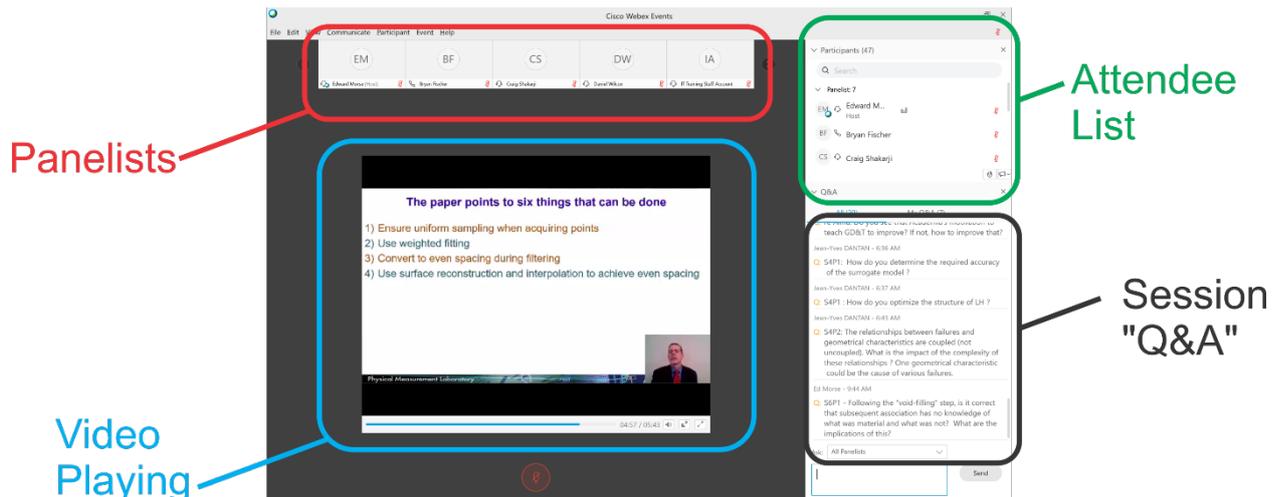
- Geometric Dimensioning and Tolerancing – the work of ASME Y14.5, by Paul Drake
- Geometrical Product Specification – the work of ISO/TC213, by Iain Macleod

In the discussions that followed the keynotes, there was much interest in the harmonization efforts between the two organizations, and the prospects for more common meanings for the shared symbols used by the ASME and ISO communities. In addition, Iain Macleod explicitly noted the role that the CIRP CAT community has had in the past – and still has – in influencing the development of ISO standards. This role includes the introduction of concepts (invariance classes, the duality principle) that eventually appear in standards, and the careful analysis of the influence of algorithmic suggestions (constrained L2-norm) that are candidates for standardization.

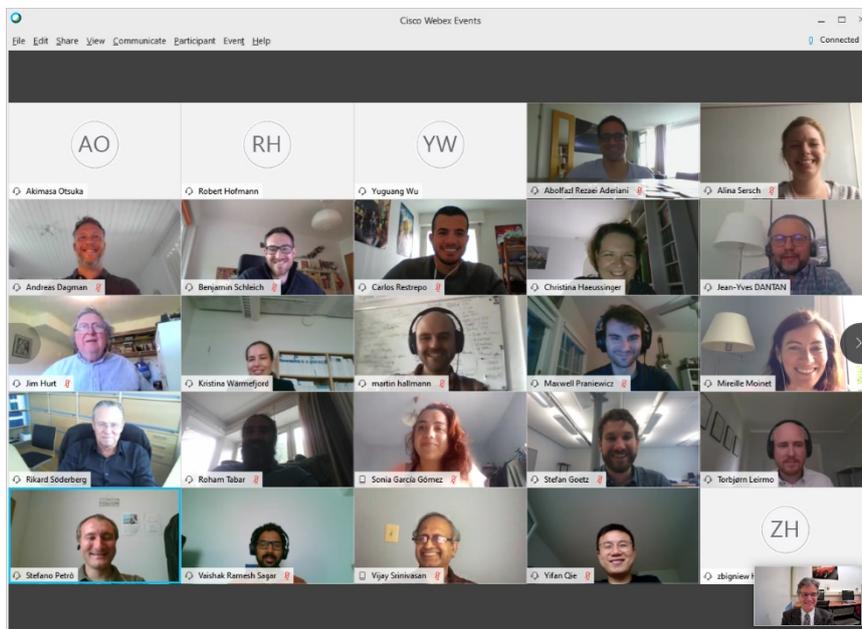
After the "live" keynote presentations, the paper sessions began. Each session consisted of 4-5 recorded presentations of approximately 5 minutes in length. The authors were asked to think of this as an "advertisement" for the paper that covered the high points of the research. This would remind the audience of the paper's content, and encourage those who had not yet read the paper to do so. The authors all did a very nice job with these instructions, and followed the timing guidance very well: the average presentation length was 5 minutes, 6 seconds and over 60% of the presentations were within 30 seconds of the 5 minute target. In the first paper session, the questions were a bit slow to arrive as the attendees became familiar with the WebEx interface. In the paper sessions that followed, there were numerous questions before the videos finished playing.

One important aspect of conferences is the social interaction and networking that can occur between sessions. Unfortunately this was not easily accomplished in the online setting. After the first day, the process of breaks between sessions was adjusted so that all attendees could communicate one-on-one with other attendees. This was a positive change, and the organizers received good feedback regarding this aspect of the meeting. An improvement for future online conferences would be to have the ability for attendees to self-select small groups in which they could share audio and video, similar to the small groups that form at conferences.

While there are no photographs from the conference, the screen captures below show the interface as seen from the organizer's side, and part of the "group photo" taken at the close of the conference.



View from the host screen managing the conference.



Part of the conference "group photo"

53rd CIRP conference on Manufacturing Systems (1-3 July 2020, Chicago, USA - Hosted Virtually)

Conference organizers: J. Cao, R. Gao

Responding to restrictions posed by the coronavirus pandemic, the 53rd CIRP Conference on Manufacturing Systems (CMS 2020) Organizing Committee embraced the considerable challenges and organized an event that offered the 270+ registered participants an opportunity to virtually connect with each other to disseminate their research work, seek collaborations, and engage in discussions to further advance manufacturing. With enthusiastic support by authors from 31 countries, CMS 2020 provided a technological as well as social platform for an information exchange with diverse international perspectives.

The event began on July 1st with an Opening Ceremony that preceded the first Plenary Session. Professor Mamoru Mitsuishi, President of CIRP, gave a live opening speech through video link. His welcoming remarks on the importance of manufacturing engineering fused with IT and AI during the “post-corona” era and strong support to researchers being connected, excited the conference attendees of this first-ever virtual CMS conference.

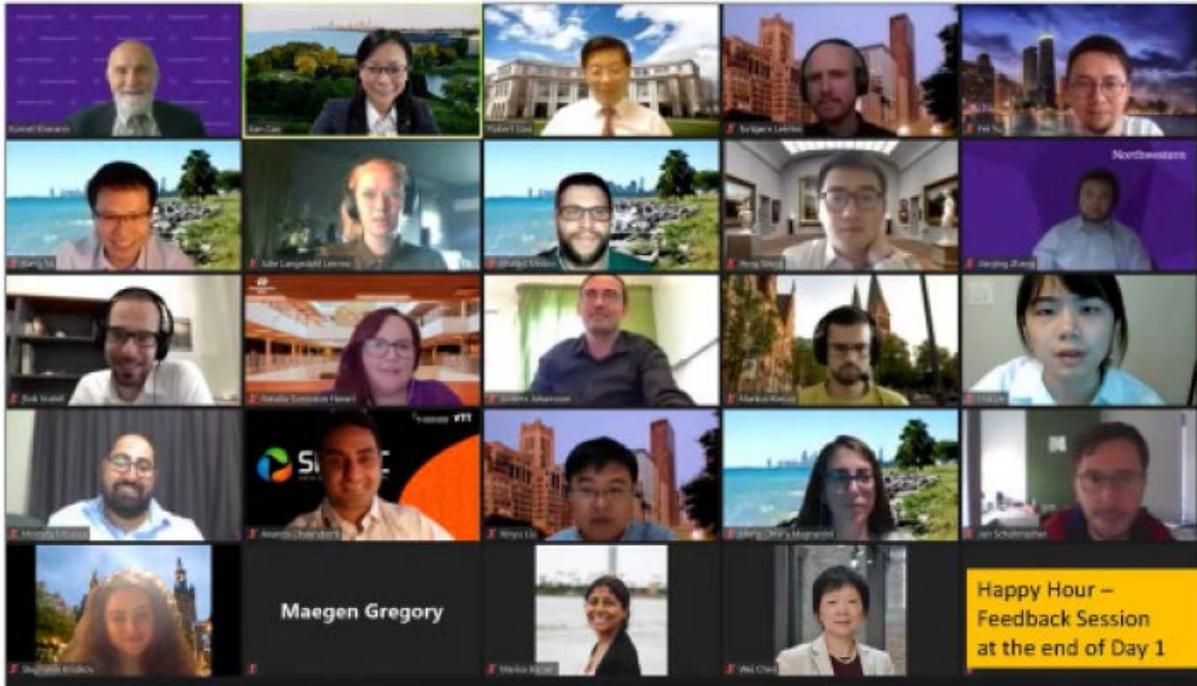
A highlight of CMS 2020 were the two Plenary Speeches given by distinguished colleagues, Professor Hoda ElMaraghy of the University of Windsor, Canada, on Day 1, and Professor Wei Chen of Northwestern University, USA, on Day 2. Their respective presentations on the *Next Generation of Manufacturing Systems*, particularly at the intersection of distributed/localized and global manufacturing, and *Data-Driven Computational Design of Engineered Material Systems* for two distinguished cases, i.e., big data and small data scenarios, attracted a large number of attendees during the two days.



CIRP CMS 2020: Top-row: Prof. Kornel Ehmann (Co-chair, Northwestern University), Prof. Jian Cao (Co-Chair, Northwestern University), and Prof. Robert Gao (Co-chair, Case Western Reserve University);

Bottom-row: Prof. Hoda ElMaraghy (Plenary Speaker, University of Windsor), Prof. Mamoru Mitsuishi, President CIRP, and Prof. Wei Chen (Plenary Speaker, Northwestern University)

Another feature that was welcomed by the conference attendees was the virtual Happy Hour at the end of Day 1, which provided an opportunity for networking and feedback solicitation. Feedback received helped the organizers make several adjustments for Days 2 and 3, e.g., engaging the authors more actively by providing live feedback during the Q&A session after each Author Presentation.



CIRP CMS 2020: Happy Hour Day 1

The final Conference Event was the Closing Ceremony, which included the Awards Presentation and Closing Remarks, Attended by 144 attendees. Two types of Awards were conferred for CMS 2020. The first was the Best Paper Award, which was shared by two papers based on the rating from the Award Selection Committee. The two papers are titled: (1) *Efficient Dynamic Machine Tool Simulation with Included Damping and Linearized Friction Effect* and (2) *Attention Mechanism-Incorporated Deep Learning for AM Part Quality Prediction*, with authors from Germany, Switzerland, and the USA, respectively. The second type of award was the Best Associate Editor Award. Created for the first time in CIRP CMS history, this award recognizes outstanding effort by an Associate Editor who has handled the paper review process rigorously and expeditiously. Based on the evaluation from the co-chairs of the editorial committee, two recipients were chosen to share this award: Prof. Tony Schmitz from the University of Tennessee, and Prof. Ray Zhong from the University of Hong Kong.

The technical portion of CMS 2020 included recorded pre-event author presentations, each 20 minutes long and viewable online, that supported the live event programming, which took place for 4 hours, each day during July 1-3. Participants were encouraged to view the 20-minute author presentations before the event, which allowed the live event to include more concise summaries of the work with Q&A. This arrangement proved to allow a more streamlined and efficient flow of materials for the benefit of all attendees.

This live event programming (i.e. Technical Program) included 260 Presentations over the 3-day event. Each presenting author was invited to give a 5-minute presentation on the work, to supplement the previously recorded 20-minute video and prepare the audience for a 5-minute interactive Q&A, moderated by the respective Session Chair. Feedback from the session attendees indicate that this format of the live event gave authors enough time to summarize their technical work without over-extending and leaving the Sessions heavy, while providing the audience with the right amount of content to keep them engaged. According to the post-conference survey, 77% of the attendees reported that they viewed author presentation videos before the event, and 36% of which viewed more than 5 videos before the event. Furthermore, 77% of the attendees reported that they planned to continually view the videos during the 14-day post-conference period, when the videos remained available on the conference website.

11th CIRP Conference on Photonic Technologies [LANE 2020], (07-10 September 2020, virtual conference)

Conference organizer: M. Schmidt

This year things are totally different. Due to Covid-19, there are several problems and questions to be asked in all industries. We also have been challenged by this situation and had to decide if and how LANE could take place this year. Despite all difficulties we accepted the challenge and did our best to convert the conference to a virtual format - with great success: 420 participants from 28 countries joined our first virtual LANE from September 07 to 10, 2020. Furthermore, the positive feedback we got from the conference attendees made us happy.

More than just a video call

For the realization of virtual LANE, we created a conference platform with which presentations could be streamed live, but also the exchange among each other was possible. Virtual LANE was more than just attending a video call or viewing a live stream. Participants had the chance to listen to 213 live talks, to stream pre-recorded video presentations, to inform about newest system technology at the sponsor booths, to have an intense exchange by live discussions, chat function and different matchmaking tools, and not at least to have some fun at our conference warming.

The comprehensive and diversified conference program covered the following topics: Additive Manufacturing; E-Mobility/Batteries; Fast beam manipulation & beam shaping; Laser assisted processes; Laser beam welding metals/polymers, brazing & soldering; Laser beam cutting & drilling; Laser safety; Precision processing with ultrashort laser pulses; Simulation & modelling; Sensing & control; Surface treatment & forming.

As in previous LANE conferences, our “Country Special” got a lot of attention. This year six experts from science and industry introduced the laser technology community of Lithuania.

Top-class keynote speakers

Even this year the exciting keynote talks could not be missed. Three top-class scientists gave an insight into their research work:

- M.Sc. Antoni Artinov, Bundesanstalt für Materialforschung und -prüfung (BAM), Division 9.3 Welding Technology, Germany: On the relationship between the bulge effect and the hot cracking formation during deep penetration laser beam welding.
- Prof. Alexander Jesacher, Medical University of Innsbruck, Assoc. Prof. Division of Biomedical Physics, Austria: Dynamic Beam Shaping: Basics and possibilities.
- Prof. Leonid Zhigilei, University of Virginia, Professor of Materials Science and Engineering, USA: Atomistic and multiscale modeling of laser-induced surface modification and generation of nanoparticles.

Awards and winners

Not only the presentations highlighted the conference, also the different awards caused excitement.

The ceremony for the Award of the German Scientific Laser Society (WLT) took place during the plenary session. Prof. Frank Vollertsen announced Christian Hagenlocher from the University of Stuttgart as the winner of the "WLT Award" for his work on "The Influence of Residual Stress on Laser Beam Welding Processes of Aluminum Alloys".

Once again, a prize for the best presentation was awarded. All participants were allowed to vote for their favorite live or video presentation. The winner of this year's "Best Presentation Award" is Troy Allen from Queen`s University, Kingston, Canada, for his talk on "Simultaneous in operando monitoring of keyhole depth and absorptance in laser processing of AISI 316 stainless steel at 200 kHz".

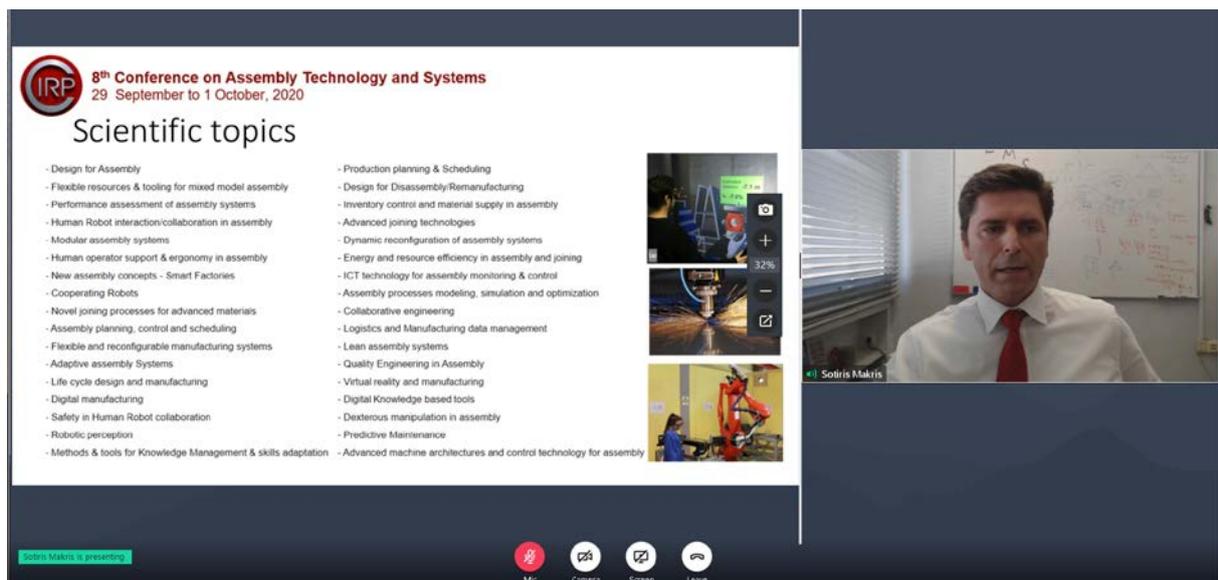
Virtual Conference Warming

As no classical evening event was possible this year, we organized a virtual "Conference Warming" on the first evening of the conference, which was sponsored by Sill Optics. Already in the run-up, all participants had received a ceramic mug, tonic water and other presents. So, all attendees could join the virtual lounges, mix their own drinks and raise their mugs during the Conference Warming. Fun and also a little piece of adventure was provided by virtual Exit Games, where the players had to solve missions in teams, a photonic quiz, a picture puzzle and in the final game stage a Rock-Paper-Scissors battle. The winner of the games course received a self-assembly drone kit.

8th CIRP Conference on Assembly Technologies and Systems – CATS 2020 (29 September – 01 October 2020, Athens, Greece)

Conference organizer: **S. Makris**

The 8th CIRP Conference on Assembly Technologies and Systems - CATS 2020 with the special theme on “Digitalising smart factories” offered the opportunity to discuss the latest advances in Digital technologies for smart manufacturing. The conference initially planned to take place in Athens-Greece, took place online due to the recent COVID-19 pandemic.



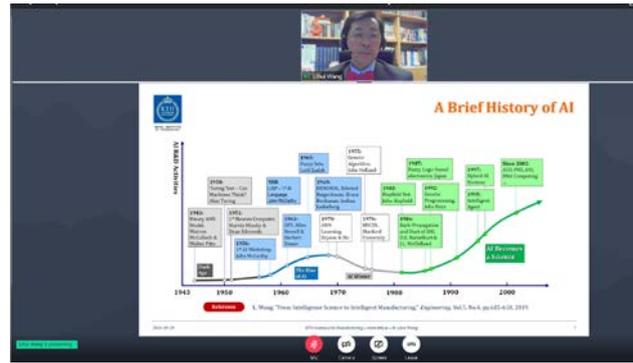
S. Makris opens the CIRP CATS 2020, Plenary session

Four keynote papers and ninety regular papers have been accommodated in the 3,5 hour daily schedule for all 3 days of the conference. The keynote papers, 2 coming from academia and 2 from the industry were presented at the beginning of each day to spark the interest of participants by providing insight to both technological developments and industrial challenges:

- "AI and Brain Robotics for Human-Robot Collaboration", Lihui Wang, Kungliga Tekniska Högskola.
- "Seamless human-robot interaction", Sotiris Makris, Lab. for Manufacturing Systems and Automation (LMS), University of Patras.
- "Advanced soft robotics technologies and smart mechatronics", Alfio Minissale, COMAU S.p.A.
- "Safety and security in collaborative workspaces", Toni Guasch, Pilz Industrieelektronik S.L.



Keynote presentation – S. Makris



Keynote presentation – L. Wang

To facilitate access of the participants to all presented papers, a hybrid offline/online approach was selected by the Organizing Committee:

1. Extended recordings of the paper presentations were made available on the conference website allowing the offline viewing by participants. The attendees had the chance to watch the presentation offline either before or after the live presentation, allowing them to come up with questions or re -visit the presentation later for in depth reflection on the presented concepts.

Session 3: "Digital Technologies for Flexible Assembly - DTFA1"

[Click to join the live session](#)

Paper 3.1 **Identification of digitalization trends and use cases in assembly**
Susanne Vernim, Moritz Krauel, Gunther Reinhart

Abstract:Digitization and Industrie 4.0 are two of the most common keywords in research and industry in the last few years, which changed production systems significantly. These changes not only affect the used technologies but also the work organization and competences of the production workers. To determine the effects on the qualification profiles of workers, the relevant digitization trends in manual assembly must be identified. This article presents the results of a quantitative literature review, in which the authors identified and rated the most common digitization trends and how their mentioning in assembly related scientific literature developed over the last years. More than 300 publications were examined concerning their relevance for assembly workers. In this process, 13 typical trends, so-called enablers, and 7 use cases were distinguished, which have a major impact on manual assembly.

Recorded presentations were made available on the conference website

2. Throughout the three days of the conference the attendees initially attended the Opening session and Keynote presentations which were followed by 4 parallel sessions. In each session every paper was presented through the online conferencing platform and time for Q&As or interaction with the presenter was allowed at the end of each presentation.



G. Michalos moderating the Opening Session



CATS 2020 Closing session

Ninety (90) papers were presented in the actual scientific program organised in 20 sessions, covering the following scientific research topics: Advances in Handling Systems, Mechanical and Digital aspects, Machine learning and AI, Robots modelling, accuracy, impedance control, AR/VR, Augmented intelligence, Human robot interaction, Models for predicting the behaviour of bolted composites, Assembly for Miniaturised Components, CPS systems, measurement systems, vision systems, Smart assembly systems, Computer assisted ergonomics, Assembly systems for electromobility, Cognitive technologies in assembly, Operator support in Human-Robot collaborative and AI, Simulating and Handling of wiring harnesses, Defects prediction in assembly. The website (<http://cirp-cats2020.com/>) hosts the actual papers and video presentations.

During the closing session of the conference an invitation to CIRP CATS 2022 to be organized by KU Leuven was extended to all participants by Prof. Karel Kellens.

Deep appreciation is due to the people and organisations that contributed to the realisation and success of CIRP CATS 2020. Special thanks is extended to the Honorary Chair, Prof. G. Chryssolouris and Co Chairs, Prof. D. Mourtzis, Prof. P. Stavropoulos and Dr. Kosmas Alexopoulos. Prof Lihui Wang and Prof. József Váncza have also contributed as reporting CIRP Fellows

Especially to the following people taking care of the conference sessions planning, technical support, editorial support, registrations process, web site setup: Dr. Michalos G., Mr. Karagiannis P., Ms. Arkouli Z. Mr. Mparis K., Mr Aivaliotis P., Dr. Papacharalampopoulos A., Ms. Kousi N., Mr. Nikolakis N., Ms. Zoga M., Mr. Andronas D., Mr. Toggias T., Mr. Gkournelos C., Mr. Papavasileiou A.

8th CIRP Global Web Conference – CIRPe 2020 October 14-16, 2020

Conference organizers: K. Kellens, E. Ferraris

The 8th CIRP Global Web Conference “CIRPe 2020” was held virtually from October 14-16, 2020 and hosted by the Department of Mechanical Engineering, KU Leuven, Belgium.

The annual CIRPe web conference series is an initiative of the CIRP Research Affiliates (RA) and aims to involve scientists, researchers, and engineers from all over the world to promote discussion on the latest achievements in production engineering. The CIRPe has grown and matured from a workshop-style networking event to a full-size online conference with growing reputation. It disseminates scientific contributions to a wide range network of academic and industrial partners. This conference offers a forum for scientific discussions and knowledge sharing by being individual accessible and broadcasted around the world through an internet-based platform.

The central theme of the 8th CIRPe Global Web Conference 2020 was “Flexible Mass Customisation”. A broadly defined theme in order to cover domain-spanning and diverse topics in the field of Production Engineering. As a result, the CIRPe 2020 organising committee has, after the peer-review process, accepted 61 papers for presentation out of 102 submitted abstracts. The authors represent research institutes and companies from 18 countries and 4 continents. Thank you to all authors, presenters and conference attendees for their valuable and interesting contributions.

The screenshot shows a Zoom meeting interface. The main slide is titled "Participants" and features the CIRPe 2020 logo, the text "8th CIRP Global Web Conference Flexible Mass Customisation", and the dates "October 14-16, 2020". Below the title, it states "102 Abstracts" with a downward arrow pointing to "61 Papers & Presentations" and "Authors from 18 countries". A world map highlights 18 countries in red. Below the map are 18 national flags. At the bottom of the slide, it says "CIRP office: 9 rue Mayran, 75009 PARIS – France, E-mail: cirp@cirp.net, <http://www.cirp.net>". The right side of the screen shows a "Participants" list with names and icons, including Jeroen Cramer, Ahmet Yuksekerk (Guest), Akash (Guest), Barton, David (WIK), Benedikt Schmeucker, Carsten Schande, colinreiff, David De Schepper, Eike Schaffer (FAU) (Guest), Eleonora Ferraris (Guest), Eric Demeester, Henning Buhl (Guest), Janine-Tajana Mauer (Guest), Karel Kellens (Organizer), Lars Roggarts (Guest), and Li Yi (Guest). The bottom of the screen shows a grid of video thumbnails for various participants.

The papers are presented in 11 technical tracks and organised in 18 parallel sessions: Production Planning and Organisation, Process Optimisation, Manufacturing, Additive Manufacturing, Design, Life Cycle Engineering, Industry 4.0, Robotics, (Reverse) Logistics, Operator Assistance, and Process Monitoring and CT. All presentations have been recorded and will be made available online.

The conference co-chairs would like to thank both scientific CIRP sponsors Prof. Jean-Pierre Kruth (KU Leuven, Belgium) and Prof. Roberto Teti (University of Napels, Italy) as well as all members of the International Scientific Committee and Local Organising Committee. Their support was a key to the success of the CIRPe 2020 conference.

The screenshot displays a Microsoft Teams meeting interface. The main area shows a grid of video thumbnails for participants. The left sidebar contains navigation icons for Activity, Chat, Teams, Assignments, Calls, Files, and Help. The right sidebar shows the 'People' list, which includes participants currently in the meeting and those invited from the conversation.

Participants in the meeting:

- Eric Demeester
- Guineé Nuyssé
- Ahmad Sadek
- Karel Kellers
- Jean-Pierre Kuhl (Guest)
- Lyiane (Guest)
- Benedikt Schmucker
- Bickel, Sebastian

People List (Currently in this meeting: 29):

- MC Martijn Cramer
- AS Ahmad Sadek (Outside your organization)
- AY AHMET YUKSELTURK (Outside your organization)
- A Akash (Guest)
- A Ali (Guest)
- DB Barton, David (WBK) (Outside your organization)
- BS Benedikt Schmucker (Outside your organization)
- SB Bickel, Sebastian (Outside your organization)
- CS Carina Siedler (Guest)
- C Clausmeyer (Guest)
- EF Eleonora Ferraris (Guest)
- ED Eric Demeester

Invite others from conversation (34):

20th CIRP conference on Electro Physical and Chemical Machining

(19 - 21 January 2021, on-line)

Conference organizer: K. Wegener

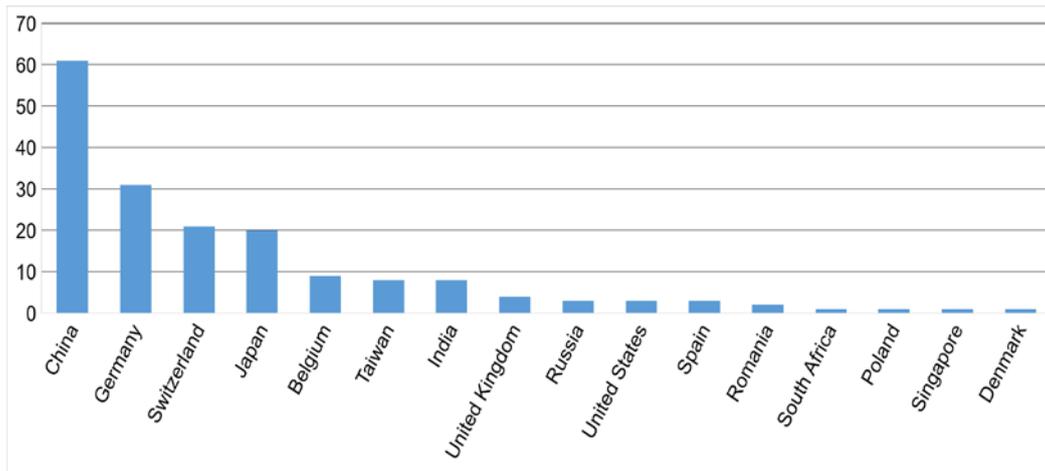
The 20th CIRP conference on Electro Physical and Chemical Machining, ISEM XX was organized as a full online conference in January 19 to 21 2021 after having been planned for June 2020, then as a presence conference later as a hybrid conference in January 2021. All attempts to keep the presence form of this conference for the exchange of ideas between academia and industry were in vain.

The chosen format of the conference was based on uploaded presentations of all authors, which could be visited at any time by participants. But to promote discussions the conference had 25 Q&A-sessions in one sequence, so that for each paper the author could summarize in a minute the essential results followed by a 5 to 8 minutes long discussion. This format allowed for the first time to really follow all presentations of the conference. The chairmen for the sessions were extremely well prepared and knowledgeable about the max. 8 presentations per session, to start asking questions and thus encouraging also the listeners to take part in the discussion. By this a lively exchange of ideas was achieved. Since there was only one continuous session, the attendance was consistently high.

From the 258 papers received 179 were accepted and grouped into following sessions:

- 3 sessions on Additive manufacturing
- 1 session on electron beam machining and special technologies
- 4 sessions on electrochemical machining including micro machining
- 8 sessions on EDM including EDM drilling and milling, simulations and fundamental research
- 3 sessions dedicated to wire EDM
- 3 sessions on laser ablation technology
- 2 sessions on plasma machining and specialized technologies

The following picture shows the distribution of papers per country. While China contributes the largest amount of presentations, Germany and Switzerland had some homefield advantages over the next strong contributor Japan.



Number of papers per country

An introductory speech from the session chair Konrad Wegener and the CEO of the Swiss industrial association of machine building electrical and metal working industries, Stefan Brupbacher made the opening after a folkloristic performance of the Alpen Horn Blower Consortium «City of Zurich».

Switzerland and ETH Zurich and Lausanne

ETHZ (1855)



Gottfried Semper designed ETH main building.

ETHZ Hönggerberg



ETH Zürich founded 1855

ETHZ Today (2019):

- Total students: 22200
- Bachelor students: 9900
- Master students: 7000
- PhD students: 4200
- Staff: 9800
- Professors: 541

EPFL Today (2019):

- Total students: 11100
- Staff: 5713
- Professors: 319

EPF Lausanne



ETH zürich IWF Institute of Machine Tools and Manufacturing inspire

27

Opening: Konrad Wegener



Opening: Stefan Brupbacher



Alpen Horn Blower Consortium

Six keynote presentations gave an overview on different topics mainly covering the scope of the conference:

Hybrid Manufacturing based on the combination of Mechanical and Electro Physical-Chemical Processes, B. Lauwers (KU Leuven)

IRP ISEM 2020
20th CIRP Conference on Electro Physical and Chemical Machining
19th – 21st January 2021, Zurich, Switzerland

JUVEN FLANDERS MAKE

Keynote Presentation

Hybrid Manufacturing based on the combination of Mechanical and Electro Physical-Chemical Processes

B. Lauwers, N. Chernovol, B. Peeters, D. Van Camp, T. Van Riel, J. Qian

Department of Mechanical Engineering
Division Manufacturing Processes & Systems - Flanders Make@KULeuven-MaPS
bert.lauwers@kuleuven.be

Advanced Manufacturing for
Advanced Ceramics, A.
Michaelis (IKTS Fraunhofer)

Advanced Manufacturing for technical ceramics
Fraunhofer Institute of Ceramic Technologies and Systems, Dresden
Prof. Dr. Alexander Michaelis

Annual Budget: 76 M
Staff: 750

Structural ceramics Non destructive testing: NDT Functional ceramics
Digitalization

Materials Materials Diagnostics Life science Energy systems

Additive Manufacturing

Components Environmental Engineering Electronics / Smart Microsystems Industry 4.0
Membrane Technology

Fraunhofer

Digital Twin Concept for EDM
and ECM Processes, A. Klink
(RWTH Aachen)

Digital Twin Concept for EDM and ECM Processes
ISEM 2020 - 20th CIRP Conference on Electro Physical and Chemical Machining (online 2021)

Dr.-Ing. Andreas Klink
Wednesday, January 20th, 2021

ISEM 2020 ISEM XX

Laser Cladding – the latest
developments in technology.
Overview from the industry, A.
Zikin (Oerlikon Metco AG)

Laser Cladding Technology
Trends, Materials and Application examples

Dr. Arkadi Zikin - Head of Laser Centre of Competence by Oerlikon
20.01.2021 Zürich

ISEM XX ISEM 2020

The emerging role of imaging in
laser materials processing, M.
Schmidt (FAU Erlangen)

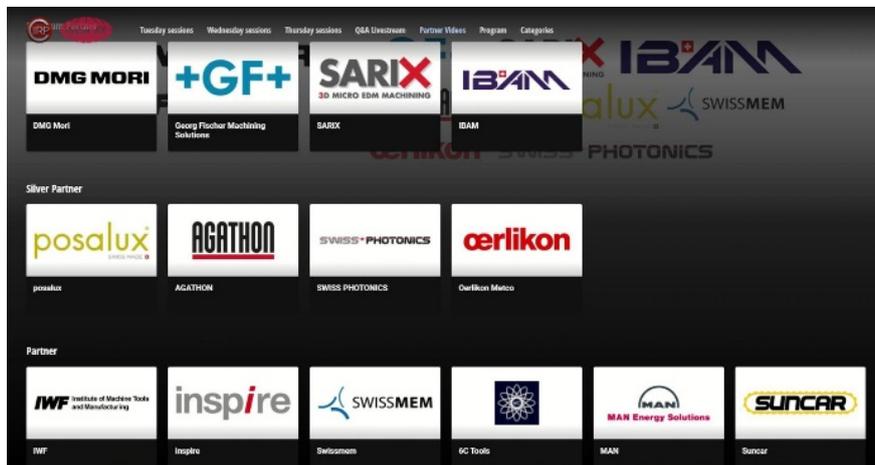
The emerging role of imaging in laser materials processing

Michael Schmidt

Reconstructing CNC platform for EDM machines towards smart manufacturing, W. Zhao (Shanghai Jiao Tong University)



The sponsors and companies / organizations who were willing to receive participants of the ISEM XX as visitors prepared virtual visits or online presentations of their companies.



Sponsors and virtual industry visits

ISEM is the only international conference dedicated to the electrical and chemical machining technologies, while large conferences exist for laser technology and additive manufacturing. But all these non-mechanical technologies have something in common, which makes this conference series in this composition indispensable: Characteristic is that tools are defined not by their geometry, but by differential field equations, where the boundary conditions are the geometry of the work piece. Concentrating energy to the process zone requires extreme gradients of state variables. Therefore Process understanding, process modelling and process observability becomes much more difficult and even simplifying meta models for the daily use in industry are lacking. Thus process modelling, process observation are major targets of actual ongoing research and have been presented in ISEM XX. These topics are not self-sufficient but aimed for a better control of the processes. Here also the re-discovered capabilities of artificial intelligence will complement and cooperate with physical modelling in future. Non-mechanical manufacturing technologies typically are considered to overcome weaknesses of conventional technologies mostly in terms

of materials, geometries, quality and surface integrity and even productivity. Research in this field as ISEM XX has demonstrated it therefore aims to further develop the strengths and overcome weaknesses of the individual technologies, which unites these technologies in trends beyond the everlasting tasks in manufacturing of increase of productivity, quality, reliability, scope of eligible materials and reduction of ecologic footprint.

In this respect a rich field of research work is still open and is capable to fuel ISEM XXI taking place in June 2022.

Greatly appreciated is the support of CIRP, the CIRP conformance committee, the international advisory board, the scientific advisory board, the sponsors, the session chair persons, the presenters for their contributions, all participants and the colleagues of the organizing committee of IWF, ETH Zürich.

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](#)

The other CIRP Conferences and Sponsored Conferences have been postponed later in the year. Please look through the above links to see the new dates.

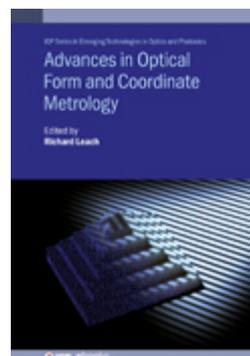
New books from our members

Advances in Optical Form and Coordinate Metrology

Richard Leach

Advances in Optical Form and Coordinate Metrology covers the latest advances in the development of optical form and coordinate measuring instruments plus the manipulation of point cloud data. The book presents some basic principles of the optical measurement methods and takes a deeper look at the operation of the instruments and the new application areas where they can be applied, with an emphasis on advanced manufacturing. Latest advances discussed include the drive towards faster instruments for in-process applications, the ability to measure highly complex objects (in e.g. additive manufacturing), performance verification and advances in the use of machine learning to enhance data analysis.

<https://iopscience.iop.org/book/978-0-7503-2524-0>

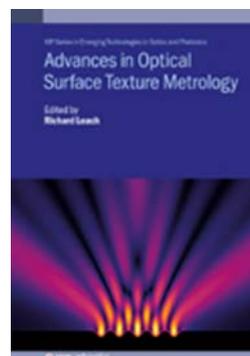


Advances in Optical Surface Texture Metrology

Richard Leach

Advances in Optical Surface Texture Metrology covers the latest advances in the development of optical surface texture measuring instruments. Rather than concentrate on the basic principles of the optical measurement methods, this book takes a deeper dive into the operation of the instruments and the new application areas where they can be applied, with an emphasis on advanced manufacturing. Latest advances discussed will include the drive towards faster instruments for in-process applications, the ability to measure highly complex surfaces (in e.g. additive manufacturing) and advances in the use of machine learning to enhance data analysis.

<https://iopscience.iop.org/book/978-0-7503-2528-8>



Life and Sciences

Elsó Kuljanić

From PREFACE of the book written by Janez Peklenik



Elsó Kuljanić, PhD in Mechanical Engineering as well as Professor Emeritus of the University of Rijeka, a fellow of the Croatian Academy of Science and Arts and fellow of CIRP - International Academy for Production Engineering, describes his life and his life-long research in Production Engineering. While reading the book the main idea a reader could get is the author's wish to connect research in production engineering with industry and the obtained results to be applied in practice. The author wanted to point out the role of his parents, teachers, and numerous research associates who have had an impact on his life and on his scientific and practical work in industry.

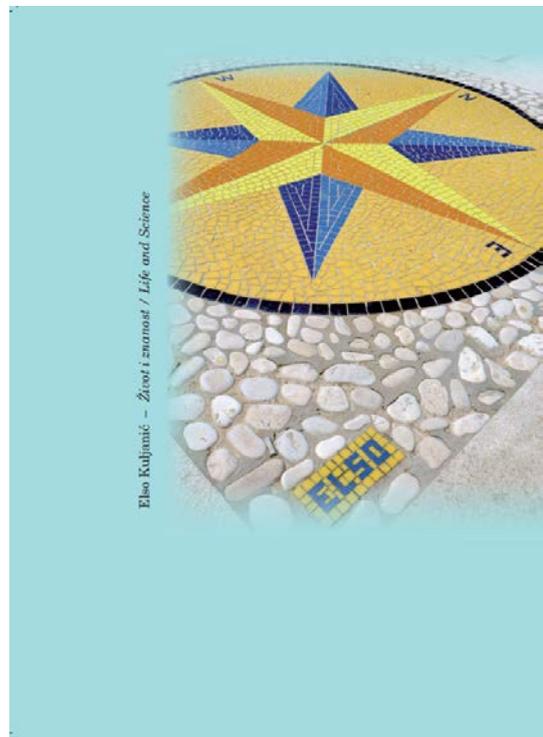
The most significant results of his research are presented in the book and they were published in the leading journals of the time in the field of production engineering. Also, it is presented

that Elsó Kuljanić worked with Neil Armstrong as both happened to be teaching at the University of Cincinnati in USA. A well-known professor Bertil Colding from the Royal Institute of Technology – KTH in Stockholm, a good friend of mine wrote to Elsó Kuljanić „I believe that you are the most prominent researcher on multi-tooth cutting in the world“.

Alongside all results that are put forth in this book, it is necessary to point out his outstanding achievements in the education of college students, his insistence on cooperation between science and industry and among scientists. He also organized International Conferences and post-graduate studies hence transferring enthusiasm and the “beauty” of research to both his students and associates which gave him satisfaction and happiness.

By hard and dedicated work throughout his life, Elsó Kuljanić has given an immense contribution to Croatian and international science in the field of Production Engineering.

This book could be instructive and interesting to many people regardless of age and education, it might give young scientists an impulse to be persistent in their pursuit of knowledge as well as the pursuit of finding pleasure in research.



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

- We kindly remind CIRP Fellows, Honorary and Emeritus, that they can propose candidates for the 2021 Taylor Medal up to May 1st 2021. You will find all information in [Art.19](#) of our Internal Regulations.
- This year for the first time the votes for the new Boards of STCs G and M will be made electronically through the CIRP Website. You will receive all information in due time.
- The electronic votes for the 2025 General Assembly's location will be held in May, and those for new Fellows will be held in June.
- We also remind you that next 70th CIRP General Assembly will be organized virtually by the German Organizing Committee.

Future CIRP Meetings

- Dates of the [future CIRP Winter Meetings](#) 2022 - 2025
- Dates of the [future CIRP General Assemblies](#) 2021 - 2024