



**The International Academy for Production Engineering**

# **NEWSLETTER**

**N° 64 – Autumn 2022**

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# From the President

Dear CIRP friends,

It is a real honor for me to take over the responsibility of President of CIRP, the International Academy for Production Engineering, for the year 2022-2023. I wish to thank you all for giving me the confidence to guide our academy in the coming year. Many thanks to the Board and Council, and especially to my predecessor, Professor Hans Hansen, who has efficiently led the academy in the past year. I also welcome the new Vice President Elect, Prof. Berend Denkena, and I'm looking forward to continuing the collaboration not only in the Board and the Council, but also in CIRP committees and working groups.

The 71st General Assembly held in Bilbao has for sure been a successful event. Many members and participants who were physically present enjoyed the multitude of scientific and technical discussions, the social events, and certainly the face-to-face meetings and networking opportunities. But as the meetings were organized in a hybrid form, those who were unable to come over could also take part virtually in the different sessions. I want to thank again the CIRP 2022 Organizing Committee, under the lead of Dr. Jokin Muñoa, for the excellent organization.



Based on this year's experience, proceeding two years of the pandemic situation where everything had to be organized in a virtual format, it became clear again that, besides the on-line meetings which have also proven their value, physical meetings such as the Winter Meeting in Paris, the General Assembly in August, as well as the many CIRP conferences, are essential for our CIRP community. Therefore, it has been decided that the upcoming Winter Meeting for 2023 will only be organized as a physical in-person meeting.

As I communicated during the closing ceremony of the General Assembly 2022, I will continue to support important on-going projects and activities to make CIRP ready for future challenges. We will give maximum attention to the way CIRP publishes, or should publish, its work in the future. Therefore, I would like to thank on the one hand the chairs and editors of the different publishing channels of CIRP, and on the other hand our community of members and research affiliates, who contribute to the publishing work as well as the reviews to be conducted. It is strongly acknowledged that high quality publications in the different CIRP dissemination channels are only possible, for example, through their excellent review work. Contributing to CIRP also in this way is an important characteristic of our CIRP family, which we should keep alive and continue to strengthen in the future.

Is CIRP properly prepared for the future and the rapidly changing world? Are we sufficiently in touch with the thinking and acting of the younger generations? What about diversity within CIRP? These were some of the few questions I raised during the last General Assembly meeting. I'm happy to hear that many of us take these questions to heart. It is also noteworthy to see that colleagues have initiated work on the role of women in production engineering, the progress of which will be reported in this Newsletter. Our academy will continue to direct its focus towards accomplishing other strategic objectives as well, such as attracting new members to CIRP.

The Newsletter is for sure a medium where we can communicate news from our members. Our Technical Secretary and CIRP Secretariat are happy to receive any relevant news (awards, prizes, new books, etc.) which will be included. In addition, we report annually about the CIRP awards, namely the CIRP F.W. Taylor Medal and the General Pierre Nicolau Award. Related to this point, I would certainly remind Fellows to propose and nominate candidates for these two prestigious awards, which also brings extra visibility to CIRP.

I wish you all an enjoyable reading of the 64th CIRP Newsletter, and hope to meet you in-person during the upcoming Winter Meetings in Paris.

With my best regards,

Bert Lauwers  
President of CIRP 2022-2023

# From the Editor

Dear CIRP colleagues,



Once again it is an honor to connect with you via the CIRP Newsletter. It was a joyous occasion to reunite with many friends and colleagues during the 71st CIRP General Assembly in Bilbao. We now look forward to our next gathering for scientific discussions and exchange of ideas during the upcoming 2023 Winter Meeting.

As the Editor of the CIRP Newsletter, I invite all members to submit their news relevant to our academy (e.g., news from members, awards, books written by members, etc.). Organizers of CIRP conferences are also asked to send a brief report (with highlights, pictures, etc.), to be featured in the Newsletter. The material can be sent to the CIRP office ([cirp@cirp.net](mailto:cirp@cirp.net)) or directly to myself ([kaane@uwaterloo.ca](mailto:kaane@uwaterloo.ca)).

I would also like to draw your attention to the section on our website “Education Portal”, meant as a medium to share relevant information related to manufacturing education.



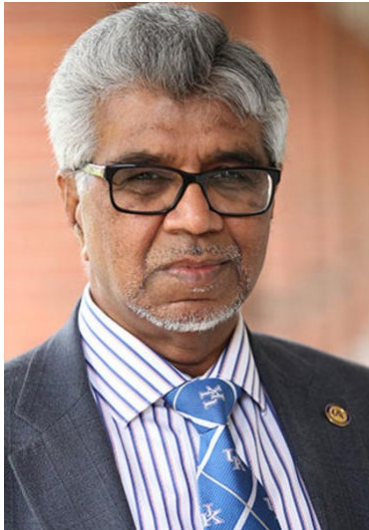
Any member who wants to contribute to this section is welcome to do so. Any relevant information can be sent to the CIRP Secretariat ([cirp@cirp.net](mailto:cirp@cirp.net)).

With my best regards,

Kaan Erkorkmaz  
CIRP Technical Secretary

# News from Members

## Professor I.S. Jawahir receives the SME 2022 Frederick W. Taylor Research Medal



Prof. I.S. Jawahir

The SME Frederick W. Taylor Research Medal honors significant published research leading to a better understanding of materials, facilities, principles, operations, and their application to improve manufacturing processes. Each year since 1957, one researcher is selected for this award internationally. Professor I. S. Jawahir, James F. Hardyman Chair in Manufacturing Systems and Director of the Institute for Sustainable Manufacturing, was awarded with the 2022 SME Frederick W. Taylor Research Medal.

Prof. Jawahir's current research includes predictive modeling and optimization of sustainable manufacturing processes and product design for sustainability and circular economy. He is a Fellow of CIRP, ASME and SME, Technical Editor of the journal *Machining Science and Technology*, and Editor-in-Chief of the *International Journal of Sustainable Manufacturing*.

For over three decades, Prof. Jawahir has also been actively engaged in CIRP's collaborative research. He has led four major CIRP research groups (Chip Control WG, 1990-93; Modeling of Machining Operations WG, 1995-01; Surface Integrity WG, 2008-11; IMPACT WG - Integrated Machining Performance for the Assessment of Cutting Tools, 2021-24). He also founded the CIRP Conference Series on Modeling of Machining Operations in 1998 and co-founded, with Professor

E. Brinksmeier, the CIRP Conference Series on Surface Integrity in 2012. Professor Jawahir has received numerous awards for his research and contributions to manufacturing engineering, including the 2013 ASME Milton C. Shaw Manufacturing Research Medal and the 2015 William Johnson International Gold Medal.



<https://www.engr.uky.edu/news/2022/05/i-s-jawahir-awarded-2022-frederick-w-taylor-research-medal>

<https://www.sme.org/aboutsme/awards/international-honor-awards/2022-sme-international-honor-award-winners/>



## **Professor Kaan Erkorkmaz receives Honorary Title ‘TUM Ambassador’ from the Technical University of Munich**



Erkorkmaz with TUM President Prof. Thomas Hofmann.

Prof. Erkorkmaz was recently named “TUM Ambassador” by the Technical University of Munich (TUM). This honorary title is conferred upon distinguished international guest researchers who have “enriched the institutes and academic life at TUM with their scientific expertise, international experience, and their commitment to the institutional development of universities”. TUM Ambassadors are acknowledged as representatives of all TUM Research Alumni around the world.

During the weekend of July 16-17, 2022, TUM President Thomas F. Hofmann honored the eleven TUM Ambassadors of 2022 at the Vivat TUM summer concert, on the stage of the Isarphilharmonie in front of nearly 2,000 visitors. At the ceremony, Prof. Erkorkmaz was recognized as a “worldwide leading scientist in the field of control theory and its application to machine tools.”

Since 2018, Prof. Erkorkmaz has been collaborating with the TUM Institute for Machine Tools and Industrial Management (*iwb*), headed by Prof.-Dr. Michael Zäh, where he was a visiting professor during his sabbatical leave from the University of Waterloo in 2019-2020.

Erkorkmaz conducts research in machine tool dynamics, system identification, machine and process control, trajectory planning, precision mechatronics, and process modeling. He has been a Fellow member of CIRP since 2014, and currently serves as the Secretary of STC-M, the Technical Secretary of CIRP, and on the Editorial Committee of the CIRP Annals.



Prof. Zäh and Prof. Erkorkmaz.

# General Assembly 2022

The 71st CIRP General Assembly (GA) was held in Bilbao in hybrid format and was successfully managed by the organizing team, headed by Dr. Jokin Muñoa from Ideko, Dr. Pedro Arrazola from Mondragon University, Dr. Luis Uriarte from Tekniker, and Dr. Jose Antonio Yagüe-Fabra from the University of Zaragoza.

Spread over seven days, the GA was attended by 522 participants, 383 of which were in-person, and 139 on-line; representing a total of 35 countries. The GA had 17 sponsors, featured 10 keynotes, and 126 paper sessions. Held at Bilbao exhibition center, the social program of the GA also featured the Assembly Dinner at Euskalduna Palace and the Farewell Dinner at the beautiful grounds of the Loizaga Tower.

From the opening ceremony and welcome reception...



CIRP Presidents Prof. Bert Lauwers (2022-23) and Prof. Hans N. Hansen (2021-22) at the Assembly Meeting.





From the assembly dinner and farewell dinner...



Comments from the GA participants:

*"It was so wonderful to be with production engineering scientists, engineers and entrepreneur colleagues and their families after two plus years of gap due to pandemic"*

*"It was really fun to be at CIRP 2022. Nothing beats in-person!"*

*"Congratulations, Jokin and the team. It was a great conference and Bilbao is a wonderful city."*

*"The conference was super!! I really enjoyed it 😊"*

*"It's been a wonderful GA! Compliments to you and the whole organizing team!"*

*"I hope that you have managed to get some rest after the brilliant job that you and colleagues did in hosting a most memorable GA for us."*



Big thanks to the organizing team!



# CIRP Awards

The **General Pierre Nicolau Award for 2022** was presented to **Dr. Yavuz Murtezaoglu**. Dr. Murtezaoglu, is the managing director and founder of ModuleWorks GmbH. He has made truly transformative impacts in the fields of Computer Aided Manufacturing, machine tools, and in manufacturing research.



Dr. Murtezaoglu receiving the General Pierre Nicolau Award from the President of CIRP, Prof. H.N. Hansen.

Dr. Murtezaoglu's significant contributions in the area of 5-axis tool path generation and the capability to develop industry-proven solutions based on this expertise are both key factors for his contribution to CAD/CAM and CNC technologies. He has been able to build a company with more than 150 employees working in the area of 5-axis tool path generation and simulation, and supplied these technologies to CNC control makers like Mitsubishi, Fanuc, Siemens, and Bosch Rexroth. In addition to this, around 80% of all worldwide CAM software vendors, like Mastercam, PTC, Siemens, Cimatron are using his technology. Furthermore, Dr. Murtezaoglu is a Corporate Member of CIRP since 2014 and currently the Chair of CMAG.

We earnestly congratulate Dr. Murtezaoglu for his outstanding contributions to the field of production engineering, which is recognized by CIRP's General Pierre Nicolau Award.



Dr. Murtezaoglu during his award acceptance address.

The **F.W. Taylor Medal for 2022** has been awarded to **Mr. Gorka Ortiz-de-Zarate**, Mondragon University, Spain, for his paper: “A novel methodology to characterize tool-chip contact in metal cutting using partially restricted contact length tools”, presented in the STC-C session of the virtual CIRP General Assembly held in Munich in 2021.

The paper was co-authored by Dr. Madariaga, Prof. Arrazola and Prof. Childs. The paper presents a novel methodology and validation with broad scientific and technical application, namely the experimental determination (with reliable accuracy) of normal/friction stress distribution in the cutting tool in machining. From a scientific point of view, determining tool-chip friction in metal cutting is essential to understanding thermomechanical loads, tool wear, and surface integrity. In this framework, the methodology presented in the paper could represent a scientific breakthrough in the understanding and characterization of tool-chip friction.



Mr. Ortiz-de-Zarate with his Taylor Medal.



Mr. Ortiz-de-Zarate receiving the F.W. Taylor Medal from the President of CIRP, Prof. H.N. Hansen.

We sincerely congratulate Mr. Ortiz-de-Zarate on his outstanding scientific work, which has been recognized by the CIRP F.W. Taylor Medal.

# Elections approved at the General Assembly Meeting 2022

## **2022-2023 Board and Council members**

President	Prof. B. Lauwers
Vice President	Prof. F. Fang
Vice President Elect	Prof. B. Denkena
Past President	Prof. H. Hansen
Secretary General	Prof. D. Dumur
Treasurer	Prof. K. Erkorkmaz
Technical Secretary	Prof. D. Biermann
Council Members	Prof. M. Hauschild
	Prof. M. Kunieda
	Prof. S. Smith
	Prof. T. Tolio
	Prof. J. Vancza

## **Elected Fellows**

Prof. D.M. Chun (Korea)  
Dr. A. Donmez (USA)  
Assoc. Prof. A. Ghiotti (Italy)  
Dr. C. Guo (USA)  
Prof. L. Madej (Poland)  
Prof. R. Stark (Germany)  
Prof. W. Volk (Germany)

## **New Associate Members**

Prof. M. Bambach (Switzerland)  
Dr. Y-L. Chen (China)  
Prof. B. Epureanu (USA)  
Prof. A. Fischer (Germany)  
Prof. P. Guo (USA)  
Dr. N. Irino (Japan)  
Prof. M. Liewald (Germany)  
Dr. M. Sealy (USA)  
Assoc. Prof. X. Vincent Wang (Sweden)

## **Honorary Fellow**

Prof. M. Mitsuishi (Japan)

## **Fellows Emeritus**

Prof. M. Balazinski (Canada)  
Prof. A. Bernard (France)  
Dr. M. Rahman (Singapore)  
Prof. Y. Shimomura (Japan)  
Prof. F. Vollertsen (Germany)

## **New Corporate Members**

ELGAN - Diamantwerkzeuge GmbH & Co. KG (Germany)  
IconPro (Germany)  
Konoike Transport Co. (Japan)  
Mitutoyo Europe (Germany)  
QIAP (China)

## **New Research Affiliates**

Dr. S. Harst (Germany)  
Dr. T. Hüsemann (Germany)  
Prof. C. Kang (China)  
Dr. X. Li (USA)  
Dr. F. Liu (UK)  
Dr. S. Peukert (Germany)  
Dr. S. Shafiee (Denmark)  
Dr. R. Tabar (Sweden)  
Dr. J. Wang (China)  
Dr. W. Xie (UK)  
Assoc. Prof. J. Zhang (China)  
Dr. P. Zheng (Hong Kong)

## **New STC Officers**

STC C:	Prof. S. Melkote (Ch), Prof. P. Arrazola (V-Ch), Prof. V. Schulze (Sec)
STC Dn:	Prof. T. Tomiyama (Ch), Prof. N. Anwer (V-Ch), Dr. A. Liu (Sec)
STC F:	Prof. J. Yanagimoto (Ch), Prof. S. Bruschi (V-Ch), Prof. B. Kinsey (Sec)
STC P:	Prof. A. Archenti (Ch), Prof. Y. Takaya (V-Ch), Prof. E. Morse (Sec)
CMAG:	Dr. Y. Murtezaoglu (Ch), Dr. L. Uriarte (V-Ch), Prof. K. Erkorkmaz (V-Ch), Dr. Y. Nonaka (Sec)



## **CIRP Committees**

### Membership Committee - Credentials Subcommittee:

Profs. P. Arrazola, M. Merklein, N. Michailidis, J. Sutherland, Y. Takaya

### Membership Committee - Nominations Subcommittee:

Profs. D. Biermann, S. Bruschi, J.-M. Linares, A. Matsubara, S. Smith

### Editorial Committee:

Profs. J. Aurich, M. Davies, K. Erkorkmaz, X. Jiang, S. Kara (Chair), I. Lazoglu, D. Lucca, P. Martins, N. Michailidis, R. M'Saoubi, M. Nakao, S. Newman, K. Rajurkar, J. Vancza (Vice-Chair)

### Taylor Medal Committee:

Profs. C. Brecher, D. Brissaud (Chair), K. Erkorkmaz, Y. Takaya, R. Wilhelm

# Advancing the Role of Women in Production Engineering

(by Prof. Ajay Malshe)

Diversity and inclusion in all forms, including gender, color, discipline, race, and culture, are essential for the wholesome and equitable creation of a talent pool and workforce. In this sense, elevating the role of women in production science and engineering is a critical matter which requires urgent attention. CIRP, in upholding universally accepted norms of inclusivity, also has a responsibility to lead the way for the next generation of production engineering scholars and leaders, through the equitable participation of women in this field. Currently, only 53 out of a total of 685 CIRP members (including corporate members) and research affiliates are women, with Prof. Hoda ElMaraghy (from Canada) being the first elected female Fellow member.



*Photo:* Assembly of colleagues over an invited lunch during the 2022 CIRP GA meeting to discuss the advancement of the role of women in production engineering.

With this backdrop, and the aim to increase the diversity of CIRP as an academy, the first meeting of interested female and male CIRP colleagues took place during the 2022 CIRP General Assembly. The meeting was organized by Prof. Malshe (USA) for his interest in elevating the representation and role of women in production engineering, and based on his discussions with women Fellows of CIRP, including Prof. Jian Cao (USA), Prof. Stefania Bruschi (Italy), Prof. Marion Merklein (Germany), and Prof. Brigid Mullany (USA). The meeting was attended and supported by several CIRP colleagues, including Prof. Hans Hansen (President of CIRP, 2021-22).

The discussions were collegial, inclusive, and productive, in which every participant had the opportunity to openly share their experiences. The topics discussed included:

- (1) Challenges (such as unconscious bias) and also the opportunities which women experience in building a career in production engineering.
- (2) Proactive guidance and support female colleagues have received from other women, and men, active in this field.
- (3) The importance of continuing this initiative within CIRP, with the support and participation of the leadership and members of the CIRP community.
- (4) Intentional recruitment of more women into the field of production science and engineering, to help strengthen the future workforce in this field.

The meeting concluded with the intention of reconvening at the 2023 Winter Meeting and the 2023 General Assembly, in order to continue building awareness and momentum on this important initiative within CIRP.

Anecdotal references for further reading can be found from:

[1] More women in manufacturing jobs in every age group  
<https://www.census.gov/library/stories/2022/10/more-women-in-manufacturing-jobs.html>

[2] Promoting gender balance in the manufacturing sector - EIT Manufacturing  
<https://www.eitmanufacturing.eu/news-events/news/promoting-gender-balance-in-the-manufacturing-sector/>

[3] The future of women in Asia's workforce  
<https://www.mckinsey.com/featured-insights/asia-pacific/the-future-of-women-in-asias-workforce>

[4] Women in the workforce: An unmet potential in Asia and Pacific  
<https://www.adb.org/sites/default/files/publication/158480/women-workforce-unmet-potential.pdf>

[5] Manufacturing leaders call for more women to join their ranks (Australia)  
<https://www.afr.com/companies/manufacturing/manufacturing-leaders-call-for-more-women-to-join-their-ranks-20220717-p5b26u>

# From the Editorial Committee

(by Prof. S. Kara, EC Chair)



Bilbao General Assembly in August 2022 was a wonderful opportunity to catch up with the CIRP and the Editorial Committee colleagues in-person. COVID has brought up the human side of us and made us realize the importance of in-person meetings, despite the advancement in communication technologies.

The Editorial Committee has had few changes in the last year. Professors Julian Allwood, Joost Duflou and Rajkumar Roy have completed their terms in the Editorial Committee. It has been an immense pleasure working with them. Furthermore, I would like to take this opportunity to thank them for their excellent service, collegiality, and support over the years. Professors Jan Aurich, Ismail Lazoglu, and Stephen Newman have kindly accepted to join the Editorial Committee. I welcome all three of them in their new role and look forward to working with them, together with the rest of the EC committee to serve the CIRP.

## The 2023 EC review process

With the Elsevier Editorial Manager system successfully implemented, the planning of the 2023 paper review process is underway and we are looking forward to the 2023 Winter Meeting. The challenges associated with the COVID-19 pandemic have started easing. As a result, the Editorial Committee meeting has been planned in-person, preceding the 2023 Winter Meeting.

## CIRP publications and quality

As a result of feedback from the CIRP community and consultations, the CIRP Annals Vol 2 authorship rule has been changed and the changes have been approved by the CIRP Council. The use of a CRediT statement will be introduced starting from 2023 keynote paper submissions, as referenced in the [CIRP Internal Regulations](#). This will bring the CIRP Annals publications in line with the authorship requirements of other high-quality journals.

As reported earlier, the new task force to improve the quality of CIRP papers has continued its work and made significant progress, after a series of consultations with the broader CIRP community. Thus, a resulting first step has been the cancellation of the printing of the CIRP Annals – with an exception for those members who wish to receive a printed copy. This will remove the constraints related to printed copies and pave the way to introducing further changes towards improving the quality of CIRP publications.

# From the CMAG Group



Dr. Yavuz Murtezaoglu  
Chair



Dr. Luis Uriarte  
Vice-Chair



Dr. Youichi Nonaka  
Secretary

The CMAG meeting at the General Assembly in Bilbao was held on August 23<sup>rd</sup>. At the beginning of the meeting Prof. Hansen (CIRP President) remarked the need for sustainability and carbon neutrality as production targets. Further, he focused on maintaining the collaboration between academia and industry.

We had three technical presentations:

1. Intelcut: Digital Twin for machining process monitoring and control by Professor Altintas (UBC).

Prof. Altintas presented an on-going collaborative work on Industrial Digital Transformation with Fraunhofer machine tool (IWU) and IT (IESE) institutes, in order to realize a fully operative digital twin-based machine tool monitoring technology. This is a technology development project based on the integration of previously completed scientific works.

2. INTERQ: Interlinked Process, Product and Data Quality framework for Zero-Defects Manufacturing (Dr. Muñoa) presented by Dr. Beudaert (IDEKO).

Dr. Beudaert (IDEKO) presented the preliminary results of the on-going European project INTERQ, which deals with the integration of data acquisition from the product and the process.

3. Delivering on Sustainability Targets through the Achievement of Global Best Practice in the Management of Industrial Research, Development, and Innovation by Professor Byrne (UCD).

Prof. Gerry Byrne (UCD) presented some thoughts and ideas for discussion as sustainability is the hottest topic within productive industry and consequently.





A snapshot from the CMAG meeting in Bilbao (August 2022).

In the final section of the meeting, the elections for new CMAG officers took place. Prof. Erkorkmaz (CIRP Technical Secretary) invited all CMAG participants to join him in thanking Dr. Fujishima for his outstanding leadership, sharing his vision with CMAG, and his six years of dedicated service to CMAG.

Following new officers were elected and approved by the Council:

Dr. Yavuz Murtezaoglu – New Chairman  
 Dr. Luis Uriarte – New Vice-Chairman  
 Dr. Youichi Nonaka – New secretary

Corporate members are organized by 171 organizations and companies.

We are looking forward to seeing you at the CMAG session that will be held on February 23rd in Paris.



CMAG Officers with CIRP President Prof. Hansen (2<sup>nd</sup> from right), after completion of Dr. Fujishima's service as CMAG Chair.

# From the Research Affiliates

## Message from the RA Steering Committee



Dr. Alborz Shokrani  
Chair



Dr. Till Clausmeyer  
Vice-Chair

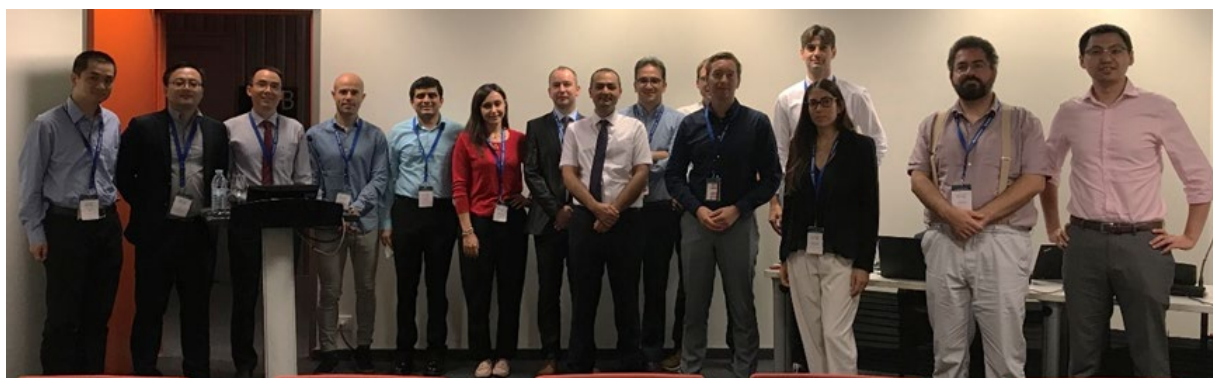


Dr. Amir Malakizadi  
Secretary

Dear Research Affiliates, Dear CIRP Colleagues,

It was great to be able to meet and interact with colleagues and friends again in person at the CIRP General Assembly. The RA meeting was held in a hybrid format with in-person and online participation of the RAs. The meeting commenced with the updates from the RA board and followed by reports on the CIRP RA workshop, CIRPe conferences, and the RA collaborating working groups.

The RAs approved the next RA workshop to be hosted at the University of Padova. The RA workshop in 2023 will be organized during 8-9 June and is led by Dr. Rachele Bertolini, Dr. Enrico Simonetto, and Dr. Filippo Zanini. This is one of the flagship activities of the RA community, with the aim of developing new collaborations which may lead into joint research projects and publications. Proposals have been received for hosting the RA workshop in 2024, which will be considered during the Winter meeting.



2022 RA GA Meeting in Bilbao, conducted in hybrid format (in-person and via Zoom)

The CIRP Global Web Conference, CIRPe 2022, led by Dr. Amir Malakizadi was successfully held during 25-27 October. The conference featured six keynotes, two of

which were based on RA collaborative working groups. The planning for the CIRPe 2023 is now on-going. Dr. Salil Bapat from Purdue University is leading the organization, which will be held in Oct 2023, with abstract submissions opening in Feb 2023. We would like to encourage our CIRP colleagues to continue supporting and participating in these conferences.

At the CIRP GA RA meeting, two new collaborative working groups have been approved. These will focus on Material Processing, and Metrology and Engineering Education. Lastly, the CIRP Council approved to extend the programme of the RAs who joined before the CIRP GA 2022 by an additional year, except for those who have just been renewed for three years. This would enable the RAs affected by the COVID-19 restrictions to further engage with the CIRP community and embrace the opportunities provided by CIRP.

The RA Steering Committee.

## **10th CIRPe Global Web Conference 2022**

The 10th CIRP Global Web Conference (CIRPe 2022, <https://www.chalmers.se/en/centres/MCR/cirpe>), was held during October 25-27 in a hybrid format, allowing the students, researchers, and engineers who reside in Sweden to participate in person. The event was broadcast online for participants around the globe in two parallel sessions.

64 abstracts were received from leading universities in 12 countries. The scientific committee recommended 40 papers for publication in Procedia CIRP and oral presentation. The conference program can be found at: <https://www.chalmers.se/en/centres/MCR/cirpe/Pages/Programme.aspx>. Six keynote presentations were contributed, originating from Volvo Group, Sandvik Coromant, Elsevier, Chalmers Area of Advance – Production, and CIRP Research Affiliate initiatives.

## **11th CIRPe Global Web Conference 2023**

The 11th CIRPe Global Web Conference will be organized by Dr. Salil Bapat from Purdue University, USA, on 24-26 October 2023 (tentative dates). Drs. Ajay Malshe (Purdue) and Scott Smith (Oak Ridge National Labs) are the supporting CIRP Fellows. This will be the first time that this event is hosted in the United States.

The conference will be centered around the theme of “Emerging trends in manufacturing: Strategies, processes, and applications” with the following technical tracks: 1) Resilient manufacturing: Continued learning from the COVID-19 pandemic 2) Hybrid manufacturing, and 3) Biologicalization and Biomanufacturing. Additionally, a separate track will be focused on “engineering education in manufacturing”. A detailed description of subtopics, key dates, and submission details will be disseminated in the coming months.

## **Save the date for the 15<sup>th</sup> CIRP RA Workshop 2023**

The next RA Workshop will be held in Padova from June 8 until June 9, 2023. The schedule is to have a physical meeting together with a tour of the labs for precision and micro-manufacturing located in Padova and in Rovigo.

The topic of the event will be two-fold. One discussion topic will be related to finding pathways for improving education in engineering, while the other one will focus on the importance of sustainability in manufacturing nowadays. The event is supported by the Precision Manufacturing Group, the University of Padova, which has four CIRP Fellows and one CIRP Associate Member.

The local organization comprises three RAs from the University of Padova: Dr. Rachele Bertolini, Dr. Enrico Simonetto, and Dr. Filippo Zanini.

# CIRP Keynote Papers

Our keynote papers are the result of an intensive collaboration between specialists working together during several years within an STC or CWG. 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.

## 2023 Keynote Papers

### STC A

**Automated assembly of non-rigid objects** - S. Makris (2) - Contact: [makris@lms.mech.upatras.gr](mailto:makris@lms.mech.upatras.gr)

### STC C

**Digital twin for cutting processes** - T. Bergs (2) - Contact: [t.bergs@wzl.rwth-aachen.de](mailto:t.bergs@wzl.rwth-aachen.de)

### STC Dn

**Biologicalization driven product designs** - A. Malshe (1) - Contact: [amalshe@purdue.edu](mailto:amalshe@purdue.edu)

### STC E

**Digital twin for electro-physical and chemical processes** - Y. Guo (1) - Contact: [yuebin.guo@rutgers.edu](mailto:yuebin.guo@rutgers.edu)

### STC F

**Plasticity and future of stress superposition in metal forming** - E. Tekkaya (1) - Contact: [Erman.Tekkaya@iul.tu-dortmund.de](mailto:Erman.Tekkaya@iul.tu-dortmund.de)

### STC G

**Grinding of composites materials** - B. Zhang (1) - Contact: [zhangb@sustech.edu.cn](mailto:zhangb@sustech.edu.cn)

### STC M

**Sensor and actuator integrated tooling systems** - F. Bleicher (2) - Contact: [bleicher@ift.at](mailto:bleicher@ift.at)

### STC O

**Platform based manufacturing** - T. Tolio (1) - Contact: [tullio.tolio@polimi.it](mailto:tullio.tolio@polimi.it)

### STC P

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

### STC S

**Modelling and simulation of surface generation in manufacturing processes** - G. Tosello (2) - Contact: [guto@mek.dtu.dk](mailto:guto@mek.dtu.dk)

### Cross-STC

**Biologicalisation in manufacturing - Current state and future trends** - K. Wegener (1) - Contact: [wegener@iwf.mavt.ethz.ch](mailto:wegener@iwf.mavt.ethz.ch)



# 2024 Keynote Paper Proposals

## STC A

**Implementing circular economy activities in manufacturing for environmental sustainability** - T. Sakao (2) - Contact: [tomohiko.sakao@liu.se](mailto:tomohiko.sakao@liu.se)

## STC C

**Sustainable machining** - P. Arrazola (1) - Contact: [pjarrazola@mondragon.edu](mailto:pjarrazola@mondragon.edu)

## STC Dn

**Scientific foundation of data science for engineering design** - A. Liu (2)  
Contact: [ang.liu@unsw.edu.au](mailto:ang.liu@unsw.edu.au)

## STC E

**Dynamic beam shaping in laser processes** - M. Schmidt (2) -  
Contact: [michael.schmidt@lpt.uni-erlangen.de](mailto: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](mailto:jcao@northwestern.edu); [marion.merklein@fau.de](mailto:marion.merklein@fau.de)

## STC G

**Advances in modelling of fixed abrasive processes** - P. Krajnik (2) -  
Contact: [krajnik@chalmers.se](mailto:krajnik@chalmers.se)

## STC M

**Hybrid metal additive-subtractive machine tools and applications** - S. Smith (1) -  
Contact: [smithss@ornl.gov](mailto:smithss@ornl.gov)

## STC O

**Virtualization and autonomy in manufacturing systems** - G. Putnik (2) -  
Contact: [putnikgd@dps.uminho.pt](mailto:putnikgd@dps.uminho.pt)

## STC P

**Integrated metrology for advanced manufacturing systems** - A. Archenti (2) -  
Contact: [archenti@kth.se](mailto:archenti@kth.se)

## STC S

**Surface conditioning in cutting and abrasive processes** - V. Schulze (2) -  
Contact: [volker.schulze@kit.edu](mailto:volker.schulze@kit.edu)

## Cross-STC

**Artificial intelligence in manufacturing**

## Cross-STC

**Industrial symbiosis in discrete manufacturing**

# 2025 Keynote Paper Proposals

## STC A

**Human-centric assembly in smart factories** - L. Wang (1) - Contact: [lihui.wang@iip.kth.se](mailto:lihui.wang@iip.kth.se)

## STC C

**Integrated machining performance for assess. of cutting tools (IMPACT)** - I.S. Jawahir (1) - Contact: [is.jawahir@uky.edu](mailto:is.jawahir@uky.edu)

## STC Dn

**Digital twins for engineering design** - N. Anwer (2) -  
Contact: [nabil.anwer@ens-paris-saclay.fr](mailto:nabil.anwer@ens-paris-saclay.fr)

## STC E

**Overcoming barriers to the implementation of multi-material additive manuf. (MMAM)** - A. Clare (2) - Contact: [adam.clare@nottingham.ac.uk](mailto:adam.clare@nottingham.ac.uk)

## STC F

**Cut the scrap: use less metal well** - J. Allwood (1) -  
Contact: [Allwood-Office@eng.cam.ac.uk](mailto:Allwood-Office@eng.cam.ac.uk)

## STC G

**Advances in magnetic-field assisted finishing** - H. Yamaguchi (2) -  
Contact: [hitomiy@ufl.edu](mailto:hitomiy@ufl.edu)

## STC M

**Fixtures and clamping systems in machining** - H.C. Möhring (2) -  
Contact: [hc.moehring@ifw.uni-stuttgart.de](mailto:hc.moehring@ifw.uni-stuttgart.de)

## STC O

**Future-proof production scheduling and control** - M. Urgo (2) -  
Contact: [marcello.urgo@polimi.it](mailto:marcello.urgo@polimi.it)

## STC P

**Dimensional metrology based on ultrashort pulse laser and optical frequency comb** - W. Gao (1) - Contact: [gaowei@cc.mech.tohoku.ac.jp](mailto:gaowei@cc.mech.tohoku.ac.jp)

## STC S

**Finishing of complex surfaces by shape-adaptive processes** - J. Yan (2) -  
Contact: [yan@mech.keio.ac.jp](mailto:yan@mech.keio.ac.jp)

## Cross-STC

**Production technologies and systems for e-mobility**

# 2026 Keynote Paper Proposals

## STC A

**Decarbonisation of manufacturing towards net zero** - S. Thiede (2) -

Contact: [s.thiede@utwente.nl](mailto:s.thiede@utwente.nl)

## STC C

**Part distortion in machining: prediction, measurement, and control** - J. Outeiro (1) -

Contact: [jose.outeiro@ensam.eu](mailto:jose.outeiro@ensam.eu)

## STC M

**Digital twins for machine tools** - A. Verl (2) - Contact: [alexander.verl@isw.uni-stuttgart.de](mailto:alexander.verl@isw.uni-stuttgart.de)

## STC P

**Machine learning in production metrology** - G. Lanza (1) - Contact: [gisela.lanza@kit.edu](mailto:gisela.lanza@kit.edu)

# Our CIRP Conferences

## 21<sup>st</sup> CIRP Conference on Electro Physical and Chemical Machining (ISEM, June 2022, Switzerland)

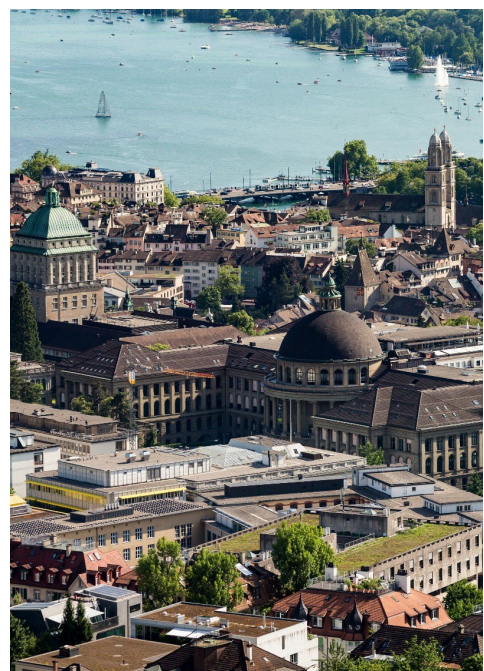
The 21th CIRP conference on Electro Physical and Chemical Machining, ISEM XXI, took place in Zurich during June 14-17, 2022. It was structured as a hybrid conference which enabled full in-person participation, as well as on-line participation for colleagues who were not able to travel due to COVID restrictions.

ISEM XXI, with 187 participants attending from 19 countries, was smaller in size than the ISEMs before. This was possibly due to the short duration of only 1.5 years since the shifted ISEM XX, and also COVID-related travel constraints. Nevertheless, participants who were asked in advance strongly voted in favor of an in-person conference, and participants who were able to attend in person also confirmed their preference for this format – despite the fact that from among 101 accepted papers, 35 were presented online. In scheduling the presentation sessions, first priority was on the topic, and the second on the presentation format (in-person vs. on-line). This enabled for the in-person sessions to run without technical problems. While during some online presentations occasional difficulties were encountered due to internet connection problems, they were overcome by playing the pre-recorded videos of the presentations required from all authors making online presentations.

The conference covered 3 days with presentations, with plenary lectures featuring the 6 keynotes, followed by three parallel breakouts. The conference ended on the fourth day, with a visit to the labs of IWF, inspire, of MAN energy solutions AG, and suncar AG.

From the 122 papers received 101 were accepted and grouped into the following sessions:

- 4 sessions on Additive manufacturing
- 3 sessions on special technologies
- 3 sessions on electrochemical machining, including micro machining and electrochemical discharge machining
- 13 sessions on EDM, including EDM drilling and milling and wire EDM, covering simulations and fundamental research
- 2 sessions on laser ablation technology
- 1 session was mixed with EDM and laser ablation.



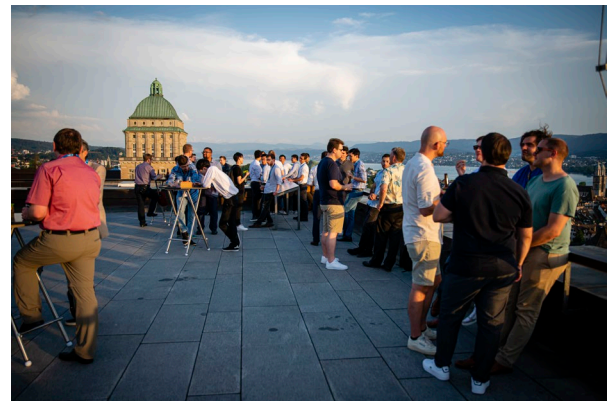




#### Keynotes:

- U. Maradia (GF MS): Evolution of EDM through technology push and application pull
- A. Clare (University of Nottingham): The electrolyte jet - a tool for machining and measurement
- E. Uhlmann (J. Polte) (TU Berlin): Novel advances in machine tools, tool electrodes and processes for high-performance and high-precision EDM
- Schubert (TU Chemnitz): Developments in powder mixed EDM and its perspective application for targeted surface modification
- J.-H. Schleifenbaum (RWTH Aachen): Rapid alloy development
- M. Bambach (ETH Zürich): AM+X: potentials of combining additive and die-based manufacturing processes

An introductory speech from the session chair Konrad Wegener, and a representative of the Swiss industrial association of machine building electrical and metal working industries, Jean-Philippe Kohl, made the opening. In the opening, Switzerland, its mechanical engineering and machine tool building tradition, ETH Zürich, IWF, and inspire AG were shortly characterized. Also, it was pointed out that the non-conventional technologies have in common that their tools are highly concentrated physical energy fields, where the workpiece provides boundary conditions. Therefore, approaches for modeling, simulation, process control, and observation of the process zone are similar, or at least can cross fertilize each other. These topics are not self-sufficient, but aimed for better control of the processes. This raises the demand for such a joint conference for these process technologies. ISEM is the only international







conference dedicated to the electrical and chemical machining technologies, while large conferences exist for laser technology and additive manufacturing. ISEM XXI revealed, in terms of scientific content, a strong increase of AI-applications in all process technologies for the development of process parameters. Also, that physical modeling approaches showed good progress. Process monitoring and development of suitable sensors was presented. Furthermore, the influence of the media, especially in ECM and EDM, merits attention in experiments and modeling. In AM, a tendency towards development of tools to predict the process results for different alloys, and to use that vice versa for the optimization of alloys and process parameters, could be observed. One paper introduced a cutting process that was significantly enhanced, by flooding the process zone with electrical discharge nitrogen plasma. Progress could also be seen in EDM of low conductivity materials. The prediction of discharge locations as a prerequisite to steer the surface properties can be considered as a significant step. Also, the shaping of individual pulses enabled by the availability of fast controls points towards future productivity increase in EDM.

Non-mechanical manufacturing technologies typically are considered to overcome weaknesses of conventional technologies, mostly in terms of materials, geometries, quality, surface integrity, and even productivity. Research in this field, as ISEM XXI demonstrated, aims to further the strengths and overcome weaknesses of the individual technologies, which unites these approaches in trends for accomplishing the everlasting objectives of manufacturing, i.e., increasing the productivity, quality, reliability, scope of feasible materials, and the reduction of ecological footprint.

The social events flanking the conference enabled a come together on the poly-terrace with a barbeque and excellent weather. The conference dinner was held in the "Zunftthaus zum Rügen" at the Limmatquai promenade, and the networking event took place on the roof of the main building of ETH Zurich. 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.

Konrad Wegener  
Conference Chairman ISEM XXI

## **17<sup>th</sup> CIRP Conference on Computer Aided Tolerancing (CAT, June 2022, France)**

The French-German Institute for the Industry of Future (Arts et Métiers Institute of Technology & Karlsruhe Institute of Technology) has organized the 17<sup>th</sup> CIRP Conference on Computer Aided Tolerancing. The objective of the conference was to provide an international forum for researchers to share and discuss visions, to disseminate recent advances, views and perspectives, and thus, to generate a significant impact on variability management in the context of Industry 4.0.



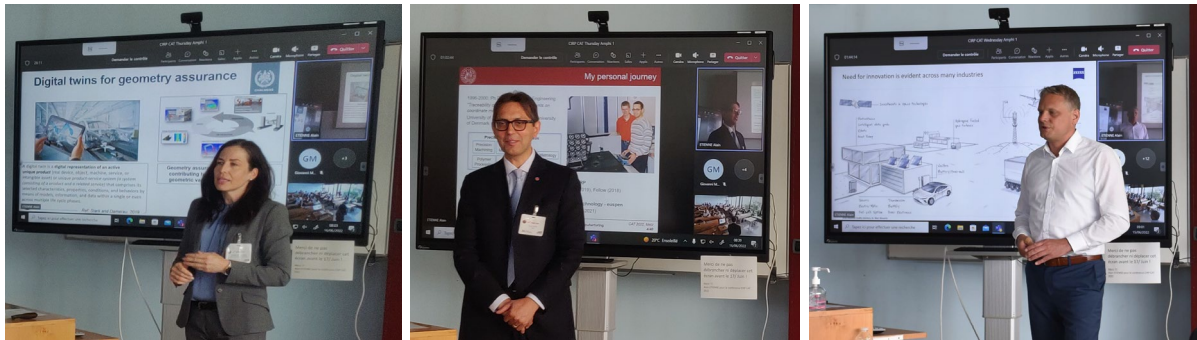
Tolerancing has a long history in research and practice, and advances in the computational power to assist complex analyses and simulations have given the field a strong new trajectory as an integral tool in managing the product lifecycle. The promise of Industry 4.0 is that product realization is supported by intelligent devices distributed throughout the manufacturing environment. Presentations and discussions highlighted the presence of the digital thread and digital twin, which provide additional opportunities in the field of tolerancing and metrology.



Due to the ongoing health risks surrounding COVID-19 and travel restrictions in some countries, the CIRP CAT conference was a hybrid conference that ran fully in-person and fully virtually. The CIRP CAT conference ran as a full, in-person, traditional conference, with 30-minute long oral presentations including discussions. All events (including opening and closing ceremonies, keynotes and scientific presentations) were streamed live via the TEAMS platform.

69 participants from 11 countries attended the conference. The conference received 55 paper submissions. A total of 37 papers were presented in 14 sessions.





The conference featured four keynote presentations from:

- Dr. Marc Wawerla (ZEISS Industrial Quality Solutions Strategic Business Unit of the ZEISS Group), “Algorithms and software for sustainable production”
- Dr. Thierry Yalamas (Phimeca Engineering), ‘Partial overview of industrial issues requiring good modeling of uncertainties”
- Prof. Kristina Wärmefjord (Chalmers University of Technology), “Digital twins for geometry assurance – recent advances and future challenges”
- Prof. Enrico Savio (University of Padua), “Economic benefits of metrology in industrial digital manufacturing”



## 5<sup>th</sup> CIRP Conference on Biomanufacturing (June 2022, Italy)

The 5<sup>th</sup> CIRP Conference on Biomanufacturing (CIRP-BioM 2022) came to a successful close in Calabria, after taking place during June 22-24. The Conference was co-organized by the University of Brescia and the University of Calabria. The conference co-chairs were Prof. Elisabetta Ceretti of the Technology and Production Systems of the Mechanical and Industrial Engineering Department of the University of Brescia, and Prof. Luigino Filice of the Technology and Production Systems of the Mechanical, Energy and Management Engineering Department of the University of Calabria.

CIRP-BioM is designed to be an international forum to discuss progress and directions in biomanufacturing, and to promote the exchange of information on bio-inspired design, biofabrication, and bio-mechatronics. The conference included plenary speeches, oral presentations, and a workshop involving around 90 fellow delegates from 19 different countries, including Italy, Germany, France, India, China, Japan, USA, Mexico, Ecuador, and South Africa.

The opening ceremony of the conference was held at the Popilia Country Resort on June 22nd. Profs. Ceretti and Filice introduced their Universities, the CIRP organization, and scope of the BioM conference.

For the keynote speeches, three distinguished researchers were invited, with focus on the key topics and future development trends in the field of biomanufacturing.



The keynotes were presented during the plenary session at the beginning of each conference day. The keynote speakers were, for the opening session Prof. Bart Verkerke from Twente University, for starting the second day Dr.-Ing. Sebastian Schneider from DECKEL MAHO Pfronten GmbH, and starting the third day Prof. Gerardo Catapano from the University of Calabria.

More than 60 oral presentations were organized in two parallel sessions, which showcased the latest research developments.



The conference also featured a workshop with the presence of the sponsor companies and the oral presentations of the overseas attendees.

The papers were published by PROCEdia and are available on-line at the address: <https://www.sciencedirect.com/journal/procedia-cirp/vol/110>.



## 55<sup>th</sup> CIRP Conference on Manufacturing Systems (CMS, June-July 2022, Switzerland)

The 55<sup>th</sup> Conference on Manufacturing Systems has been organized by the Department of Innovative Technologies of the University of Applied Sciences and Arts of Southern Switzerland. The three days spent in Lugano represented a very fruitful and highly interesting exchange opportunity to discuss the challenges relating to Leading Manufacturing Systems Transformation, involving scientists and industrial partners coming from 26 different countries. During the conference, three valuable key note lectures from academic and industrial representatives were delivered and 265 scientific contributions were presented and discussed over 45 sessions, addressing 19 scientific topics.



The paper “Online parameterization of a milling force model using an intelligent system architecture and Bayesian optimization”, presented by Mr. Benedikt Schmucker, received the Best Paper Award. The award recognizes a young researcher (under 35) who is the lead author of the selected paper and who presented it during the conference. Out of 75 submitted papers, the top 10 were selected by the International Program Committee (33 experts). The best paper was identified among the top 10 papers by the Best Paper Award Selection Committee.

During the conference, networking and social events have been highly appreciated and valorized by all the participants for knowledge exchange, and to create the basis for future scientific collaborations within our CIRP academy.

Some key figures regarding the conference:

- 400 Submissions
- 334 Participants
- 265 Conference papers presented

- 3 Keynote speakers
- 19 topics
- 45 sessions

The success of the CMS 2022 has been possible thanks to the strong commitment of the scientific, organizing, and best paper award selection committee members, and the valuable support of Swiss and international sponsors, to whom we express our sincere gratitude.

Prof. Dr. E. Carpanzano  
Chairman of CMS 2022

Prof. Dr. C.R. Boer  
Co-chair of CMS 2022

Prof. Dr. A. Valente  
Co-chair of CMS 2022

# 16<sup>th</sup> CIRP Conference on Intelligent Computation in Manufacturing Engineering (ICME, July 2022, Italy)

The 16<sup>th</sup> CIRP Conference on Intelligent Computation in Manufacturing Engineering (CIRP ICME '22), held during 13-15 July 2022 in Italy, was successfully run as an Internet-based virtual conference, and has provided a stimulating and valuable experience to its participants. There have been over 2000 views and over 300 comments to KN (keynote), Symposium and Technical Sessions paper presentations, representing a truly positive result for the Virtual Conference.



## Opening and Greetings by the Chairman

Prof. Roberto Teti<sup>a,b</sup>

<sup>a</sup>Fraunhofer Joint Laboratory of Excellence on Advanced Production Technology (Fh J\_LEAPT UniNaples), Italy

<sup>b</sup>Dept. of Chemical, Materials and Industrial Production Engineering, University of Naples Federico II, Italy

The response to the 16<sup>th</sup> edition of the CIRP ICME Conference in terms of number of submitted papers and their quality has confirmed the widespread interest in Intelligent Computation in Manufacturing Engineering, evidencing the increasing trend of the development and implementation of Artificial Intelligence tools and paradigms, covering the whole of production engineering research. The CIRP ICME '22 Virtual Conference has attracted more than 200 delegates with 1 Keynote presentation in the Plenary Session and 193 Symposium and Technical Session presentations by authors from 20 countries and 4 continents.

The topics covered ranged from manufacturing engineering applications of artificial intelligence (AI), including machine learning, deep learning and further intelligent computing paradigms, to manufacturing systems issues (system modeling, design, planning and control, supply networks, machine tools and special machines, assembly systems, battery production, human-robot collaboration, maintenance systems), to product related matters (product life cycle, design, and service), to manufacturing technology aspects (cutting technologies, grinding and abrasive machining, forming, welding, additive manufacturing, composite materials technology, quality assurance, metrology, testing), and to emerging topics, such as smart production, ecosystems, biological transformation, sustainability, machine learning and deep learning, energy efficiency, intelligent and digital factory, virtual and augmented reality, cyber-physical systems, digital twins, cloud manufacturing, and human factors.



## Emergent Synthesis, Value Creation Models and Towards Service Design

Nariaki NISHINO

Department of Technology Management for Innovation,  
School of Engineering, The University of Tokyo

Furthermore, a Special Symposium on IWES 2022 was organized, in collaboration with Prof. Nariaki Nishino, Japan, within the CIRP ICME '22 Virtual Conference relating to the International Workshop on Emergent Synthesis (IWES), in honor of its founder Prof. Kanji Ueda, Past President of CIRP.

Through this wide range of research topics, CIRP ICME '22 aimed at providing an international forum for the exchange of up-to-date knowledge, information, experience, results; as well as the review of progress, discussions on the state of the art, and future trends of AI applications in the various areas and sectors of advanced manufacturing technology and systems.

Deep appreciation is due to the people and organizations which contributed to the realization and success of the CIRP ICME '22 Virtual Conference: Prof. Nariaki Nishino, Japan, for his Keynote presentation and for organizing and chairing the IWES Symposium; the members of the Organizing Committee: Prof. Doriana D'Addona, Dr. Tiziana Segreto, Dr. Alessandra Caggiano and Dr. Alessandro Simeone for their hard work; and all the presenting authors for their valuable contributions.

Particular recognition is due to the International Academy for Production Engineering (CIRP), the main scientific sponsor of the ICME conference series; the University of Naples Federico II for its strong organizational support, and the co-sponsor of the event, the Fraunhofer Joint Laboratory of Excellence on Advanced Manufacturing Technology (Fh-J\_LEAPT UniNaples) participating with representatives from Germany and Italy.



## Digital Twins for Predictive Maintenance

T. Harries, M. Hartnoll, M. Hafezianrazavi, H. Meek, A. Nassehi

University of Bristol, UK

# Future CIRP Conferences and Sponsored 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](#)

You can find all CIRP Conferences and Sponsored Conferences **past events** through the link EVENTS → [CIRP Past Events](#)



# From the CIRP Office



**Chantal Timar-Schubert**

CIRP Annals' submissions & publications process, CIRP meetings, guests, CIRP website, candidatures for membership, Internal Regulations and any other internal matters.



**Agnès Chelet**

Financial aspects: accountancy, membership fees, conferences sponsorships' fees & reports, Winter meetings' registrations. Agendas & minutes of the scientific meetings.

## News

- We kindly remind CIRP Fellows, Honorary and Emeritus, that they can propose candidates for Fellow or Associate membership up to December 1st 2022 (Nominations Forms available online through your Dashboard).
- We remind here under the modifications to the Internal Regulations voted during last General Meeting in Bilbao:

Appendix 6.2.2. From CIRP Annals 2024 onwards, for Vol. 2 Keynote papers, a CIRP CreDiT statement will have to be included for the paper authorship. It will be the responsibility of the lead author and the involved STC(s) to develop the CreDiT statement. The CreDiT statement will have to be first filled in during the approval, and then subsequently updated whenever there is a change in authorship of the paper during the keynote preparation. Only the final version of the CreDiT statement will have to be uploaded together with the Keynote paper submission.

Article 6.2. Each candidate for Associate Membership must have been the first author of at least two papers published in Volume 1 of the "CIRP Annals - Manufacturing Technology" and made individually full presentations of these papers at a General Assembly within the previous six years, including one paper within the last three years.

- All information for the next [2023 Winter Meetings](#), held in Paris in-person only, is provided online on our Website.

## **Future CIRP Meetings**

- Dates of the [future CIRP Winter Meetings](#) 2023 – 2026
- Dates of the [future CIRP General Assemblies](#) 2023 - 2026