

## Final Program

### November 13, 2023

- 12.00 - 13.00      **Registration and Snacks**
- 13.00 - 13.30      **Opening**  
*Andreas Noss*  
CFO Center for Mechatronics and Automation Technology (ZeMA gGmbH)  
*Dirk Bähre*  
CEO Center for Mechatronics and Automation Technology (ZeMA gGmbH),  
Head of Institute of Production Engineering, Saarland University
- Session 1 – Fundamentals and Material**  
*Chairman: Prof. Andreas Schubert*
- 13.30 - 13.50      Influence of contact impedance by using ECM  
*Herzig, Mathias<sup>a</sup>; Schulze, H.-P.<sup>a</sup>; Boetger-Hiller, Falko<sup>b</sup>; Kroening, Oliver<sup>a</sup>.*  
<sup>a</sup>Leukhardt                      Schaltanlagen                      Systemtechnik                      GmbH,  
Gustav-Ricker-Straße                      62,                      39120                      Magdeburg,                      Deutschland  
<sup>b</sup>AMtopus                      GmbH                      &                      Co.                      KG,                      Technologie-Campus                      1,  
09126 Chemnitz, Deutschland
- 13.50 - 14.10      Pulse electrochemical machining of amorphous and crystalline states of  
the bulk metallic glass AMZ4  
*Frank, Alexander<sup>a</sup>; Hall, Thomas<sup>a,b</sup>; Adam, Bastian<sup>c</sup>; Busch, Ralf<sup>c</sup>; Bähre,  
Dirk<sup>a,b</sup>.*  
<sup>a</sup>Institute of Production Engineering, Saarland University, Campus A4 2, 66123 Saarbrücken,  
Germany  
<sup>b</sup>Center for Mechatronics and Automation Technology (ZeMA gGmbH),  
Gewerbepark Eschberger Weg 46 Gebäude 9, 66121 Saarbrücken, Germany  
<sup>c</sup>Chair of Metallic Materials (LMW), Saarland University, Campus C6.3, 66123 Saarbrücken,  
Germany
- 14.10 - 14.30      Investigation of Different Electrolytes in Electrochemical Machining of  
Copper  
*Jakob, Leonie; Rieck, Lasse; Bartsch, Jonas.*  
Fraunhofer Institute for Solar Energy Systems ISE, Heidenhofstraße 2, 79110 Freiburg, Germany.
- 14.30 - 14.50      The Effect of Plasma Electrolytic Polishing on Surface characteristics of Ti-  
6Al-4V alloy  
*Kumar, Sushil<sup>a</sup>; Chandrapakash, C.<sup>a</sup>; Ramkumar, J.<sup>b</sup>*  
<sup>a</sup>Department of Mechanical Engineering, Indian Institute of Technology Kanpur, Kanpur, UP,  
208016, India  
<sup>b</sup>Department of Design, Indian Institute of Technology Kanpur, Kanpur, UP, 208016, India

15.00 - 15.30

**Coffee break**

**Session 2 – Processing I**

*Chairman: Prof. Matthias Hackert-Oschätzchen*

15.30 - 15.50

Electrolyte Jet Machining using a non-aqueous electrolyte to process Ti and its associated surface problems

*Shamraze, Ahmed<sup>a</sup>; Speidel, Alistair<sup>b</sup>; Clare, Adam T.<sup>a,b</sup>*

<sup>a</sup>*Advanced Component Engineering Laboratory (ACEL), Faculty of Engineering, University of Nottingham, Nottingham NG7 2RD, UK*

<sup>b</sup>*Department of Mechanical Engineering, University of British Columbia, Vancouver Campus, 6250 Applied Science Lane, Vancouver, Canada*

15.50 - 16.10

Analysis of bubble evolution in a channel flow with moving walls: an experimental analogy to precise electrochemical machining (PECM)

*Tchoupe Sambou, Elio<sup>a</sup>; Herrig, Tim<sup>a</sup>; Klink, Andreas<sup>a</sup>; Lauwers, Daniel<sup>b</sup>; Meinke, Matthias<sup>b</sup>; Schröder Wolfgang<sup>b</sup>.*

<sup>a</sup>*Laboratory for Machine Tools and Production Engineering WZL of RWTH Aachen University, Campus-Boulevard 30, Aachen 52074, Germany*

<sup>b</sup>*Chair of Fluid Mechanics and Institute of Aerodynamics (AIA), RWTH Aachen University, Wüllnerstr. 5a, 52062 Aachen, Germany*

16.10 - 16.30

Influence of the type of flushing on the recording of material characteristics in electrochemical machining

*Zeiner, Matthias<sup>a,b</sup>; Hall, Thomas<sup>a,b</sup>; Schnur, Jennifer<sup>a</sup>; Bähre, Dirk<sup>a,b</sup>.*

<sup>a</sup>*Institute of Production Engineering, Saarland University, Campus A4 2, 66123 Saarbrücken, Germany*

<sup>b</sup>*Center for Mechatronics and Automation Technology (ZeMA gGmbH), Gewerbepark Eschberger Weg 46 Gebäude 9, 66121 Saarbrücken, Germany*

17.00 – 17.30

**Transfer to Saarbrücken City**

17.30 – 18.30

**Sightseeing Saarbrücken City**

19.00 – 22.00

**Conference Dinner at “Ratskeller” Saarbrücken**

## November 14, 2023

08.30 - 09.00 **Coffee**

### **Session 3 – Application**

*Chairman: Dr.-ir. Krishna Saxena*

09.00 - 09.20 Investigations on the surface texture after pulsed electrochemical machining (PECM) of the magnetic shape memory alloy NiMnGa  
*Bötcher, Falko<sup>a</sup>; Schneider, Jörg<sup>a</sup>; Ul Husnain, Riszwan<sup>b</sup>; Edelmann, Jan<sup>a</sup>*  
*<sup>a</sup>Fraunhofer IWU, Institute for Machine Tools and Forming Technology, Reichenhainer Straße 88, 09126 Chemnitz, Germany*  
*<sup>b</sup>Chemnitz University of Technology Reichenhainer Straße 70, 09126 Chemnitz, Germany*

09.20 - 09.40 Accuracy of pulsed electrochemical machining of NdFeB rotor magnets  
*Martin, Andre<sup>a</sup>; Berger, Thomas<sup>a</sup>; Loebel, Sascha<sup>a</sup>; Schulze, Robin<sup>b</sup>; Thielecke, Alexander<sup>c</sup>; Hackert-Oschätzchen, Matthias<sup>c</sup>; Schubert, Andreas<sup>a</sup>.*

*<sup>a</sup>Professorship Micromanufacturing Technology, Faculty of Mechanical Engineering, Chemnitz University of Technology, 09126 Chemnitz, Germany*

*<sup>b</sup>SITEC Industrietechnologie GmbH, 09114 Chemnitz, Germany*

*<sup>c</sup>Chair of Manufacturing Technology with Focus Machining, Faculty of Mechanical Engineering, Otto von Guericke University Magdeburg, 39106 Magdeburg, Germany*

09.40 - 10.00 Plasma electrolytic polishing of additively manufactured bulk metallic glasses Cu Ti Zr Ni Sn  
*Navickaite, Kristina<sup>a,b</sup>; Nestler, Klaus<sup>a</sup>; Wegner, Jan<sup>c</sup>; Kleszcynski, Stefan<sup>c,d</sup>; Böttger-Hiller, Falko<sup>a</sup>; Penzel, Michael<sup>a,b</sup>; Zeidler, Henning<sup>a,b</sup>.*

*<sup>a</sup>Beckmann Institute for Technology Development e.V., Annaberger Str. 73, 09111 Chemnitz, Germany*

*<sup>b</sup>Technical University Bergakademie Freiberg, Institute of Machine Elements, Engineering Design and Manufacturing, Chair for Additive Manufacturing, Agricolastrasse 1, 09599 Freiberg, Germany*

*<sup>c</sup>University of Duisburg-Essen, Faculty of Engineering, Chair of Manufacturing Technology, Lotharstraße 1, D – 47057 Duisburg, Germany*

*<sup>d</sup>Center for Nanointegration Duisburg- Essen (CENIDE), Carl-Benz-Str. 199, Duisburg, 47057, Germany*

10.10 - 10.40 **Coffee break**

### **Session 4 – New Methods/Hybrid Processes**

*Chairman: Prof. Henning Zeidler*

10.40 - 11.00 Influence of green laser assistance in improving passive layer penetration and surface quality during ECM

*Arshad, Muhammad<sup>a,b</sup>; Saxena, Krishna<sup>a,b</sup>; Reynaerts, Dominiek<sup>a,b</sup>.*

*<sup>a</sup>Micro -& Precision Engineering Group, Division Manufacturing Processes and Systems (MaPS), Department of Mechanical Engineering, KU Leuven, Belgium*

*<sup>b</sup>Member Flanders Make, Belgium*



- 11.00 - 11.20 Development of a suitable electrolyte and voltage for plasma electrolytic rounding of cutting edges on cemented carbide tools  
*Quitze, Susanne<sup>a</sup>; Martin, Andre<sup>a</sup>; Eberhardt, Kevin<sup>b</sup>; Schubert, Andreas<sup>a</sup>.*  
<sup>a</sup>Chemnitz University of Technology, Professorship Micromanufacturing Technology, Reichenhainer Str. 70, 09126 Chemnitz, Germany  
<sup>b</sup>Eberhardt GmbH, Eichendorffstr.5, 91586 Lichtenau, Germany
- 11.20 - 11.40 Experimental and numerical analysis of nano finished tool based electrochemical polishing of additively manufactured metallic part  
*Dadi, Sri Satya Omkar<sup>a</sup>; Patel, Divyansh<sup>b</sup>; Garg, Girish Kant<sup>a</sup>.*  
<sup>a</sup>Department of Mechanical Engineering, Birla Institute of Technology and Science Pilani, Pilani-333031, Rajasthan, India  
<sup>b</sup>School of Mechanical Sciences, Indian Institute of Technology, Bhubaneswar, Bhubaneswar-752050, India
- 11.50 - 12.50 **Lunch**
- Session 5 – Simulation and Modeling/Processing II**  
*Chairman: Prof. Dirk Bähre*
- 12.50 - 13.10 Effect of pulse parameters on gas bubble evolution during ECM process: experiments using high speed videographic observations  
*Saxena, Krishna<sup>a,b</sup>; Arshad, Muhammad<sup>a,b</sup>; Reynaerts, Dominiek<sup>a</sup>; Kunieda, Masanori<sup>b</sup>*  
<sup>a</sup>Micro -& Precision Engineering Group, Division Manufacturing Processes and Systems (MaPS), Department of Mechanical Engineering, KU Leuven, Belgium  
<sup>b</sup>Department of Precision Engineering, University of Tokyo, Bunkyo City, Tokyo, Japan
- 13.10 - 13.30 Optical in situ analysis of gas evolution in the transient working gap in precise electrochemical machining (PECM) using high-speed recordings  
*Klink, Andreas<sup>a</sup>; Tchoupe Sambou, Elio<sup>a</sup>; Herrig, Tim<sup>a</sup>; Lauwers, Daniel<sup>b</sup>; Meinke, Matthias<sup>b</sup>; Schröder Wolfgang<sup>b</sup>.*  
<sup>a</sup>Laboratory for Machine Tools and Production Engineering WZL of RWTH Aachen University, Campus-Boulevard 30, Aachen 52074, Germany  
<sup>b</sup>Chair of Fluid Mechanics and Institute of Aerodynamics (AIA), RWTH Aachen University, Wüllnerstr. 5a, 52062 Aachen, Germany
- 13.30 - 13.35 **Announcement INSECT 2024**
- 13.35 - 13.40 **Closing Remarks INSECT 2023**
- 14.00 – 15.15 **Shop floor visit ZeMA**