

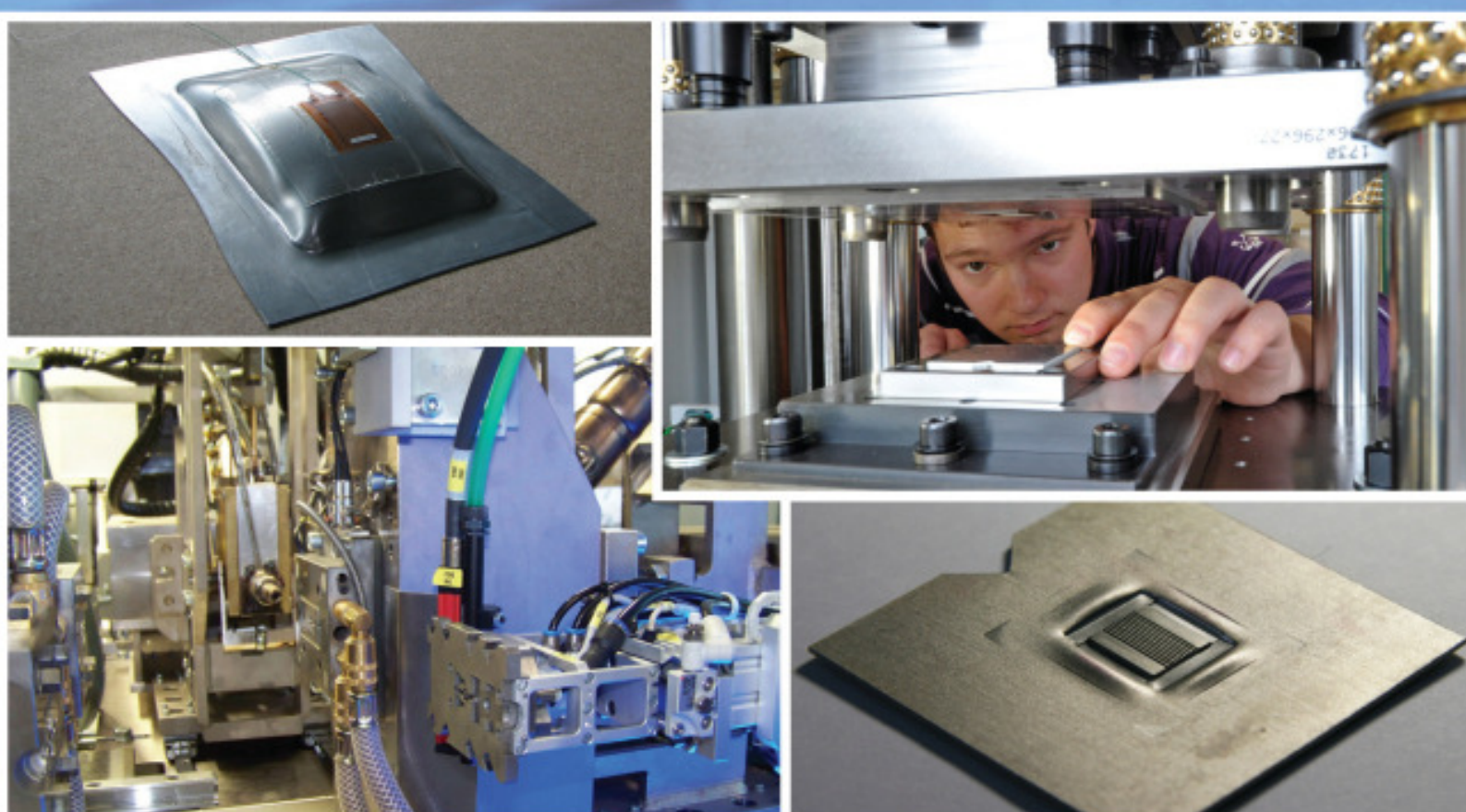
CRC/Transregio 39

„High-Volume Production-Compatible Production Technologies for Lightmetal and Fiber Composite-Based Components with Integrated Piezo Sensores and Actuators (PT-PIESA)“

3rd Scientific Symposium

„Integration of Active Functions into Structural Components“

October 12 - 13, 2011



Final Program

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It is a great pleasure to welcome you to the Third Scientific Symposium of the Collaborative Research Center/Transregio 39 - „PT-PIESA“, which has been funded by the German Research Foundation (DFG) since 2006.

Chemnitz and Dresden University of Technology, the University of Erlangen-Nuremberg, the Fraunhofer Institute for Machine Tools and Forming Technology Chemnitz/Dresden, the Fraunhofer Institute for Ceramic Technologies and Systems Dresden as well as the Bavarian Laser Center Erlangen are Project partners.

Scientists of „PT-PIESA“ and international experts in science and production will focus on the topic „Integration of Active Functions into Structural Components“. The

discussion won't be directed only on the field of component design, but also on production technology. Different approaches will be compared and evaluated.

This conference will incorporate key aspects of design and structuring of process chains for active structural components based on sheet metal forming, light metal pressure die casting and fibre composites. Also aspects of component testing and quality control of the integrated piezo sensors and actuators will be addressed.

I'm very pleased to be able to welcome you in Chemnitz at the Fraunhofer Institute of Machine Tools and Forming Technology IWU.

A handwritten signature in black ink, appearing to read 'R. Neugebauer'.

Prof. Dr.-Ing. habil. Prof. E.h. Dr.-Ing. E.h. Dr. h. c.
Reimund Neugebauer
Spokesman of the CRC/TR 39

Program on October 12, 2011

Chair: Prof. R. Neugebauer

- 10:00 **Welcome**
Prof. R. Neugebauer, Spokesman of the CRC/TR 39
- 10:15 **Keynote**
Smart structures based on piezoceramics
H. Irschik (Institute for Technical Mechanics, Johannes Kepler University Linz, Linz, Austria) et al.
- 10:45 **Keynote**
Contacting of multilayer piezoactuator for diesel common rail injectors
A. Lenk, C. Zumstrull (Continental Automotive GmbH, Limbach-Oberfrohna, Germany)
- 11:15 **Keynote**
Integrated piezoceramic patches in advanced composite structural elements: effective coupling and characteristics
A. Benjeddou (Institut Supérieur de Mécanique de Paris, France)
- 11:45 **Keynote**
Future perspectives for multi-material-systems
M. Schneebauer, M. Würtele (KraussMaffei Technologies GmbH, Munich, Germany)
- 12:15 **Lunch Break / Exhibition**

- 13:15 **Fabrication and characterization of a form- and force-locked piezo-metal sensor module**
M. Müller (Institute for Machine Tools and Production Processes, Chemnitz University of Technology, Chemnitz, Germany) et al.
- 13:45 **CNT-filled PP compound for in-situ bonding and connection of piezoelectric ceramics by using multi-component micro injection molding**
M. Heinrich (Department of Lightweight Structures and Polymer Technology, Chemnitz University of Technology, Chemnitz, Germany) et al.
- 14:15 **Design and characterization of LTCC/PZT multilayers for sensor and actuator application**
S. Gebhardt (Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany) et al.
- 14:45 **Coffee Break / Exhibition**
- 15:15 **Keynote**
Multifunctional components in vehicle space frames - Cast parts for prototypes and small series
Z. Khalil, R. Kretz, P. Simon (AIT Austrian Institute of Technology, Light Metals Technologies Ranshofen, Austria)
- 15:45 **Energy harvesting by means of integrated piezoelectrics**
J. Juuti (Microelectronics and Materials Physics Lab, University of Oulu, Oulu, Finland) et al.
- 16:15 **Integration of piezoceramic sensors and actuators into structural components via high pressure die casting**
A. Klassen (Chair of Metals Science and Technology, Friedrich-Alexander Universität Erlangen-Nürnberg, Erlangen, Germany) et al.
- 16:45 **Piezo-metal-composites in structural parts: Technological design, process simulation and material modelling**
S. Hensel (Fraunhofer Institute for Machine Tools and Forming Technology IWU, Chemnitz, Germany) et al.
- 17:15 **Closing First Day**
- 18:45 **Evening Event**
Chemnitz Museum of Industry



- 09:00 **Keynote**
Fiber reinforced polymers in automotive applications -
G. H. Deinzer, C. Haverkamp (Audi AG Neckarsulm, Neckarsulm, Germany)
- 09:30 **Keynote**
Potentials and general conditions of smart CFRP concepts for future aerospace applications
A. Knorr (EADS - Elbe Flugzeugwerke GmbH, Dresden, Germany)
- 10:00 **Process development for high volume manufacture of thermoplastic composites with integrated piezoceramic modules**
T. Heber (Institute of Lightweight Engineering and Polymer Technology ILK, Technische Universität Dresden, Dresden, Germany) et al.
- 10:30 **Integration of piezoceramic and electronic functional elements in glass fibre-reinforced polyurethane composite structures**
S. Geller (Institute of Lightweight Engineering and Polymer Technology ILK, Technische Universität Dresden, Dresden, Germany) et al.
- 11:00 **Coffee Break**
- 11:30 **Keynote**
Modeling of the ferroelectric material behavior of functional ceramics
M. Kuna (Institute for Mechanics and Fluid Dynamics, TU Bergakademie Freiberg, Freiberg, Germany)
- 12:00 **Methods for reliable modeling of piezoceramic materials**
S. J. Rupitsch (Chair of Sensor Technology, Friedrich-Alexander Universität Erlangen-Nürnberg, Erlangen, Germany) et al.
- 12:30 **Pyroelectric response as a sensitive tool for the characterization of piezoelectrics**
A. Movchikova (Dep. of Ferroelectric and Piezoelectric Physics, Tver State University, Tver, Russian Federation) et al.
- 13:00 **Lunch Break**
- 14:00 **Pulsed magnetron sputtered AlN thin films - a lead-free material for piezoelectric applications**
D. Glöß (Fraunhofer Institute for Electron Beam and Plasma Technology FEP, Dresden, Germany) et al.
- 14:30 **Evaluation of the polarization state of embedded piezoelectrics using thermal waves**
G. Suchanek, W. Hu, G. Gerlach (Solid-State Electronics Lab, Technische Universität Dresden, Dresden, Germany)
- 15:00 **Novel approaches for the determination of the process specific polarization of piezoceramic modules embedded in thermoplastic composites**
B. W. Brückner (Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany) et al.