

# Ultra-Precision High Performance Cutting

**Chair: Dr.-Ing. Lars Schönemann, Leibniz-Institute for Materials Engineering IWT, Germany**

The Research Group "Ultra-Precision High Performance Cutting" (UP-HPC) is a collaboration between the University of Bremen and the Leibniz University Hannover funded by the German Research Foundation (DFG). Participating research institutes are the Laboratory for Precision Machining (LFM, Professor Ekkard Brinksmeier) from Bremen, the Bremen Institute for Mechanical Engineering (bime, Professor Bernd Kuhfuß) as well as the Institute of Production Engineering and Machine Tools (IFW, Professor Berend Denkena) from Hannover.

The goal of this research group is it to reduce the disproportionally long primary and secondary processing times in ultra-precision machining via scientific means, in order to leverage the economic applicability of this technology in the manufacturing industry.

After two funding periods and six years of research in total, the UP-HPC research unit officially comes to an end in 2020 with a final colloquium and workshop held at the euspen international conference and exhibition in Geneva, Switzerland. The colloquium will give a brief overview on the major outcomes of the five sub-projects of the research unit and is accompanied by invited talks from industrial partners.

## **14:00 – 14:20 Opening address and overview on research unit**

Prof. Dr.-Ing. habil. Prof. h.c. Dr.-Ing. E.h. E. Brinksmeier and Dr.-Ing. L. Schönemann  
*Leibniz Institute for Materials Engineering IWT, Bremen*

## **14:20 – 14:40 Invited talk: Dynamic characterization of an ultra-precision high speed spindle**

Dr. B. Knapp  
*Professional Instruments Company, USA*

## **14:40 – 15:00 Ultra-precision high speed cutting of ductile and brittle materials**

Daniel Berger  
*Leibniz IWT, Bremen, Germany*

## **15:00 – 15:30 Balancing of high speed air bearing spindles**

Timo Dörgeloh (IWT) and Nasrin Parsa (bime)  
*Leibniz IWT, Bremen and Bremen Institute for Mechanical Engineering bime, Germany*

## **15:30 – 15:45 Coffee break**

## **15:45 – 16:05 Accelerated feed rates by electromagnetic levitation guides**

Rudolf Krüger  
*Institute for Production Engineering and Machine Tools IFW, Leibniz University Hannover, Germany*

## **16:05 – 16:35 Model-based controls for ultra-precision machining**

Per Schreiber (IFW) and Johannes Hochbein (bime)  
*IFW Hannover and bime Bremen, Germany*

**16:35 – 16:55 Invited talk: The Advantage of Magnetic Levitation Stages in Cutting- and Inspection Systems**

Dr. R. Glöß

*Physik Instrumente (PI) GmbH, Germany*

**16:55 – 17:15 Ultra-precision milling with multiple cutting edges**

Dr.-Ing. L. Schönemann

*Leibniz IWT, Bremen, Germany*

**17:15 – 17:30 Final remarks and closure**

Dr.-Ing. O. Riemer

*Leibniz IWT, Bremen, Germany*