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Press release

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Process Engineering: World renowned Scientist joins the team of Collaborative Research Centre SMART Reactors

One of the world's leading researchers in the field of fundamental and applied chemical thermodynamics will be joining the Collaborative Research Centre SMART Reactors (CRC) at Hamburg University of Technology: Professor Walter G. Chapman is no stranger to the Institute of Thermal Process Engineering. The chemical engineer has been a permanent visiting professor there since 2019.

In the future, Chapman will be available to the CRC as part of the Mercator Fellowship module - including as a co-supervisor for the doctoral students in the project "Experimentally supported modelling of local process conditions with self-adapted components". Mercator Fellows serve as important sources of inspiration and help to develop ideas for solving key societal challenges. "We are very proud to welcome such an outstanding scientist with a global reputation to work at our Collaborative Research Centre," says Professor Irina Smirnova, Head of the Institute of Thermal Process Engineering and Vice President for Research.

The collaboration was inspired by the fact that Chapman received a Humboldt Research Award from the German Alexander von Humboldt Foundation in 2019, an award that recognizes research achievements and encourages foreign scientists to work at research institutions in Germany. As part of the activities of this research award, Prof Chapman has already been specifically involved in the preparations for the SFB. Chapman, who has been appointed a permanent visiting professor at Hamburg University of Technology, will also act as co-supervisor for doctoral students at the university.

"Developing these reactor systems for specific applications will be incredibly powerful, both in biochemical and chemical systems," Chapman said. "This could change the way certain chemicals are made and make it possible to do it locally, relatively cheaply and in a more sustainable way."

Switching processes to renewable raw materials

The SMART Reactors CRC aims to find solutions for switching economic and production chains from fossil to sustainable and renewable raw materials. However, these can fluctuate seasonally and geologically in their availability and quality. There is therefore an urgent need for processes and reactors that can react flexibly to fluctuating raw material properties. A very high degree of process control is required to enable such an adaptation: pressures, temperatures, concentrations as well as substances and liquids must be monitored in the reactors using suitable sensors. In the coming years, the CRC team would like to develop new multi-purpose reactors that can convert sustainable renewable resources into various products in a more sustainable way.

Explaining thermodynamic models

Chapman's home university is Rice University, one of the leading private US universities based in Houston, Texas. There he works as Professor of Chemical and Biomolecular Engineering, Director of the Energy and Environmental Systems Institute and Associate Dean for Energy Research. The Humboldt Research Award winner is a dedicated researcher and teacher who has been honoured with numerous international teaching awards. The Humboldt Award honours scientists for their overall achievements to date, whose fundamental discoveries, insights or new theories have had a lasting impact on their own specialist field. The US researcher's significant contributions include thermodynamic models for the



phase behaviour of complex liquids and interfacial properties that are relevant to both industry and science.

Further information: https://www.tuhh.de/sfb1615/welcome



Prof Walter G. Chapman is a permanent visiting professor at TU Hamburg and Chair of Chemical and Biomolecular Engineering at Rice University Houston, USA Jeff Fitlow/Rice University