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In Celebration

Celebration of Professor Bernhard Weigand on his 60th birthday



Our colleague, teacher and friend, Professor Bernhard Weigand celebrates his 60th birthday this year. It gives us immense pleasure to take this opportunity to warmly applaud him for all his achievements, and to express our sincere appreciation for his outstanding contributions to the field of heat transfer and multi-phase flows.

Bernhard Weigand is a Professor at the University of Stuttgart, and a member of the German National Academy of Science and Engineering (acatech) and the Heidelberger Akademie der Wissenschaften. Born on January 10, 1962 in Somborn (Hessen), he studied Mechanical Engineering at the TH Darmstadt (now TU Darmstadt) from 1981 to 1987, from where he graduated as Dipl.-Ing.. From 1987 to 1992, he worked as a research assistant at the same university while conducting his doctoral research. His scientific supervisor was Professor Hans Beer, who in turn was a student of Professor Fran Bošnjaković. From 1992 to 1999, he worked at ABB Kraftwerke AG in Baden, Switzerland, as development engineer and eventually became in charge of fundamental research into heat transfer, and the design of cooling technologies for all new gas turbine blades. In parallel with his full-time employment at ABB, he successfully completed his habilitation in February 1997. On April 1, 1999, he was appointed as Full Professor at the University of Stuttgart, and as Director of the Institute of Aerospace Thermodynamics (ITLR).

Professor Bernhard Weigand is universally acknowledged as the leading scientist in the fields of thermodynamics and heat transfer. His use of experimental, computational and analytical methods to investigate various gas turbine cooling technologies such as swirl cooling, film cooling and transpiration cooling have set the pace of progress in these fields. His contributions in these areas have been particularly significant, most especially because of new physical insight provided in regard to a variety of related physical effects. He was extraordinarily successful in transferring university-based fundamental research to the gas-turbine industrial community. He achieved this through long-standing and productive collaborations with ABB, Siemens AG and MTU Aero Engines AG. In addition to

working on complex heat transfer issues, he contributed to experimental and computational analysis of the physics of droplet interaction, a topic of vital importance to a variety of industrial processes such as spray cooling, droplet evaporation in combustion engines, and droplet-wall interactions with smooth and textured surfaces, with applications, for example, to the design of medical inhalers. Moreover, he has been leading the development of in-house high-fidelity multi-phase solver *FS3D* and contributed to numerical methods for studying droplet evaporation and solidification. His contribution also includes studies on the post-Darcy flow and heat transfer inside additively-manufactured porous media, as well as smart interface engineering with permeable interface.

In addition to his leadership at the University of Stuttgart, Professor Bernhard Weigand plays a leading role as the spokesman of DFG (German Research Foundation)-funded collaborative projects, such as the SFB-TRR 75: “Droplet Dynamic Processes under Extreme Environmental Conditions” and the GRK-2160: “Droplet Interaction Technologies” (DROFIT). In terms of academic output, Professor Bernhard Weigand has published close to 500 articles in leading archival journals and conferences. He has also been very successful in converting the outcome of his research into tangible benefits to the industry, as evidenced by the 45 patents which he has co-authored with his students and collaborators. In addition to his extensive involvement with research activities, Professor Bernhard Weigand has rendered many exemplary services to the field of engineering education. Thus he has been extensively involved with the development of new national and international study and doctoral programs, and has co-authored several textbooks that have become widely-used in undergraduate and graduate programs of study. Among his textbooks it is notable to mention *Convective Heat and Mass Transfer*, a book he co-authored with William Kays and Michael Crawford, that has become one of the most well-known text books of its kind and has been translated into many languages.

Professor Bernhard Weigand’s wide-ranging research interests, based on profound knowledge in many areas of thermodynamics, heat transfer and multi-phase flow, as well as his ability to establish long-lasting and productive collaborations with national and international partners have established him as a highly respected professor throughout the world. Within these cooperative activities, he is adept in providing new insights and innovative perspectives regarding measurement techniques, thermal processes, analytic procedures, and other areas. In addition to his roles as the spokesman of SFB-TRR 75 and the GRK-2160, he is a Principal Investigator and a project network spokesperson in the

Cluster of Excellence 2075 (SimTech), a member of the board of SFB-1313 “Interface-Driven Multi-Field Processes in Porous Media - Flow, Transport and Deformation”, and was a member of the board of SFB-TRR 40 “Technological Foundations for the Design of Thermally and Mechanically Highly Loaded Components of Future Space Transportation Systems”. He was the spokesman of the GRK-1095: “Aerothermodynamic Design of a Scramjet Propulsion System for Future Space Transportation Systems” from 2004 to 2015. He served as the vice-rector of the University of Stuttgart from 2006 to 2009. Professor Bernhard Weigand is also active in international academic visits and communications. For more than twenty years he has been a yearly visiting Professor at the Swiss Federal Institute of Technology in Lausanne (EPFL) and at the University of Bergamo in Italy. This led to very intensive interaction and collaboration in common research. From 2015 to 2020, he had been an Advisory Professor at the Shanghai Jiao Tong University in China.

We take this wonderful occasion and this apt forum of the International Journal of Heat and Mass Transfer to recognize Professor Bernhard Weigand’s outstanding scientific accomplishments, his visionary leadership, and his exemplary academic service to our society. Professor Weigand is an invaluable asset to our community, and we wish him many more productive years to come. On behalf of his colleagues, collaborators, students, and friends from around the world, we wish him good health, happiness and prosperity on his 60th birthday.

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