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Jürgen Sprekels turns sixty

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JÜRGEN SPREKELS TURNS SIXTY

Prof. Dr. Jürgen Sprekels was born in Hamburg on October 21, 1948, and his mathematical career also began there. He received his Ph.D. degree in 1975 under the supervision of Lothar Collatz. Only two years later he finished his habilitation with a thesis on "Iteration schemes for the inclusion of positive solutions to super-linear integral equations and boundary value problems". After a visiting professor position at Oregon State University and a temporary professorship at the Freie Universität Berlin he became Associate Professor in Numerical Mathematics at the Universität Augsburg in 1981, being the first regularly hired member of the newly founded Faculty of Natural Sciences. Seven years later Jürgen took up the chair of Engineering Mathematics at the Universität Essen. In 1994 he was appointed to his current position as Full Professor of Applied Analysis at the Humboldt University (HU) and Director of the Weierstrass Institute for Applied Analysis and Stochastics in Berlin.

Jürgen Sprekels is a true applied mathematician with an extraordinary intuition in translating real world problems into mathematical language. He has initiated a large number of cooperative projects with applied research institutions and industrial partners in materials sciences, e.g., on shape memory alloys, crystal growth modeling, or piezoelectric effects. He never gives up his effort to encourage scien-

tific exchange between mathematicians, physicists, and engineers. He has organized over 40 workshops and symposia on free boundary problems, control theory, and hysteresis that have been much appreciated in the scientific community.

Educated as a numerical analyst, he soon turned to modeling physical processes, qualitative analysis of the underlying partial differential equations, and their optimal control. Among his most favorite topics, continuum mechanics and thermodynamics of phase transitions occupy a prominent place.

Since the eighties, Jürgen has been fascinated by a newly emerging branch of applied mathematics—the theory of hysteresis operators developed by Mark Krasnosel'skii and Alexei Pokrovskii in [2]. He immediately recognized its modeling potential for memory processes in mechanics, electromagnetics, and phase transitions. Common features of hysteresis and phase transitions were pointed out for the first time in a joint monograph [1] with Martin Brokate. A major breakthrough in the mathematics of hysteresis was Jürgen Sprekels's thermodynamic concept of energy exchange between heat and hysteresis potentials in nonequilibrium processes with applications to thermoplasticity and phase transitions, see, e.g., [3], [4], [5].

In recent years, Jürgen has also worked systematically on modeling and optimization of thin elastic and elastoplastic mechanical structures, such as beams, rods, plates, and shells. A large part of the recent joint monograph [6] with Pekka Neittaanmäki and Dan Tiba is devoted to this subject. In addition to the two monographs, he was co-editor of six conference volumes. More than 130 research papers bear testimony to his productivity.

Beside of his scientific merits Jürgen played an important role in shaping the future of the reunified scientific landscape in Berlin. He became the first regular director of the Weierstrass Institute for Applied Analysis and Stochastics (WIAS). It had been founded in 1992 on the basis of parts of the former Karl Weierstrass Institute for Mathematics of the Academy of Sciences of the GDR. Under Jürgen's guidance, WIAS became an internationally recognized brand for an institution in which fundamental research in Applied Mathematics is combined with long-term application oriented projects with partners from industry, engineering, and the natural sciences. The amount of third party funds acquired by the institute tripled from DM 1.3 million in 1994 to more than EUR 2.0 million in 2007, allowing the employment of 29 additional scientists.

Jürgen lead the institute through two external evaluations in 1997 and 2003, both of which turned out to be extremely successful and helped to consolidate its position among the leading institutes in Applied Mathematics. WIAS is a part of Forschungsverbund Berlin e. V. and a member of the Leibniz Association. On the international level, it belongs to the European Research Centres on Mathematics and is a member of the International Mathematical Sciences Institutes (IMSI).

In addition to his duties as director of WIAS and professor at the HU Berlin, Jürgen was also the spokesman of Section D and member of the Board of the Leibniz Association from 1999 to 2005. He was a member of the Organizing Committee and Treasurer of the International Congress of Mathematicians 1998 in Berlin. Presently, he is the spokesman for the Forschungsverbund Berlin, Coordinator of IMSI, and a member of the Board of the Research Center MATHEON. Last but not least, he has been a member of the Editorial Board of this periodical, "Applications of Mathematics", since 2002.

Jürgen has a strong sense of cooperation, always willing to listen to the other's arguments and asking accurate questions. His collaborators appreciate his competence as well as his patience and empathy.

We dedicate this special issue of "Applications of Mathematics" to his sixtieth birthday. The contributions are written by his collaborators and colleagues from his nearest spiritual neighborhood, and cover most of his areas of interest.

For the forthcoming years, we wish our friend and colleague, Jürgen Sprekels, a lot of energy and continuing enthusiasm for all his present and future activities: Nu, Jürgen, wünscht wi Di enen glücklichen un blieden Boortsdag un noch veel Spood in de Tokumst.*

Dietmar Hömberg, Guest Editor,
Pavel Krejčí, Editor

References

[1] *M. Brokate, J. Sprekels*: Hysteresis and Phase Transitions. Applied Mathematical Sciences Vol. 121. Springer, New York, 1996.

[2] *M. A. Krasnosel'skii, A. V. Pokrovskii*: Systems with Hysteresis. Springer, Berlin, 1989; Russian Edition: Nauka, Moscow, 1983.

[3] *P. Krejčí, J. Sprekels*: Temperature-dependent hysteresis in one-dimensional thermo-visco-elastoplasticity. Appl. Math. *43* (1998), 173–205.

[4] *P. Krejčí, J. Sprekels*: A hysteresis approach to phase-field models. Nonlinear Anal., Theory Methods Appl. *39* (2000), 569–586.

[5] *P. Krejčí, J. Sprekels, U. Stefanelli*: Phase-field models with hysteresis in one-dimensional thermoviscoplasticity. SIAM J. Math. Anal. *34* (2002), 409–434.

[6] *P. Neittaanmäki, J. Sprekels, D. Tiba*: Optimization of Elliptic Systems. Theory and Applications. Springer Monographs in Mathematics. Springer, New York, 2006.

* Birthday greetings in Low German (Plattdüütsch), a regional language variety spoken in northern Germany.