



ORIGINAL ARTICLE

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Foreword

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H. Altenbach, aged 33

The particular occasion that motivated the organization of this special issue was the upcoming date for the 65th birthday of Professor Holm Altenbach. Along his exceptional career, Holm Altenbach has been at the forefront of continuum and structural mechanics. In his early days, he was engaged in the theory of shells and plates while he was profoundly influenced by his teacher Pavel Andreevich Zhilin. This strong specialization, which presupposes a profound knowledge of advanced mechanics, was a major impact that strengthened him for all possible fields in continuum mechanics that he is been plowing for the last four decades. The decision to place a special issue in honor of Holm Altenbach in the journal *Continuum Mechanics and Thermodynamics* was hence obvious.

Holm Altenbach embarked on a meteoric career at Leningrad Polytechnic Institute (now Peter the Great St. Petersburg Polytechnic University) in Soviet Union (now Russia). There he completed his studies with a diploma in 1980, a dissertation in 1983, and a habilitation in 1987, all with a major in mechanics. Afterwards,

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he went on to the University of Magdeburg where his scientific career started out a bit bumpy. Obviously in conflict with the higher education system of the German Democratic Republic and the local functionaries, he worked as scientific assistant and lecturer in various divisions. The appointment to a professorship seemed out of reach. As can be seen in the photograph shown above, this obviously could not dampen his mood.¹ This situation changed with the political upheavals of the year 1990. Holm Altenbach henceforth took on several guest lectureships at universities, mostly in former Eastern Bloc countries. During this time, however, he also made first acquaintances with scientists beyond the now fallen Iron Curtain. Then, in 1993 he became *Privatdozent* (similar to assistant professor) and in 1995 *außerplanmäßiger Professor* (similar to associate professor) in Magdeburg. After a position to substitute a professor, Holm Altenbach accepted the call to get a professorship for the cathedra of Engineering Mechanics at the University of Halle-Wittenberg in 1996. He still holds this professorship today. Over these 25 years, there was only one professional change: In 2011, due to political reasons, his chair was moved to the University of Magdeburg.

Holm Altenbach is quite a productive and restless human. On the basis of the list maintained by himself, he has so far published 23 textbooks (including some new editions), 45 edited books, around 300 journal articles, 145 chapters in books, and more than 100 articles in conference proceedings. He also co-founded and co-edited the Springer Series *Advanced Structured Materials*, *SpringerBriefs in Computational Mechanics*, and *SpringerBriefs in Continuum Mechanics*. One of his most recent highlights is the editorial of the *Encyclopedia of Continuum Mechanics* where he (co-)edited several significant entries. Holm Altenbach is furthermore member of the editorial board of several international journals. He additionally serves as editor-in-chief of the prestigious ZAMM (*Zeitschrift für Angewandte Mathematik und Mechanik—Journal for Applied Mathematics and Mechanics*), founded by Richard von Mises in 1921. However, Holm Altenbach does not belong to the species that places the majority of his own publications in journals managed by himself. Rather, he is open to unusual approaches and smart ideas, while being surely an opponent of blind specialization. Besides this editorial work, Holm Altenbach is particularly keen on scientific exchange. He (co-)organized several successful conferences and workshops on shell-like structures, composite structures, creep, failure and damage, cellular and porous materials, and specially generalized continua.

The scientific *oeuvre* of Holm Altenbach shows a broad spectrum. In principle, his work can be assigned to the fields known as *elementary mechanics*, *theoretical mechanics*, and *rational mechanics*. Research areas can be roughly summarized as follows, while a detailed disclosure would go beyond the scope of this foreword:

- theory of plates and shells,
- composite structures,
- material modeling, and
- generalized continua.

Within these four areas, particular attention is paid to topics such as creep, damage, localization and failure mechanisms, stability problems, as well as surface and interphase phenomena. Modern analytical and numerical methods are used to solve these problems. The research areas described here mostly result from problems of industrial applications. For his work, he has received several international awards and honors. For instance, in 2019, he was elected as a Foreign Member of Russian Academy of Sciences, in the Section of Mechanics. This was a natural result of many years of cooperation with Soviet and Russian scientists as well as his significant achievements in the field. Holm Altenbach collaborates with scientists all around the globe. He maintains personal friendships with many of them. Through its busy and unsteady activity, he is well known and considered as original personality in the mechanics community.

In addition to his research in various aspects of continuum mechanics, Holm Altenbach has had a strong influence in shaping the direction that the field has taken in the past few decades through numerous students who have learnt mechanics from him, both at the University of Halle-Wittenberg and at the University of Magdeburg. He also gives his lectures at foreign universities, e.g. Poland, Australia, and Vietnam, to encourage young people for scientific work. Furthermore, Holm Altenbach tried to promote the studies and careers of many students and scientists from all around the globe by offering opportunities for guest residencies in his research group. Many of this students decided to pursue a career in mechanical science after having taken his meticulously prepared courses delivered with pellucid clarity. In the meantime, he has supervised 50 dissertations, 2 habilitations, and to this date, 4 of his students became professors.

We have compiled **58** high-quality contributions. The papers are written by current and past collaborators of Holm Altenbach, which for the most part are prominent researchers in the fields of mechanics, thermodynamics,

¹ We would like to thank Reinhold Kienzler who provided us with this photograph. It was taken during the EUROMECH Colloquium 251 *Applications of Continuum Damage Mechanics* organized by Marcin Chrzanowski in Kraków (Poland) from September 7–9, 1989.

materials modeling, applied mathematics, as well as adjacent areas. They address open questions and present the latest development in these areas. All contributions have undergone full peer review. We would like to thank all reviewers for their valuable comments. It is our hope that the present volume will give the reader an insight into the advancements in continuum mechanics and that it is a fitting tribute to Holm Altenbachs wide ranging contributions to mechanics.

We wish Holm all the best for his 65th birthday, continued creative power, a lot of pleasure in scientific work, and a slow transition into a well-deserved retirement.

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