

FOREWORD TO THE SPECIAL ISSUE
DEDICATED TO THE JUBILEE OF PROFESSOR PAWEŁ ZIĘBA

This Special Issue of Archives of Metallurgy and Materials is dedicated to Professor Paweł Zięba on the occasion of his Jubilee – a celebration of a life devoted to science, to the community of materials scientists, and to the people whose careers he shaped. I write this foreword with a deep sense of gratitude and privilege, as someone who had the honour of being one of his doctoral students, and who counts herself among the many researchers whose scientific path was irreversibly shaped by his guidance.

Professor Paweł Zięba was born in 1956 in Bielsko-Biała and graduated with distinction from the Faculty of Foundry Engineering at AGH University of Science and Technology in Kraków in 1981. His scientific journey took a decisive turn when he joined the Institute of Metallurgy and Materials Science of the Polish Academy of Sciences (IMMS PAS) in 1984, where he has remained throughout his entire career. Under the supervision of Professor Andrzej Pawłowski, he completed his doctoral dissertation on discontinuous dissolution in Al-Zn alloys, defended with distinction in 1987, and his habilitation in 1996, in which he introduced a pioneering local approach to the description of diffusion processes at migrating phase boundaries in discontinuous solid-state reactions – a concept that broke the prevailing global treatment of these phenomena and opened an entirely new way of interpreting mass transport at moving grain boundaries.

The significance of this contribution was confirmed at the highest international level. A 1999 paper summarising his *in-situ* transmission electron microscopy studies of discontinuous precipitation and dissolution in an Al-22 at.% Zn alloy was awarded the Werner Köster Prize – the best paper of the year in *Zeitschrift für Metallkunde* – by the Deutsche Gesellschaft für Materialkunde and Carl-Hanser Verlag. This recognition, alongside two prestigious fellowships of the British Council (Manchester Materials Science Centre, 1991-1992 and 1995) and a two-year Alexander von Humboldt Fellowship at the University of Stuttgart and Max-Planck-Institut für Metallforschung (1997-2003), placed Paweł Zięba firmly among the leading European researchers in diffusion and phase transformations. His professorial monograph *Local Characterization of the Chemistry and Kinetics in Discontinuous Solid State Reactions* (2001) became a reference work in the field, offering a comprehensive account of the mechanism and kinetics of diffusion and grain boundary migration in discontinuous solid-state reactions.

Over the following decades, Professor Paweł Zięba broadened his research to encompass two further areas of great practical importance: diffusion soldering for electronic interconnections, and photovoltaic materials and technologies. In the domain of soldering, he pioneered the investigation of diffusion soldering in systems such as Cu/In/Cu, Cu/In-Sn/Cu, and Ag/Sn/Ag, developing models for the kinetics of intermetallic phase growth that allow the prediction of joint lifetime and thermal stability. It is in this context that I had the honour of pursuing my doctoral research under his supervision, working on diffusion-soldered interconnections – and it is no exaggeration to say that it was Professor Zięba who first awakened my enduring fascination with soldering and interfacial phenomena. His influence on my scientific thinking has been, and continues to be, profound.

Beyond his personal research achievements, Professor Paweł Zięba devoted enormous energy to the development of Polish materials science as an institution. Over the course of his career, Professor Zięba has rendered



extraordinary service to IMMS PAS – serving sixteen years in its leadership, first eight years as Deputy Director for Scientific Affairs under Professor Bogusław Major and then as Director for two consecutive terms, contributing to the shaping of Polish materials science at the highest institutional level. As Director of IMMS PAS for two terms (2011-2019), he oversaw a profound renewal of the Institute's scientific staff and infrastructure, initiated international interdisciplinary doctoral programmes in English, and ensured that the Institute twice received Category A in national research evaluation – placing it among the very best materials science units in Poland and in the top tier internationally. Under his leadership, a new generation of researchers was recruited and mentored; many of them now lead their own groups and have gone on to build independent scientific careers of their own. I was privileged to succeed him as Director of the Institute – a responsibility I approach with the awareness of how much of the foundation I stand on was laid by him.



Photograph taken on the 1st of September 2025 – on the day of the shared joy – submitting the documents for my professor title to the hands of the one who first set me on this path

For nearly fifteen years, Professor Paweł Zięba served as Editor-in-Chief of Archives of Metallurgy and Materials, the journal in which this Special Issue appears. His stewardship transformed AMM into a recognised international forum for the Polish and Central European materials science community. He was elected Corresponding Member of the Polish Academy of Sciences in 2016, and has served as Chairman of the Committee of Materials Engineering and Metallurgy of PAS since 2019. His engagement with the European materials science community was equally distinguished: as a member of the Executive Committee of the Federation of European Materials Societies (e-FEMS), he played a central role in bringing the EUROMAT congress to Warsaw in 2015 – a milestone for the Polish community – and in initiating annual doctoral exchange meetings between Polish and German young materials scientists that continue to this day.

The breadth and depth of these contributions have been recognised by the highest state honours. Professor Zięba is a recipient of the Silver Cross of Merit (2006), the Knight's Cross of the Order of Polonia Restituta (2012), and the Officer's Cross of the Order of Polonia Restituta (2023), awarded – as the Presidential decree states – for outstanding achievements in scientific research and for the promotion of Polish science in the world. He has also been honoured with the Award of the Chairman of Division IV of PAS, the Scientific Award of the Polish and Russian Academies of Sciences (2011), and, most recently, was granted Honorary Membership of the Polish Society for Materials Science (2025).

Those of us who have had the fortune of working with Professor Paweł Zięba know that behind the long list of achievements stands a person of exceptional warmth, intellectual generosity, and a very particular sense of humour. He has always had the rare gift of making the people around him feel both challenged and supported – of setting high standards while never losing sight of the human dimension of science. He has given freely of his time, his knowledge, and his enthusiasm to young researchers, and colleagues alike. For many of us, he is not only a scientific mentor but a model of how to conduct a scientific life with integrity, passion, and grace.

The papers collected in this Special Issue reflect the remarkable breadth of research that Professor Paweł Zięba has inspired, shaped, and touched over five decades. They are offered as a token of admiration and gratitude from colleagues, collaborators, former students, and friends. We wish him many more years of curiosity, discovery, and the quiet satisfaction of seeing the scientific trees he has planted continue to grow.

Prof. Joanna Wojewoda-Budka

Director, Institute of Metallurgy and Materials Science, Polish Academy of Sciences

General Secretary, Polish Society for Materials Science

Board Member, Federation of European Materials Societies

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