# Laudácio

## RNDr. Eva Majková, DrSc.

**RNDr. Eva Majková, DrSc.,** is one of the most prominent materials physicists and experts in the fields of materials science, nanoscience, and nanotechnology in Slovakia. She graduated from the Faculty of Natural Sciences at Comenius University in Bratislava in 1972, where she subsequently earned her RNDr. degree. In 1980, she earned the CSc degree, and in 2001, she defended her DrSc thesis. She has worked at the Institute of Physics of the Slovak Academy of Sciences since 1972. In 1995, after returning from a stay at the University of Nancy, she founded the Department of Multilayers and Nanostructures, focused on research into various types of nanomaterials. From 1999 to 2007, she served as director of the Institute of Physics of the Slovak Academy of Sciences and later, for two terms, as vice-president of the Slovak Academy of Sciences for science and research. From 2017 to 2021, she served as director of the newly established Center for the Application of Advanced Materials at the Slovak Academy of Sciences. Dr. Majková is a distinguished, internationally recognized scientist in the field of materials science. Her most significant results have been achieved in the research of ultrathin multilayers, nanolayers, nanoparticles, and other nano-objects using in situ small-angle and wide-angle X-ray scattering methods at a small angle of radiation incidence on the sample.

In the field of multilayers, she and her group have successfully analyzed, in detail and non-destructively, the processes occurring at multilayer interfaces at the sub-nanometer level as a function of external parameters. The group under her leadership has demonstrated that it is possible to directly and non-destructively identify the formation and presence of clusters in ultrathin layers. This also includes designs for original multilayer structures with high thermal stability.

Since 2000, Dr. Majková has been engaged in the preparation and research of nanoparticles and other low-dimensional materials and their applications in the field of sensors and photovoltaic structures. She initiated the now-routine use of synchrotron radiation sources. Together with her team, she has gained original insights in the field of in situ studies of the formation and growth of clusters and nanocrystals. An original result is the discovery of a new metastable phase during the formation of an ordered array of nanoparticles trapped at the water-air interface and experimental evidence of the presence of vertical correlation of nanoparticles in a multilayer.

Nanoparticles can be functionalized with suitable bioconjugates and subsequently applied in biomedicine, e.g., for the targeted identification of cancer cells and their elimination via the photothermal effect. In this field, Dr. Majková pioneered the use of the photothermal effect for functionalized nanoparticles and nanoflakes. This research is being successfully developed further at the Slovak Academy of Sciences.

In recent years, Dr. Majková has initiated the preparation of perovskite solar cells and investigated the incorporation of nanoparticles and nanoflakes into their structure with the aim of improving their functionality and efficiency.

Throughout this time, Dr. Majková has been dedicated to developing a comprehensive instrumental infrastructure as an essential prerequisite for high-quality research. Of particular note here is the construction of laboratory systems for in situ X-ray observations with high temporal resolution for a wide range of materials. The facilities built are unique in many respects and attractive even on an international scale.

Dr. Majkova has led four projects funded under EU framework programs, as well as APVT and APVV projects, 11 projects funded by the EU Structural Funds, and others. Notably, the CEMEA project, part of the Horizon 2020 call, received the Seal of Excellence and secured national funding from the EU Structural Funds. The goal of the project, in which seven institutes of the Slovak Academy of Sciences (SAS) participated, was to establish a new Center for the Utilization of Advanced Materials at the SAS as a hub for cutting-edge research in the field of advanced materials and technologies. Dr. Majková has served as the director of this center since its founding and has dedicated herself to its development. Implementing the project was challenging under Slovak conditions, but the result is an institution that is now successful in publishing and in securing projects through calls for proposals under the Horizon EU programs and other national and international calls. The project enabled significant development of research infrastructure for all project partners and stimulated their intensive collaboration.

Dr. Majková is the author or co-author of 276 publications (WOS) that have received wide international acclaim; the number of citations in WOS is approaching two thousand, and she holds 3 patents. She is the founder of a prominent scientific school, has supervised 12 PhD students at domestic institutions, and has contributed to the training of 8 doctoral students abroad.

She has also made a significant name for herself on the international stage. She served as the national representative to the International Union of Vacuum Science, Technology and Applications, as a member of program and advisory committees for international conferences, and as a member of the Steering Committee of the ERA-NET Micro-nanotechnology program. She was also the national representative to the European Organization for the Use of Synchrotron Radiation Sources and a member of the IDEAS program, the ERC under the EU's 7th Framework Program, and Horizon 2020. She has also held positions in national bodies and societies, served as a member of university faculty scientific councils, grant agency committees, and the Presidium of the Slovak Battery Alliance (2019–2022). She is a member of the European Academy of Sciences and Arts

**The Gold Medal of the Slovak Academy of Sciences is an expression of recognition for Dr. Majková's scientific contribution to the development of Slovak science and her achievements in building a research environment capable of standing up to international competition.**