Foreword

As Honorary Chairman of the workshop's executive committee it is my great pleasure to present in this issue, dedicated to the *Proceedings*, post-conference peer-reviewed papers from the *11th Japanese–Mediterranean Workshop on Applied Electromagnetic Engineering for Magnetic, Superconducting, Multifunctional and Nano Materials* (JAPMED'11), a landmark in the development of materials, advanced manufacturing and electrical engineering, organized at the Shota Rustaveli State University, Batumi, Georgia 16–19 July 2019.

This conference, held every two years, has been jointly organized this time by the *Project Centre for Nanotechnology and Advanced Engineering*, a joint initiative of the Greek National Centre for Scientific Research "Demokritos" and the Russian Research Centre "Kurchatov Institute", the *Japan Society of Applied Electromagnetics and Mechanics*, *Texas A&M University* and the *University of Nevada Reno* in the USA, the *Faculty of Electrical Engineering and Electronics* of the *National Technical University of Athens*, the *Izmir Institute of Technology*, Turkey, the *Beijing Institute of Technology*, China and the *Shota Rustaveli State University* in Batumi and the *Georgian Technical University* in Tbilisi, Georgia.

The JAPMED originated in the late 1990s, actually we celebrate this year its 20th anniversary, from the previous, very successful, *1st* and *2nd Japanese–Greek Joint Workshops*, held in Athens, Greece in May 1999 and Oita, Japan in May 2001, respectively. Subsequently, it was extended to a wider international participation and coöperation, with the 3rd event hosted back in Athens in May 2003, the 4th in Cairo in September 2005, the 5th in Larnaca, Cyprus in September 2007, the 6th in Bucharest in July 2009, the 7th in Budapest in July 2011, the 8th back in Athens in June 2013, the 9th in Sofia in July 2015 and the 10th in Izmir (Smyrna) in July 2017. The workshop provides a forum for specialists from universities, research centres and industry of diverse countries worldwide to share knowledge and experience leading to cross-fertilization of new ideas and developments and the establishment of coöperation in the *design, analysis, new materials utilization* and *optimization techniques* in the broad areas of *electromagnetics* and *advanced manufacturing of advanced materials* and their *sustainable industrial applications*, in the modern technological sectors of *precision/ultraprecision engineering, nanotechnology, powder production* and *processing associated with high strain-rate phenomena, electricity* and *electronics, bioengineering, transportation, safety* and *defence, energy* and the *environment*.

High- and *low-temperature superconductivity* constituted the first special topic of the Workshop, focusing on the then recent progress in the physics, mechanics and materials science of low- and high-temperature superconductors, with projections to emerging and future applications.

Magnetic materials, such as *magnetoresistors* and *ferroelectrics*, as well as *conventional ferromagnetic materials* and *electromagnetics*, constituted the second special topic, with special interest attaching to results that appeared to be breakthroughs, either conceptually or in the applications they might generate.

The scope of the Workshop was then further expanded over the years towards advanced manufacturing to include the modern fields of *nanotechnology, precision/ultraprecision manufacturing, biomedical engineering* and *transport.* Six years ago, two additional topics have been included: *multifunctional materials*, especially in relation to *computational mechanics*, (i.e. the interests at that time of the International Institute for Multifunctional Materials for Energy Conversion (IIMEC) of Texas A&M University), and *shock loading of materials and structures*, as part of the *Shockwaves Cluster* that was then established, involving coöperation between Greece, Russia, the USA, Germany, Japan, China, Hungary, Ukraine, Turkey, Georgia and India. The purpose of this international effort is the strong desire that we have to enhance our efforts and coöperation towards these advanced technologies, which may greatly affect our lives in the future.

Since *sustainability* nowadays prevails in science, technology, industry and many other parts of human life, as a follow-up of my *Sustainability Award* for the *Sustainable Industrial Processing Summit (SIPS) 2018 Mamalis International Symposium on Advanced Manufacturing of Advanced Materials and Structures with Sustainable Industrial Applications* last November in Rio de Janeiro, s*ustainability* has been incorporated into the JAPMED topics, with the aim of still further enhancing our international collaboration.

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