

# Preface

As Honorary Chairman of the Executive Committee it is my great pleasure to present the extended versions of selected papers from the 7<sup>th</sup> Japanese-Mediterranean and Central European Workshop on Applied Electromagnetic Engineering for Magnetic Superconducting and Nano Materials, organized in 6-9 July 2011 in Budapest, Hungary, constituting a landmark in the development of materials, manufacturing and electrical engineering.

This Conference, held every two years, is jointly organized by the National Technical University of Athens (Laboratory of Manufacturing Technology and Laboratory of Electrical Machines) and the Japan Society of Applied Electromagnetics and Mechanics and originated from the very successful previous 1<sup>st</sup> and 2<sup>nd</sup> Japanese-Greek Joint Workshops, held in Athens, Greece in May 1999 and in Oita, Japan in May 2001, respectively. The 3<sup>rd</sup> event has been extended to further Mediterranean and International participation and cooperation and has been hosted in Athens, Greece in May 2003 while the 4<sup>th</sup> event has been organized in Cairo, Egypt in September 2005, the 5<sup>th</sup> event in Larnaca, Cyprus in September 2007 and the 6<sup>th</sup> in Bucharest, Romania in July 2009. This time the 7<sup>th</sup> Workshop has been organized in Budapest, Hungary in July 2011. It provided a forum for specialists from universities, research centers and industry of various countries worldwide to establish cooperation, to share knowledge and experience and the cross-fertilization of new ideas and developments in the design, analysis, new materials utilization and optimisation techniques in the areas of applied electromagnetics and manufacturing of advanced materials and their industrial applications in modern technologies in electricity/electronics, transportation, bioengineering, energy and environment.

The high-temperature superconductivity constitutes the first preferential subject of the Workshop, focusing on the recent progress in physics, mechanics, materials and applications of high-temperature superconductors, with a projection to the emerging and future areas in science and technology.

Magnetic materials, such as magneto-resistance and ferroelectric materials, as well as conventional ferromagnetic materials and electromagnetics, constitute the second preferential subject, with results that appear to exhibit a breakthrough either conceptually or in the applications they generate.

The scope of the Conference has been further expanded to include the modern exciting areas, like nanotechnology, ultraprecision engineering and bioengineering, with the strong belief, that we have to enhance our efforts and cooperation towards these advanced technologies, which may greatly affect our lives in the future.

Academician Professor Dr.-Ing. Dr.h.c. Prof.h.c. A. G. Mamalis  
JAPMED7 Honorary Executive Committee Chair

## **EXECUTIVE COMMITTEE**

### **Honorary Chairman**

**A. G. Mamalis** (Project Center for Nanotechnology and Advanced Engineering, Greece)

### **Chairman**

**M. Enokizono** (Oita University, Japan)

### **Co-Chairmen**

**A. Kladas** (National Technical University of Athens, Greece)

**I. Vajda** (Budapest University of Technology and Economics, Hungary)

### **Secretariat**

**T. Todaka** (Oita University, Japan)

## **INTERNATIONAL ADVISORY COMMITTEE MEMBERS**

**M. Abdou** (University of California at Los Angeles, USA)

**O. Bíró** (Graz University of Technology)

**L. Chubraeva** (NII Electromash, Russia)

**D. Ebihara** (Musashi Technical University, Japan)

**B. Ertan** (Middle East Technical University of Ankara, Turkey)

**W. Gawalek** (Institute for Physical High Technology, Germany)

**A. Grabczenko** (National Technical University "Kharkov Polytechnic Institute, Ukraine)

**J. Hajtó** (Bay Zoltán Foundation, Hungary)

**F. Hănțilă** (Politehnica University of Bucharest, Romania)

**H. Hashizume** (Tohoku University, Japan)

**E. Hristoforou** (National Technical University of Athens, Greece)

**M. Ioannidis** (National Technical University of Athens, Greece)

**N. Kanellopoulos** (National Center for Scientific Research Demokritos, Greece)

**Y. Kawase** (Gifu University, Japan)

**P. Kervalishvili** (Technical University of Tbilisi, Georgia)

**V. Kirko** (Research Institute of Physics and Engineering, Russia)

**M. Kowalchuk** (RRC Kurchatov Institute, Russia)

**A. Lagutin** (RRC Kurchatov Institute, Russia)

**V. Lasarov** (Technical University of Sofia, Bulgaria)

**Y. Lavrynenko** (National Technical University "KharkovPolytechnic Institute, Ukraine)

**L. Litvinov** (Institute of Monocrystals, Ukraine)

**L. Lukács** (Miklós Zrinyi National Defence University, Hungary)

**O. Lysenko** (Bakul Institute for Superhard Materials, Ukraine)

**M. Maricar** (Politehnica University of Bucharest, Romania)

**E. Matsumoto** (Kyoto University, Japan)

**K. Nagaya** (Gunma University, Japan)

**D. Niarchos** (National Center for Scientific Research Demokritos, Greece)

**N. Novikov** (Bakul Institute for Superhard Materials, Ukraine)

**H. Ohsaki** (The University of Tokyo, Japan)

**Y. Okazaki** (Gifu University, Japan)

**S. Ovchinnikov** (Kirensky Institute of Physics, Russia)

**T. Prikhna** (Bakul Institute for Superhard Materials, Ukraine)

**J. Prohaszka** (Hungarian Academy of Sciences, Hungary)

**J. Ramsden** (Cranfield University, UK)

**B. Raveau** (ISMRA, France)

**A. Razek** (Ecole Supérieure d'Electricité, France)

**K. Salama** (University of Houston, USA)  
**K. Spentzas** (National Technical University of Athens, Greece)  
**A. Szalay** (S-Metalltech Ltd, Hungary)  
**J. Tani** (Tohoku University, Japan)  
**J. Tegopoulos** (National Technical University of Athens, Greece)  
**Th. Tsibukis** (Aristotle University of Thessaloniki, Greece)  
**E. Ugrinovich** (RRC Kurchatov Institute, Russia)  
**H. Yamashita** (Hiroshima University, Japan)

## **TECHNICAL PROGRAM COMMITTEE**

### **Chairman**

**T. Todaka** (Oita University, Japan)

### **Members**

**Amália Iványi** (University of Pecs)

**József Pávo** (BME)

**Evangelos Hristoforou** (National Technical University of Athens, Greece)

**Janos Kosa** (Kecskemet College)