

Proceedings of the  
12th International Symposium on Physics of Materials  
ISPMA-12

Prague, September 4-8, 2011

*Editors of the Proceedings:*

F. Chmelík, R. Král, and J.L. Martin

WARSAW

---

POLISH ACADEMY OF SCIENCES  
INSTITUTE OF PHYSICS

### **International Committee:**

Chairman:

F. Chmelík (Czech Republic)

Members:

G. Eggeler (Bochum, Germany)	Y. Estrin (Clayton, Australia)	E. Evangelista (Ancona, Italy)
P. Haušild (Prague, Czech Republic)	K. U. Kainer (Geesthacht, Germany)	G. Kostorz (Zürich, Switzerland)
R. Král (Prague, Czech Republic)	T. G. Langdon (Los Angeles, USA)	J. Lapin (Bratislava, Slovakia)
P. Lejček (Prague, Czech Republic)	J. Lendvai (Budapest, Hungary)	P. Louda (Liberec, Czech Republic)
P. Lukáč (Prague, Czech Republic)	P. Svoboda (Prague, Czech Republic)	V. Šíma (Prague, Czech Republic)
M. Šob (Brno, Czech Republic)	Z. Trojanová (Prague, Czech Republic)	L. Wagner (Clausthal, Germany)
	M. Zehetbauer (Vienna, Austria)	

### **Local Organising Committee:**

Chairman:

P. Málek

Members:

R. Černá, P. Dobroň, M. Hájek, T. Janeček

### **Scope:**

The Department of Physics of Materials, Charles University Prague, has been regularly organising International Symposia on Physics of Materials (ISPMA). The series started in 1972 under a title International Symposium on Plasticity of Metals and Alloys. The Symposium ISPMA 12 organised in cooperation with the Metals Science Society of Czech Republic was focused on fundamental and applied aspects of physics of alloys, intermetallics, non-metallic materials, composites, submicrocrystalline and nanocrystalline materials, and materials science.

## Preface

This special issue contains papers presented at the International Symposium on Physics of Materials (ISPMA) organised by the Department of Metal Physics of the Charles University. This Symposium, which was held at the historical building of the Conference and Social Centre “Professed House” of the Faculty of Mathematics and Physics, Charles University, in Prague, Czech Republic, 4–8 September 2011, was the 12th in a series of the ISPMA Symposia (formerly International Symposium on Plasticity of Metals and Alloys).

The first symposium in this series was held in 1972 in Prague. Subsequent meetings were held every 3 or 4 years. The main idea of the symposia was to bring together an international group of physicists and materials scientists dealing with the plasticity of metals and alloys. Up to 1989, these conferences were also occasions where the scientists from West and East could meet easily. The late Professor Peter Haasen helped for many years in promoting good relations between researchers from the west and the east. He was one of those who contributed considerably to maintain a high scientific level of this symposia series. He did very much for the advancement of metal physics at Charles University. Therefore, the Department of Metal Physics as the organiser of ISPMA decided to honour his memory by a memorial lecture in materials science that will be held on the occasion of each ISPMA. Professor Gernot Kostorz (ETH Zürich, Switzerland) held the Haasen memorial lecture during the 12th Symposium.

The scientific program of the Symposium consisted of 17 thematic sessions. 19 invited keynote lectures were presented during the Symposium. The invited keynote speakers were: A. Fraczkiewicz (St. Etienne, France), I. Groma (Budapest, Hungary), M. Janeček (Prague, Czech Republic), K. U. Kainer (Geesthacht, Germany), M. Karlík (Prague, Czech Republic), J. Koike (Sendai, Japan), G. Kostorz (Zürich, Switzerland), R. Kužel (Prague, Czech Republic), T. G. Langdon (Los Angeles, USA and Southampton, UK), K. Máthis (Prague, Czech Republic), A. Mortensen (Lausanne, Switzerland), H. M. Petrilli (São Paulo, Brasil), C. Rentenberger (Vienna, Austria), H.-E. Schaefer (Stuttgart, Germany), F. Siska (Geelong, Australia), B. Strnadel (Ostrava, Czech Republic), S. Takaki (Kyushu, Japan), L. Wagner (Clausthal, Germany), V. Vitek (Philadelphia, USA).

The number of participants of the symposium was about 135 from 21 countries around the world, including Algeria, Australia, Austria, Brazil, France, Germany, Hungary, Italy, Japan, Jordan, PR China, Poland, Russia, Slovakia, South Korea, Switzerland, Taiwan, Turkey, Ukraine, USA, and Czech Republic.

The Symposium organisers express their gratitude to those who accepted invitations to present keynote lectures and to those who participated in the Symposium. They also thank all members of the International and Local Organising Committees and the staff of the Professed House for their contributions to a successful meeting. Finally, they gratefully acknowledge the competent advice from all those who helped in the refereeing process of the manuscripts presented in this issue.

ISPMA 12 Chairs: F. Chmelík, P. Málek

Editors: F. Chmelík, R. Král, J.L. Martin