

CONTENTS

WELCOME MESSAGE	13
TOPICS	14
GENERAL INFORMATION	15
Part I	
FINAL PROGRAMME	
Final Programme	18
Part II	
INVITED LECTURES	
Floating zone growth of low twinning stress MIR crystals with low chemical segregation	
Ross H. Colman	30
Soft shearing modes in NiMnGa martensites – the effects of modulation and doping	
Lucie Bodnárová, Petr Sedlák, Martin Zelený, Oleg Heczko, Ladislav Straka, Alexei Sozinov, Hanuš Seiner	32
Ab initio design strategies for NiMn-based ferromagnetic shape memory alloys	
Tilman Hickel, Biswanath Dutta, Irina Stockem, Fritz Körmann, Jörg Neugebauer	34
Neutron diffraction and the interplay between structure and magnetism in high temperature FSMAs	
Jose Maria Porro, Anabel Pérez-Checa, Patricia Lázpita, Jorge Feuchtwanger, Anne Stunault, Jose Manuel Barandiarán, Alexey Sozinov, Kari Ullakko, Volodymyr Chernenko	36
Towards achieving prominent magnetocaloric and elastocaloric properties in magnetic shape-memory alloys	
Daoyong Cong, Yuhai Qu, Zhi Yang, Xiaoming Sun, Zhen Chen, Yandong Wang	38
Combining thermal and magnetic tripping of MSM in next-generation miniature circuit breakers	
Sebastian Breisch, Arda Tüysüz	40
Tailoring hysteresis in magnetocaloric Ni-Mn-Ga-Co films	
Anett Diestel, Robert Niemann, Sebastian Fähler	42
X-ray magnetic circular dichroism under pulsed magnetic field for Ni-Co-Mn-In ferromagnetic shape memory alloy	
Rie Umetsu, Hiromasa Yasumura, Yasuo Narumi, Yoshinori Kotani, Tetsuya Nakamura, Hiroyuki Nojiri, Ryosuke Kainuma	44
Additive manufacturing: Opportunities and challenges for functional magnetic materials	
Markus Chmielus, Erica Stevens, Amir Mostafaei, Pierangeli Rodriguez de Vecchis, Rafael Rodriguez de Vecchis , Aaron Acierno, Katerina Kimes, Jakub Toman	46
Instability of modulation in thin foils of magnetic shape memory alloy: from NM’ to NM	
Yanling Ge, Ladislav Straka, Simo-Pekka Hannula, Oleg Heczko	48
Decomposition of Heusler alloys	
Vladimir Sokolovskiy, Markus Gruner, Peter Entel, Mehmet Acet, Vasilii Buchelnikov	50

Part III

LECTURES

Highly mobile type I and type II twin boundaries in 14M Ni-Mn-Ga-Fe martensite

Alexei Sozinov, Denys Musiienko, Andrey Saren, Petr Veřtát, Ladislav Straka, Oleg Heczko, Martin Zelený, Robert Chulist, Kari Ullakko 54

What is the physical origin for the twinning stress in Ni-Mn-Ga?

Eilon Faran, Itamar Benichou, Sefi Givli, Doron Shilo 56

Combinatorial synthesis of Ni-Mn-Ga(Fe-Co-Cu) high temperature ferromagnetic shape memory alloys

Vasileios Alexandrakis, Anabel Pérez-Checa, José Manuel Barandiaran, Patricia Lázpita, Peer Decker, Steffen Salomon, Jorge Feuchtwanger, Alfred Ludwig, Volodymyr Chernenko 58

Magnetic phase diagrams in $\text{Co}_2\text{Cr}(\text{Ga},\text{Si})$ alloys with reentrant martensitic transformation behavior

Xiao Xu, Takumi Kihara, Atsushi Miyake, Masashi Tokunaga, Toshihiro Omori, Takeshi Kanomata, Ryosuke Kainuma 60

Crystal structure and superelasticity in Pd-Mn-Ga alloys

Tatsuya Ito, Yuta Kimura, Xiao Xu, Toshihiro Omori, Ryosuke Kainuma 62

Reversible martensite variant reorientation induced by martensite aging in ferromagnetic NiFeGaCo and NiMnGa single crystals

Elena Panchenko, Ekaterina Timofeeva, Maria Pichkaleva, Anna Eftifeeva, Aida Tokhmetova, Nikita Surikov, Yuri Chumlyakov, Gregory Gerstein, Hans Jürgen Maier 64

Effects of iron and copper on the martensitic transformation of Ni-Mn-Ga

Andrew Armstrong, Frans Nilsén, Michal Rameš, Tomas Kmjec, Ladislav Straka, Oleg Heczko, Peter Müllner 66

Type I and Type II twinning shear stress of Ni-Mn-Ga

Peter Müllner 68

Twin boundary dynamics in 10M Ni-Mn-Ga martensite

Andrey Saren, Kari Ullakko 70

Non-conventional twinning and macro-twinning in 10M NiMnGa

Hanuš Seiner, Robert Chulist, Alexei Sozinov, Ladislav Straka, Oleg Heczko 72

Hierarchical twin microstructure in modulated 10M Ni Mn-Ga single crystals. An analysis beyond the continuum mechanics

Robert Chulist, Kinga Nalepka, Alexei Sozinov 74

The effect of loading rate on characteristics of twin boundary motion in Ni-Mn-Ga

Noam Zreihan, Eilon Faran, Doron Shilo 76

Electron localization in Ni_2MnGa alloy

Martin Zelený, Petr Sedlák, Ladislav Straka, Hanuš Seiner, Oleg Heczko 78

Martensitic transformation sequence of $\text{Ni}_2\text{Mn}_{1.2}\text{Ga}_{0.8}$ alloy by first-principles calculations

Jing Bai, Jinlong Wang, Claude Esling, Xiang Zhao, Liang Zuo 80

Correlation effects on ground-state properties of $\text{Fe}_2\text{Ni}_{1+x}\text{Ga}_{1-x}$ Heusler alloys: ab initio study

Vasily Buchelnikov, Vladimir Sokolovskiy, Olga Miroshkina, Mikhail Zagrebin, Johannes Nokelainen, Aki Pulkkinen, Bernrdo Barbiellini, Erkki Lähderanta 82

Point defects in magnetic shape memory alloys: A first-principles study	
Biswanath Dutta, Poulumi Dey, Fritz Körmann, Tilmann Hickel, Jörg Neugebauer	84
The effect of various model features on predicting the macro-scale magneto-mechanical behavior of magnetic shape memory alloys	
Heidi P. Feigenbaum, J. Lance Eberle, Constantin Ciocanel, Glen J. D'Silva	86
Site and magnetic configuration dependent phase stability in off-stoichiometric shape memory system Ni-Mn-Sb	
Sheuly Ghosh, Subhradip Ghosh	88
On magneto-mechanical characterization methods for magnetic shape memory component models	
Fabian Ehle, Peter Neumeister, Holger Neubert	90
Describing the hierarchical martensitic microstructure of modulated Heusler alloys by a single parameter	
Stefan Schwabe, Robert Niemann, Hanus Seiner, Oleg Heczko, Markus E. Gruner, Kornelius Nielsch, Sebastian Fähler	92
Crystallographic evolution of martensite cluster in austenite Ni-Mn-Ga alloys under uniaxial loading	
Long Hou, Ying Niu, Yanchao Dai, Lansong Ba, Yves Fautrelle, Zongbin Li, Bo Yang, Zhongming Ren, Claude Esling, Xi Li	94
Combined effect of magnetic field and hydrostatic pressure on transformation behaviour in Ni-Mn-In alloy	
Volodymyr A. Chernenko, Patricia Lázpita, J. Rodríguez Fernández, Victor Lvov, Jose M. Barandiarán	96
Stress-induced martensite and mechano-magnetic energy conversion of Co-Ni-Ga	
Paul Lindquist, Volodimir Chernenko, Eduard Cesari, Peter Müllner	98
Magnetic emission during structural changes in ferromagnetic shape memory alloys	
Dezső Beke, Lajos Daróczi, László Tóth, Melinda Bolgár, Nora Samy	100
Mezoscopic features of 10M Ni-Mn-Ga martensite: a/b twin laminate, antiphase boundaries and magnetic domains walls	
Oleg Heczko	102
Elastocaloric effect in Ni-Co-Mn-Ti all-d-metal Heusler alloy	
Yi Shen, Zhiyang Wei, Jian Liu	104
Caloric and multicaloric effects on Ni-Mn-In SMA subjected to uniaxial stress and magnetic field	
Adrià Gràcia-Condal, Tino Gottschall, Maximilian Fries, Lukas Pfeuffner, Oliver Gutfleisch, Antoni Planes, Lluís Mañosa	106
Enhanced barocaloric effect in Pd-In-Fe shape memory alloys by hydrostatic pressure training	
Yanfeng Liu, Qi Shen, Fenghua Chen, Jian Liu	108
Hardness measurements in a 10M NiMnGa single crystal	
Emmanouel Pagounis, Grzegorz Cios, Robert Chulist, Markus Laufenberg	110
Towards engineering magnetic shape memory films and nanostructures	
Milad Takhsha Ghahfarokhi, Francesca Casoli, Simone Fabbrici, Lucia Nasi, Federica Celegato, Riccardo Cabassi, Giovanna Trevisi, Davide Calestani, Paola Tiberto, Vojtech Uhlik, Franca Albertini	112

Tailoring magneto-structural transition and twinning microstructure towards large recoverable magnetostrain effect	
Jingmin Wang, Panpan Li, Hui Hua, Qijia Yu, Chengbao Jiang	114
Magnetic coercivity control for novel functionality in Ni-Mn-Ga(-B) single crystals	
Ladislav Straka, Ladislav Fekete, Michal Rameš, Eduard Belas, Oleg Heczko	116
Microstructure, magnetic property and the extremely shortened homogenizing process of melt extracted La-Fe-Si microwires	
Ruochoen Zhang, Xuexi Zhang, Mingfang Qian	118
Influence of microstructure and texture on hysteresis in epitaxial Ni-Mn-Ga-Co films	
Klara Lünser, Kornelius Nielsch, Sebastian Fähler	120
Large adiabatic temperature change driven by magnetostructural transition in a $\text{Ni}_{50}\text{Mn}_{18.5}\text{Ga}_{25}\text{Cu}_{6.5}$ alloy	
Dewei Zhao, Jian Liu, Yi Shen	122
Manipulating the martensitic phase transition of NiMnGa thin films	
Bruno Weise, Niclas Teichert, Klara Lünser, Kornelius Nielsch, Andreas Hütten, Maria Krautz, Anja Waske, Sebastian Fähler	124
Caloric effects in $\text{Ni}_{50}\text{Mn}_{19}\text{Cu}_6\text{Ga}_{25}$ alloy with paramagnetic austenite to ferromagnetic martensite transformation	
Concepcio Seguí, Joan Torrens-Serra, Eduard Cesari Patricia Lázpita	126
Strain induced dielectric enhancement in AlN based multiferroic layered structure	
Shuvam Pawar, Anuj Kumar, Davinder Kaur	128
Wide structural and magnetic successive transitions and related magnetocaloric properties in a directionally solidified polycrystalline Ni-Co-Mn-In alloy	
Feng Chen, José Luis Sánchez Llamazares, César Fidel Sánchez-Valdés, Peter Müllner, Yunxiang Tong, Li Li	130
Degradation of magnetocaloric effect in Ni-Mn-In Heusler alloys in cyclic magnetic fields	
Akhmed Aliev, Adler Gamzatov, Akhmed Batdalov, Lazer Khanov, Alexander Kamantsev, Alexey Mashirov, Victor Koledov, Vladimir Shavrov	132
Magneto-optics: how it can be useful in the research of martensitic transformation	
Martin Veis, Daniel Kral, Lukáš Nowak, Stefan Schwabe, Lukáš Beran, Sebastian Fähler, Martin Zeleny, Jan Zemen, Jaroslav Hamrle, Oleg Heczko	134
Magnetic domains observations in Ni-Mn-Ga alloys by advanced Kerr microscopy	
Alexej Perevertov, Oleg Heczko, Rudolf Schaefer	136
Evolution of magnetic domains during magneto-mechanical loading of Ni-Mn-Ga	
Heidi P. Feigenbaum, Glen J. D'Silva, Constantin Ciocanel	138
Energies of magnetic domains in twinned Ni-Mn-Ga	
Medha Veligatla, Carlos J. Garcia-Cervera, Peter Müllner	140
Role of magnetic domains and macroscopic magnetization in “elastic” softening of Ni_2MnGa in the ferromagnetic cubic phase and during premartensitic transformation	
Sergey Kustov, Miguel Lluís Corró, Jaume Rosselló, Vladimir Kaminskii, Konstantin Sapozhnikov, Andrey Saren, Alexei Sozinov, Kari Ullakko	142

A simple method to characterize twin boundary kinetics in Ni-Mn-Ga	
Bibek Karki, Yotam Bachar, Itay Harel, Eithan Kaplan, Arik Sabag, Doron Shilo, Peter Mullner, Eilon Faran	144
Nonlinear vibrational characteristics of 10M martensite of NiMnGa and NM martensite of NiMnGaCoCu	
Petr Sedlak, Hanus Seiner, Lucie Bodnarova, Ladislav Straka, Alexei Sozinov, Oleg Heczko	146
The mechanism of formation of Type II Twins in Ni₂MnGa	
Robert Pond, Bibek Karki, Peter Müllner	148
Optimization of magneto-mechanical properties to increase the efficiency of actuator elements	
Andrea Böhm, Miguel Panesso, Kenny Pagel, Welf-Guntram Drossel	150
A design tool for magnetic shape memory actuators and application	
Annabell Effner, Fabian Ehle, Tobias Zawada	152
Magnetoelectric coupling in ferromagnetic shape memory alloys based multiferroic heterostructure for magnetic field sensing application	
Anuj Kumar, Shuvam Pawar, Davinder Kaur	154
Laser based 4D printing of Ni-Mn-Ga MSM alloy	
Ville Laitinen, Alexei Sozinov, Andrey Saren, Kari Ullakko	156
NiMnGa/Si bimorph nanoactuation for photonics applications	
Manfred Kohl, Franziska Lambrecht, Randy Fechner, Ivan R. Aseguinolaza, Volodymyr Chernenko	158
Atomic order domain size effects on the martensitic transformation in metamagnetic shape memory alloys	
Daniel Salas, Thien Duong, Yuhao Wang, Yang Ren, Yuriy Chumlyakov, Raymundo Arroyave, Ibrahim Karaman	160
Ni-Mn-Ga magnetic shape memory alloy for high-speed actuation in micro-magneto-mechanical systems	
Denys Musiienko, Andrey Saren, Ladislav Straka, Marek Vronka, Ladislav Klimša, Jaromír Kopeček, Oleksii Sozinov, Kari Ullakko, Oleg Heczko	162
Superelastic properties at cryogenic temperatures in Co-Cr-Al-Si shape memory alloys	
Takumi Odaira, Xiao Xu, Toshihiro Omori, Ryosuke Kainuma	164
First-principles calculations of phase stability and magnetic properties of Ni-Mn-Ga-Ti ferromagnetic shape memory alloys	
Xiang Zhao, Jing Bai, Jinlong Wang, Shaofeng Shi, Claude Esling, Liang Zuo	166
Understanding Heusler alloys for magnetic refrigeration and sensor applications	
Chhayabrita Maji, Sandeep Singh, Soumyadipta Pal, Priya Mahadevan	168
Magnetic martensitic transformation and associated electronic behaviors in NiMnTi(Fe) all-d-metal Heusler alloys	
Qingqi Zeng, Jianlei Shen, Hanning Zhang, Enke Liu	170
Studies on effect of temperature on the Photo Induced Micro-Actuation effect of a Co-based FSMA system	
Abhishek Bagchi, Suman Sarkar, Sandip Bysakh, Susenjit Sarkar, Pratip Kumar Mukhopadhyay	172

Cyclic stability of two-way shape memory effect in ferromagnetic CoNiAl single crystals Anna Eftifeeva, Elena Panchenko, Yuriy Chumlyakov, Gegory Gerstein, Hans Jürgen Maier	174
Strong magnetic field suppression of the martensitic transformation in Mn-Ni(Fe)-Sn MetaMSMAs Patricia Lázpita, Anabel Pérez Checa, Jose M. Barandiarán, Andrew Ammerlaan, Uli Zeitler, Volodymyr Chernenko	176
Study of phase transformation temperatures of Ni-Mn-Ga-Fe-Cu Frans Nilsén, Andrew Armstrong, Michal Rameš, Ross Colman, Tomas Kmjec, Ladislav Straka, Peter Müllner, Oleg Heczko	178
The effect of γ phase on the martensite variant reorientation in $\text{Ni}_{58}\text{Mn}_{25}\text{Ga}_{17}$ alloys Yanchao Dai, Long Hou, Robert Chulist, Xi Li	180
Fe-doped ferromagnetic shape memory Ni-Mn-Sn alloys Xuexi Zhang, Hehe Zhang	182
 Part IV POSTERS	
Large room-temperature elastocaloric effect in Sn-doped Ni-Mn-In metamagnetic shape memory alloys Yaning Xiao, Wen Sun, Jian Liu, Hu Zhang	186
Superelasticity behavior in Ni–Mn–In–Co polycrystalline magnetic shape memory alloys Binfeng Lu, Jian Liu	188
Effect of the k-mesh on the phonon spectrum of Ni_2MnGa Olga Miroshkina, Vasily Buchelnikov, Alexey Zayak, Vladimir Sokolovskiy, Mik Zagrebin, Yulia Sokolovskaya	190
Ab initio study of magnetic properties of $\text{Fe}_{75-x}\text{V}_x\text{Al}_{25}$ alloys Mariya Matyunina, Mikhail Zagrebin, Vladimir Sokolovskiy, Vasiliy Buchelnikov	192
T-x phase diagram in Heusler compounds $\text{Ni}_{2+x}\text{MnGa}_{1-x}$ Tetsujiro Eto, Xiao Xu, Tatsuya Ito, Fuminori Honda, Dexin Li, Gendo Oomi, Ryosuke Kainuma, Takeshi Kanomata	194
Huge superelasticity in ferrous single crystalline shape-memory alloy Monika Czerny, Grzegorz Cios, Wojciech Maziarz, Yury Chumlyakov, Norbert Schell, Robert Chulist	196
Ferromagnetic Ni-Mn-Ga-Cu shape memory alloy for microsystem technology Alexey Mashirov, Artemy Irzhak, Alexander Kamantsev, Dewei Zhao, Jian Liu, Victor Koledov, Vladimir Shavrov	198
The effect of γ ‘precipitates on the superelastic strain and martensitic transformation in Fe-based single crystals Wojciech Maziarz, Monika Czerny, Anna Wójcik, Grzegorz Cios, Yuri I. Chumlyakov, Norbert Schell, Robert Chulist	200
Zn- and Cd-doping in Ni-Mn-Ga alloys: A first-principles study Jozef Janovec, Martin Zelený, Alexei Sozinov, Ladislav Straka, Oleg Heczko	202

The effect of atomic order and microstructure on hysteresis behavior and inverse magnetocaloric effect in rapidly solidified ribbons	
Anna Wojcik, Pawel Czaja, Robert Chulist, Maciej Kowalczyk, Tomasz Czeppe, Wojciech Maziarz	204
Twin boundary mobility in Ni-Mn-Sn magnetic shape memory alloys	
Paweł Czaja, Robert Chulist, Tomasz Tokarski, Anna Wójcik, Wojciech Maziarz	206
Magnetic anisotropy of non-modulated tetragonal Ni-Mn-Ga-Co-Cu crystals	
Michal Rames, Oleg Heczko, Alexei Sozinov, Kari Ullakko, Ladislav Straka	208
Ferromagnetic transition metals doping Ni₂MnGa alloy	
Vít Kopecký, Michal Rameš and Oleg Heczko	210
First-principles study of phase stability in Mn-excess Ni-Mn-Ga alloys	
Martin Zelený, Martin Heczko, Ladislav Straka, Oleg Heczko	212
Martensitic transformation in Fe₄₄Mn₂₅Ga₃₁ Heusler alloy studied by Mössbauer spectroscopy	
Denisa Kubániová, Tomáš Kmječ, Oleg Heczko	214
Fe₂MnSn: A hexagonal Heusler analogue	
Marie Kratochvílová, Michal Dušek, Ross Colman, Jiří Pospíšil	216
Thermally-induced changes in modulated structure of 10M Ni-Mn-Ga-Fe martensite	
Petr Veřtát, Ladislav Straka, Milan Klicpera, Oliva Pacheroová, Alexei Sozinov, Oleg Heczko	218
EBSD observations of Laminates in 10M martensite Ni-Mn-Ga magnetic shape memory single crystal	
Jaromír Kopeček, Ladislav Klimša, Jan Duchoň, Jan Drahokoupil and Oleg Heczko	220
Magneto-optical spectroscopy and electronic structure of ferromagnetic Fe-Mn-Ga Heusler alloys	
Daniel Kral, Lukáš Beran, Martin Zeleny, Jan Zemen, Roman Antos, Jaroslav Hamrle, Oleg Heczko, Martin Veis.....	222
Magnetic and acoustic emission during superplastic deformation of martensitic Ni₂MnGa single crystal	
Lajos Daróczi, Aniko Hudák, Laszlo Tóth, Dezso Beke	224
Abnormal thermal expansion and correlated magnetic properties of antiperovskite Mn₃XN compounds	
Ying Sun, Kewen Shi, Sihao Deng, Qingzhen Huang, Cong Wang	226
Broadening refrigeration temperature regions in ferromagnetic shape memory alloys	
Dunhui Wang	228
The magnetoelastic transitions and magnetostriction in the Mn_{1.95}Cr_{0.05}Sb single crystal	
Kun Xu, Yiming Cao, Zhe Li	230
Manipulation of magnetic configuration by static isopressure in NdFeO₃	
Yiming Cao, Kun Xu, Zhe Li, Yuanlei Zhang	232
Realization of reversible giant magnetocaloric effect based on applied external hydrostatic pressure for Ni-Co-Mn-In metamagnetic Heusler alloy	
Zhe Li, Yuanlei Zhang, 2, Kun Xu, Chao Jing, Zongbin Li	234

Annealing effect on magneto-transport property and stress induced dynamic elastic moduli on a Co-Ni-Al FSMA

Bhogoju Rajini Kanth, Md Sarowar Hossain, Pratip Kumar Mukhopadhyay 236

Large elastocaloric effect through two-step structural transformation in a $\text{Ni}_{55}\text{Mn}_{18}\text{Ga}_{27}$ alloy

Zongbin Li, Dong Li, Bo Yang, Xiang Zhao, Liang Zuo 238

Part V

LIST OF PARTICIPANTS

List of Participants 242

Part VI

AUTOR INDEX

Author index 246