

Table of Contents

Preface, Committees

Chapter 1: Scientific Heritage

Professor André Rivière - Zener Medalist

R. Schaller..... 3

Francesco Cordero - Zener Medalist

W. Schranz and V. Soprunyuk..... 5

The History of the Torsion Pendulum and its Use for Internal Friction

Measurements

A. Rivière and S.A.E. Boyer..... 9

Chapter 2: Metal Physics

Peculiarities of Transient Anelastic Relaxation in Fe-27%Ga Alloy with Different Metastable and Equilibrium Structures

I.S. Golovin, A.A. Shcherbakov, J.C. Bauzá, N.Y. Samoylova
and A.M. Balagurov..... 29

Transformation Response and Interface-Mediated Damping in High-Temperature Shape Memory Alloys Containing Ductile Second Phases

S.W. Zhang, Q.A. Li, M.J. Jin, Y.T. Zhu and W.J. Lu..... 37

Transient Anelastic Effects Caused by Diffusion-Controlled Structural Transitions

I.S. Golovin and D. Mari..... 45

Magneto-Mechanical Damping and Phase Transformations in Iron-Based Alloys

I. Tkalec-Vâju, D. Mari, M. Kabchou and I.S. Golovin 65

Characterization of High-Purity Nickel Single Crystals by Mechanical Spectroscopy before Irradiation Creep Tests

A. Nastruzzi, D. Mari, R. Schaublin, J.C. Chen and M.A. Pouchon 73

Chapter 3: Polymers and Composites

Influence of Polymer Matrix Stiffness on Multifunctional Composites Analysed by ROM and Halpin-Tsai Models

F.D. Lambri, F.G. Bonifacich, O.A. Lambri, B. Weidenfeller, G.I. Zelada, M. Lambri,
V. Recarte, V. Sánchez-Alarcos and J.I. Pérez-Landazábal 89

Thermomechanical Stability and Damping Mechanisms in Multifunctional 3D-Printed PCL-Based Composites

F.D. Lambri, F.G. Bonifacich, O.A. Lambri, B. Weidenfeller, G.I. Zelada, M. Lambri,
V. Recarte, V. Sánchez-Alarcos and J.I. Pérez-Landazábal 103

Strain-Dependent Damping of the Fast-Growing and Sustainable Paulownia Wood at Room Temperature

J. Göken, N. Saba and I. Anžel 113

Chapter 4: Functional Materials and Engineering Solutions**Elastic Anomalies in the 2D Van Der Waals $\text{Ti}_3\text{C}_2\text{T}_x$ MXene: Possible Sliding****Ferroelectricity and Ordering of Intercalated Halides**

F. Cordero, H. Pazniak, T. Ouisse, J. Gonzalez-Julian, A. Di Carlo, V. Soprunyuk
and W. Schranz 137

Study of the Thermoelastic Effect in GaN

I. Tkalec-Văju, N. Grandjean and D. Mari 147

In-Flight Investigation of Floating Beads for Sloshing Mitigation for Liquid-Fueled Rockets

M.C.N. Roux, B.A.H. Meunier, L. Cordey and D. Mari 153

Chapter 5: Original Approaches in Condensed Matter Physics**From the Maxwell's Equations of Lattice Deformations to the Description of the Universe by a «Crystalline Ether»**

G. Gremaud 163

Dynamics of Full Skyrmions in a Chiral Liquid Crystal

C. Bachmann, D. Mari and S. Brechet 215

Keyword Index 231

Author Index 233