

# Table of Contents

## Organisation

### Intro

### Participants

## Nanostructures for Photonics

### How Can the Intra-Shell Emissions of Rare Earth and Transition Metal Ions in Thin Films and Nanoparticles Be Stimulated?

M. Godlewski, S. Yatsunenko, A. Opalińska and W. Łojkowski 3

### Optical Properties of Nanocrystalline YAG:Ce

H. Paul, D. Kessler and U. Herr 9

### Blue Laser Diodes by Low Temperature Plasma Assisted MBE

C. Skierbiszewski 17

## Oxide Nanostructures

### Stability, Instability, Metastability and Grain Size in Nanocrystalline Ceramic Oxide Systems

G. Kimmel and J. Zabicky 29

### Mesoporous Crystals of Transition Metal Oxides

W.Z. Zhou 37

### Structural, Magnetic and Electronic Properties of Surface Oxidised Fe Nanoparticles

J. Przewoźnik, T. Tyliszczak, D. Rybicki, J. Żukrowski, W. Szczerba, M. Sikora, C. Kapusta, H. Stepankova, R.F. Pacheco, D. Serrate and M.R. Ibarra 47

### Nanosized Barium Hexaferrite Powders Obtained by a Single Microemulsion Technique

T. Koutzarova, S. Kolev, K. Grigorov, C. Ghelev, I. Nedkov, M. Ausloos, R. Cloots, T. Mydlarz and A. Zaleski 55

### Synthesis of Titania Nanostructures and their Application as Catalyst Supports for Hydrogenation and Oxidation Reactions

L.M. Sikhwivhilu, S.S. Ray and N.J. Coville 61

### Magnetic Anisotropy of Co Films Annealed by Laser Pulses

J. Kisielewski, K. Postava, I. Sveklo, A. Nedzved, P. Trzciński, A. Maziewski, B. Szymański, M. Urbaniak and F. Stobiecki 69

## Carbon Nanostructures

### First Principle Investigation of Structural Properties of Potassium Doped Fullerene Clusters – $K_n(C_{60})_2$

M. Sokół and Z. Gburski 77

### MD Study of the Endohedral Potassium Ion Fullerene Cluster ( $K^+@C_{60}$ )<sub>7</sub>

A. Piątek, A. Dawid, K. Górny, R. Nowak and Z. Gburski 81

### Molecular Dynamics Simulation Study of the Liquid Crystal Phase in a Small Mesogene Cluster (5CB)<sub>22</sub>

W. Gwizdała, A. Dawid and Z. Gburski 89

### Preparation and Characterization of Polymer/Multi-Walled Carbon Nanotube Nanocomposites

M.S. Mohlala and S.S. Ray 97

### Formation of Carbon Fibres in High-Voltage Low-Current Electrical Discharges

A.T. Sobczyk, A. Jaworek, E. Rajch and M. Sozańska 103

### A Titanium-Decorated Fullerene Cluster – A Molecular Dynamics Simulation

A. Piątek, R. Nowak and Z. Gburski 109

## Nanostructures for Medicine

<b>Nanotechnology for Treating Damaged Organs</b> J. Lu and T.J. Webster	119
<b>Electrospray Nanocoating of Microfibres</b> A. Jaworek, A. Krupa, A.T. Sobczyk, M. Lackowski, T. Czech, S. Ramakrishna, S. Sundarajan and D. Pliszka	127
<b>Nanomaterials in Dental Applications</b> M. Lewandowska, J. Siejka-Kulczyk, M. Andrzejczuk and K.J. Kurzydlowski	133
<b>The Influence of Graphene Sheet on the Dynamics of Cholesterol Molecules in the Lodgment Located near a Transmembrane Protein – MD Study</b> P. Raczynski, A. Dawid and Z. Gburski	141
<b>Computer Simulation of the Dynamics of Homocysteine Molecules Surrounding a Carbon Nanotube</b> P. Raczynski, A. Dawid, Z. Dendzik and Z. Gburski	147
<b>Dielectric Relaxation of a Cholesterol Domain Near a Graphite Wall - A Computer Simulation</b> P. Raczynski and Z. Gburski	153

## Bulk Metal Nanostructures

<b>The Mechanical Properties of Nano-TiO<sub>2</sub> Dispersed Al<sub>65</sub>Cu<sub>20</sub>Ti<sub>15</sub> Amorphous/Nanocrystalline Matrix Bulk Composite Prepared by Mechanical Alloying and High Pressure Sintering</b> D. Roy, R. Mitra, T. Chudoba, Z. Witczak, W. Łojkowski, H.J. Fecht and I. Manna	161
<b>Enhanced Fatigue Properties of Ultrafine-Grained Titanium Rods Produced Using Severe Plastic Deformation</b> I.P. Semenova, G.K. Salimgareeva, V.V. Latysh and R. Valiev	167
<b>Nanostructure Formation in Austenitic Stainless Steel</b> A.T. Krawczynska, M. Lewandowska and K.J. Kurzydlowski	173
<b>Nanoscale Nickel-Free Austenitic Stainless Steel</b> M. Tulinski, K. Jurczyk and M. Jurczyk	179
<b>The Effect of Grain Size Distribution on the Mechanical Properties of Nanometals</b> T.B. Tengen, T. Wejrzanowski, R. Iwankiewicz and K.J. Kurzydlowski	185
<b>The Influence of the Initial State on Microstructure and Mechanical Properties of Hydrostatically Extruded Titanium</b> K. Topolski, H. Garbacz, W. Pachla and K.J. Kurzydlowski	191
<b>Influence of Hydrostatic Extrusion Parameters on the Microstructure and Mechanical Properties of 6082 Aluminium Alloy</b> P. Widlicki, P. Wiecinski, H. Garbacz and K.J. Kurzydlowski	197

## Additional Oral Presentations