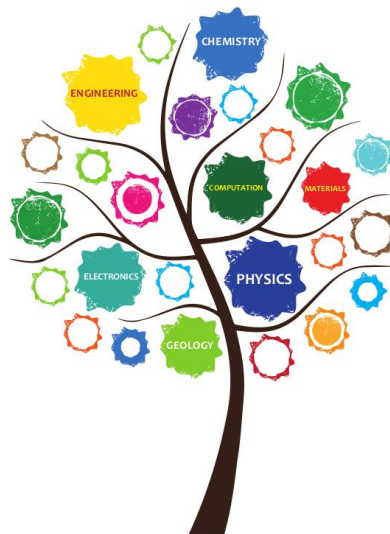




## Book of Abstracts

28 - 30 June 2023, Zagreb, Croatia





# Solid-State Science & Research Zagreb, 28 - 30 June 2023



## BOOK OF ABSTRACTS AND PROGRAMME

**Edited and prepared by:**

Nikola Biliškov  
Bahar Karadeniz  
Natalija Pantalon Juraj

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# SOLID-STATE SCIENCE & RESEARCH 2023

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**TABLE OF CONTENTS**

**Programme ..... 10**

**Keynote lectures ..... 15**

**Invited lectures ..... 21**

**Junior invited lectures ..... 37**

**Oral presentations ..... 47**

**Poster presentations ..... 73**

**Presenting author index ..... 137**

## Meeting programme:

All times are in CEST (GMT+2)

### Wednesday, June 28

08:00-08:45	<b>Registration</b>	
08:45-09:00	<b>Opening Ceremony</b>	
<b>Session 1</b>		
09:00-10:00	<b>Selvan Demir (Keynote speaker)</b> , Michigan State University, USA <i>New Advances in High-Performance Single-Molecule Magnets</i>	K03
10:00-10:30	<b>Danielle Laurencin</b> , Institute Charles Gerhardt, France <i>Isotopic labeling: a valuable approach for studying reaction mechanisms in ball-milling</i>	I01
10:30-10:45	<b>Stefanie Hutsch</b> , Ruhr-University Bochum, Germany <i>Mechanochemistry as Tool for Porous Organic Polymer Synthesis</i>	O1
10:45-11:00	<b>Nikola Biliškov</b> , Ruđer Bošković Institute, Croatia <i>Mechanochemical preparation of Ruddlesden-Popper type perovskites</i>	O2

### Coffee break

<b>Session 2</b>		
11:30 - 12:00	<b>Vlado Lazarov</b> , University of York, UK <i>Correlation between disorder and defects in half metals and topological insulators and their functional properties</i>	I02
12:00-12:15	<b>Željana Bonačić Lošić</b> , Faculty of Science, University of Split <i>Plasmon in topological nodal line semimetal</i>	O3
12:15-12:30	<b>Priyanka Reddy</b> , Department of Physics, Faculty of Science, University of Zagreb <i>Novel electronic materials on the verge of metallicity and ionicity</i>	O5
12:30-12:45	<b>Matija Čulo</b> , Institute of Physics, Zagreb <i>Quantum vortex liquid in iron-based superconductors FeSe<sub>1-x</sub>S<sub>x</sub> and FeSe<sub>1-x</sub>Tex</i>	O6

### Lunch break

<b>Session 3</b>		
14:00-14:30	<b>Antonio Šiber</b> , Institute of Physics, Zagreb <i>Mechanical design and infolding of pollen grains</i>	I03
14:30-14:45	<b>Monika Kovačević</b> , Faculty of Food Technology and Biotechnology, University of Zagreb <i>Overview of ferrocene peptidomimetics – conformational analysis, DFT study and solid state</i>	J11
14:45-15:00	<b>Ivor Lončarić</b> , Ruđer Bošković Institute, Croatia <i>Thermomechanical Properties of Molecular Crystals from Machine Learning Potentials</i>	O7
15:00-15:30	<b>Luka Pavić</b> , Ruđer Bošković Institute, Zagreb <i>Investigation of Oxide Glass-(Ceramics) Employing Impedance Spectroscopy</i>	I09
15:30-15:45	<b>Luca Grisanti</b> , Materials Foundry Institute (IOM) at National Research Council, Trieste, Italy <i>Base-pairing of uracil and 2,6-diaminopurine: from cocrystals to photoreactivity</i>	O8
15:45-16:00	<b>Laura Nuić</b> , Department of Chemistry, Faculty of Science, University of Zagreb <i>Polymerization of aromatic C-nitroso derivatives on Au(111) surface: ellipsometry, AFM and nano-FTIR study</i>	O9

### Coffee break – AlphaChrom presentation

<b>Session 4</b>		
16:30-16:45	<b>Ivana Ban</b> , Faculty of Science, University of Zagreb <i>Macro-karyotype model for tumor evolution</i>	J12
16:45-17:00	<b>Jasna Alić</b> , Ruđer Bošković Institute, Croatia <i>Direct in situ measurement of polymorphic transition temperatures in thermo-mechanochemical reactions</i>	J13
17:00-17:15	<b>Miriam Velasquez Hernandez</b> , Graz University of Technology, Austria <i>Resist-free micropatterning of oriented MOF films with anisotropic optical properties</i>	J14
17:15-17:30	<b>Simon Renner</b> , Graz University of Technology, Austria <i>Extending the scope of protein encapsulation into ZIFs</i>	O10
17:30-17:45	<b>Davide Benedetto Tiz</b> , National Institute of Chemistry, Ljubljana, Slovenia <i>Lignin-based covalent adaptable networks (CANs): a possible replacement for fossil-based thermosets</i>	O11
17:45-18:00	<b>Aleksandra Pacanowska</b> , Institute of Nuclear Physics Polish Academy of Sciences, Poland <i>From thin film deposition to composite materials of switchable coordination compound</i>	O12
18:00-20:00	<b>Poster session (P01-P30)</b>	

All times are in CEST (GMT+2)

### Thursday, June 29

08:00-09:00	<b>Registration</b>	
<b>Session 5</b>		
09:00 - 10:00	<b>Alessandro Stroppa (Keynote speaker)</b> , Consiglio Nazionale delle Ricerche, Institute for Superconducting and Innovative Materials and Devices, (CNR-SPIN), Italy <i>Can we generate and transfer chirality?</i>	K02
10:00 - 10:30	<b>Denys Makarov</b> , Helmholtz-Zentrum Dresden-Rossendorf, Germany <i>Designing chiral magnetic responses by tailoring geometry of thin films: curvilinear ferro- and antiferromagnets</i>	I05
10:30-10:45	<b>Krešimir Molčanov</b> , Ruđer Bošković Institute, Croatia <i><math>\pi</math>-hole interactions: a new playground for materials science</i>	O13
10:45-11:00	<b>Sharmarke Mohamed</b> , Khalifa University of Science and Technology, UAE <i>On the crystal engineering of mechanically responsive crystals using facet-dependent DFT Young's moduli</i>	O14

### Coffee break

<b>Session 6</b>		
11:30 - 11:45	<b>Nea Baus Topić</b> , Faculty of Science, Department of Chemistry, University of Zagreb <i>Cocrystals with copper(II) complexes as halogen bond donors</i>	J15
11:45 - 12:00	<b>Katarina Lisac</b> , Ruđer Bošković Institute, Croatia <i>Monometallic and bimetallic MOF-74 materials based on structural isomers as linkers</i>	J16
12:00 - 12:15	<b>Mihails Arhangel'skis</b> , University of Warsaw, Poland <i>Ab initio prediction of structures, functional properties and solid-state reactivity of crystalline materials</i>	O15
12:15-12:30	<b>Mateja Pisačić</b> , Faculty of Science, Department of Chemistry, University of Zagreb <i>Dancing crystals - mechanically and thermally stimulated crystal movements</i>	O16
12:30-12:45	<b>Nick Vukotić</b> , University of Windsor, Canada <i>Therapeutic Coordination Polymers (TCPs) as Controllable Drug Release Materials</i>	O17
12:45-13:00	<b>Francesco Carraro</b> , Graz University of Technology, Austria <i>Hydrogen-bonded organic frameworks and enzymes: a new class of biocomposites</i>	O18

### Lunch break

<b>Session 7</b>		
14:00-14:30	<b>Marija Milanović</b> , University of Novi Sad, Serbia <i>Epitaxial La<sub>1-x</sub>Sr<sub>x</sub>MnO<sub>3</sub> thin films obtained by PAD – influence of temperature and Sr concentration</i>	I06
14:30-15:00	<b>Martina Lihter</b> , Institute of Physics, Zagreb <i>Nanofabrication, Functionalization and Applications of Atomically Thin 2D Materials</i>	I07
15:00-15:15	<b>Wojciech Sas</b> , Institute of Physics, Zagreb <i>Various strategies of synthesizing Prussian blue analogs of mixed composition into reduced dimensionality systems</i>	O19
15:15-15:30	<b>Igor Milanović</b> , Vinča Institute of Nuclear Sciences, Serbia <i>(Bi)metallic amidoboranes – synthesis, characterisation and perspective</i>	O20
15:30-15:45	<b>Wojciech Wegner</b> , University of Warsaw, Poland <i>Versatile usage of the complex hydride materials</i>	O21
15:45-16:00	<b>Matic Lozinšek</b> , Jožef Stefan Institute, Slovenia <i>Alkali-Metal Fluoridooxidovanadates(V)</i>	O22

**Coffee break – Jasika presentation**

<b>Session 8</b>		
16:30-17:00	<b>Jonathan De Roo</b> , University of Basel, Switzerland <i>Pair Distribution Function analysis of metal oxide nanocrystals and metal oxo clusters</i>	I08
17:00-17:30	<b>Davor Ljubas</b> , Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb <i>Creation of magnetic photocatalysts for degradation of water pollutants</i>	I04
17:30-17:45	<b>Mercedes Linares-Moreau</b> , Graz University of Technology, Austria <i>Fabrication of 3D-oriented MOF films and patterns from oriented ceramic nanostructures</i>	O23
17:45-18:00	<b>Photo session (Main entrance)</b>	
18:00-20:00	<b>Poster session (P31-P63)</b>	

All times are in CEST (GMT+2)

### Friday, June 30

09:00-13:00	<b>Zagreb City Tour-Lunch break</b>	
<b>Session 9</b>		
13:00-14:00	<b>James Mack (Keynote speaker)</b> , University of Cincinnati, USA <i>Mechanochemistry is just chemistry</i>	K01
14:00-14:30	<b>Alexey Popov</b> , Leibniz IFW Dresden, Germany <i>Molecular magnets with single-electron bond between rare-earth metals</i>	I10
14:30-14:45	<b>Ana Najev</b> , University of Zagreb, Croatia <i>Probing the electronic properties of titanates with NMR and ESR</i>	J17
14:45-15:00	<b>Jedrzej Kobylarczyk</b> , Institute of Nuclear Physics Polish Academy of Sciences, Poland <i>Site Selective Spin Crossover in Large Undecanuclear Cyanido-Bridged Clusters</i>	O24

### Coffee break

<b>Session 10</b>		
15:30-16:00	<b>Andrej Zorko</b> , Jožef Stefan Institute and Faculty of Mathematics and Physics, University of Ljubljana, Slovenia <i>Spin liquids on the triangular spin lattice</i>	I11
16:00-16:30	<b>Mirela Dragomir</b> , Jožef Stefan Institute, Slovenia <i>Synthesis, crystal growth, and characterisation of frustrated magnets and other quantum materials</i>	I12
16:30-17:00	<b>Ivica Živković</b> , EPFL, Switzerland <i>Entropy chase in 5d1 double perovskites</i>	I13
17:00-17:15	<b>Pavla Šenjuga</b> , Faculty of Science, Department of Physics, University of Zagreb <i>Magnetism and magnetic order in layered hybrid organic-inorganic tetrahalocuprate perovskites</i>	J18

### Closing ceremony and awards

### P43 - Pyrophyllite modified carbon-based electrode

*J. Grbović Novaković, A. Mitrović Rajić, T. Pantić, S. Milošević Govedarović,  
N. Novaković, J. Rmuš Mravik B. Paskaš Mamula*

<sup>1</sup>Centre of Excellence for Hydrogen and Renewable Energy, Vinča Institute of Nuclear Sciences, National Institute of Republic of Serbia, University of Belgrade, Belgrade, POB 522, Serbia  
e-mail: jasnag@vinca.rs

The main goal is to develop electrode material for the detection of traces of pesticides in food and water in a wide range of pH values. The leading idea is to use natural clay **pyrophyllite to modify carbon paste electrode**. SPEX Mixer/Mill 5100 is used for mechanochemical modification. The changes in the structure of pyrophyllite before and after the grinding process were studied by means of PSD, XRD, FTIR, and DTA-TG [1]. The electrochemical behavior of the sensor was followed using differential pulse stripping voltammetry (DPSV). It is shown that obtained material can be used as electrodes in electrochemical sensors for pesticide detection in a wide range of pH.

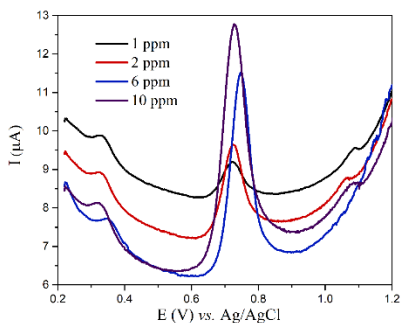


Figure 1 DPSV in Britton – Robinson buffer at pH 8

[1] A. Mitrović Rajić, T. Pantić, S. Milošević Govedarović, B. Paskaš Mamula, N. Filipović, J. Grbović Novaković, S. Dimitrijević, *Sci. Sinter.* DOI: 10.2298/SOS220715018M, (2023)