

Program - Monday, 5th September, 2022

8:45 - 9:00 **Opening Ceremony**

9:00 - 10:00 **Plenary Lecture 1**

Chair: **Stefan Klotz** (IMPMC, Sorbonne University, France)

Speaker: **Mohamed Mezouar** (ESRF, France)

ID27-II: A new high flux nano-XRD/XRF/XRI beamline for science under extreme conditions

10:00 - 12:30 New techniques at large scale facilities like synchrotrons and neutron high pressure facilities and shock wave experiments

10:00 - 10:30 **Frederico Alabarse** (Elettra Sincrotrone Trieste, Italy)

New possibilities at the high pressure diffraction beamline from the Elettra Synchrotron Facility

10:30 - 11:00 **Nicholas Funnell** (UKRI – ISIS Neutron and Muon Facility, UK)

Neutron total scattering measurements under hydrostatic pressure

11:00 - 11:30 **Coffee Break**

11:30 - 11:45 **Karen Appel** (European XFEL)

Dynamic compression of (MgxFe1-x)O to Megabar pressures

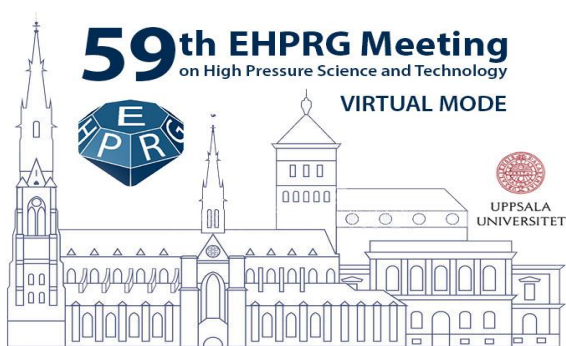
11:45 - 12:00 **Robert Farla** (Deutsches Elektronen-Synchrotron DESY, Germany)

New capabilities for high-pressure experiments at the Large Volume Press end-station P61B

12:00 - 12:30 **Komatsu Kazuki** (The University of Tokyo, Japan)

Recent progress in neutron diffraction studies for ice VII

12:30 - 13:30 **Lunch Break**



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13:30 - 14:30 **Plenary Lecture 2**

Chair: **A. Muñoz González**, (*Universidad de La Laguna, Tenerife, Spain*)

Speaker: **Alberto Otero de la Roza** (*University of Oviedo, Spain*)

Chemical diversity in simple systems under compression

14:30 - 15:30 Theoretical prediction of high pressure phases and deep/machine learning approach for extreme conditions - I

14:30 -14:45 **Alvaro Lobato** (*Universidad Complutense de Madrid, Spain*)

Chemical Pressure and Physical Pressure: beyond atomic radii

14:45 -15:00 **Raghunandan Pratoori** (*Iowa State University, USA*)

Scale-Free Phase-Field Modeling of Multivariant Martensitic Phase Transformation in Single and Polycrystalline Zirconium and Silicon under Non-hydrostatic Loading

15:00 -15:15 **Dominik Kurzydłowski** (*Cardinal Stefan Wyszyński University, Poland*)

Potential energy barrier for proton transfer in compressed benzoic acid

15:15 – 15.30 **Yipeng Peng** (*Iowa State University, USA*)

Effect of a Micro-scale Dislocation Pileup on the Atomic-Scale Multi-variant Phase Transformation and Twinning

15:30 - 16:00 Coffee Break

Chair: **J. Contreras-García**, (*Université P&M Curie, Paris, France*)

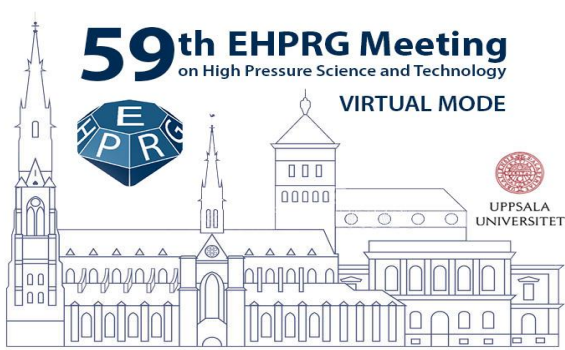
16:00 – 16.30 **Andreas Hermann** (*University of Edinburgh, UK*)

Potassium from first principles: A case study

16:30 – 16.45 **Madhavi Dalsaniya** (*Cardinal Stefan Wyszyński University, Poland*)

Insights into the high-pressure behaviour of solid bromine from hybrid DFT calculations

16:45 – 17.00 **V. Maurya** (*Mohanlal Sukhadia University, Udaipur, India*)



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The Structural Phase Transitions in β , Rutile & Fluorite Crystals of NbO₂

17:00 – 17.15 **Achyut Dhar** (Iowa State University, USA)

Tensorial stress-plastic strain fields in α - ω Zr mixture, revised phase transformation kinetics, and friction under compression in diamond anvil cell: Coupled Experimental-Analytical-Numerical Approach

17:15 – 17.30 **Yana Propad** (Moscow Institute of Physics and Technology, Russia)

Random structure generator with fixed environment

17:30- 18:00 Poster Session-I

Zeliang Liu (Yanshan University, China)

PdH₂ nanotube: A potential design

Placida Rodriguez-Hernandez (Universidad de La Laguna)

High-pressure elastic, vibrational and structural study of monazite-type EuPO₄ from ab initio simulations.

Alfonso Munoz (Universidad de La Laguna, Spain)

Ab Initio study of Ca₃Y₂Ge₃O₁₂ garnet. Dynamical, elastic properties and mechanical stability under pressure

Giovani Rech (Universidade de Caxias do Sul, Brazil)

Pressure-induced phase transition of fluorine

Maxime Bonsir (Université Libre de Bruxelles (ULB), Belgium)

Tailored Adamantane derivatives as precursors to Nanodiamonds in mild Pressure and Temperature conditions

Olga Ibragimova (Florida International University, USA)

The behavior of simple molecule of bromine under high pressure high temperature conditions



Program - Tuesday, 6th September, 2022

9:00 - 10:00 **Plenary Lecture 3**

Chair: **Andrzej Katrusiak** (Adam Mickiewicz University, Poland)

Speaker **Mikhail Eremets** (Max Planck Institute for Chemistry, Germany)

High temperature superconductivity in superhydrides

10:00 - 12:30 Superconductivity and hydrogen rich materials under high pressure: experiment and theory-I

10:00 - 10:30 **Boby Joseph** (Elettra-Sincrotrone Trieste, Italy)

Pressure-enhanced superconductivity in some of the cage-type quasiskuttrudite single crystals

10:30 - 11:00 **Changqing JIN** (IOP, CAS), China

New High T_c Superconductors Achieved via High Pressures

11:00 - 11:30 **Coffee Break**

Chair: **Jaeyong Kim** (Hanyang University, Korea)

11:30 -11:45 **Reina Utsumi** (National Institutes for Quantum Science and Technology, USA)

Search for guidelines for synthesizing low hydrogen affinity alloy hydrides

11:45 -12:00 **J. Contreras-García**, (Université P&M Curie, Paris, France)

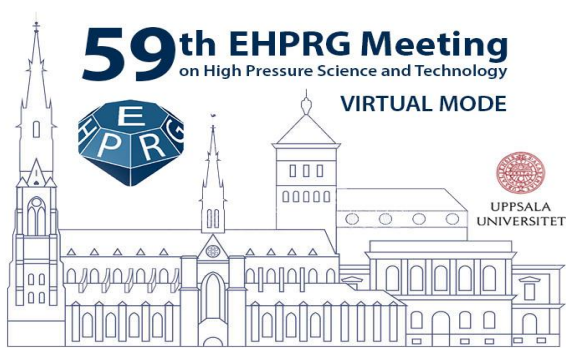
Engineering better superconductors: two-electron models of superconductivity in real space

12:00 -12:15 **Sam Cross** (University of Bristol, UK)

Clean-limit superconductivity at 197 K in high-pressure sulfur hydride synthesised using ammonia borane

12:15 -12:30 **Yehezkeiel Amiel** (Tel Aviv University, Israel)

Superconducting properties of AuAgTe₄ under pressure



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12:30 - 13:30 **Lunch Break**

13:30 - 14:30 Superconductivity and hydrogen rich materials under high pressure: experiment and theory-II

*Chair: **Changqing JIN** (IOP, CAS), China*

13.30-14.00 **Siddharth S Saxena** (Cambridge, UK)

Pressure Induced Emergent Electronic, Magnetic and Structural Phases in Van der Waals Systems

14:00 -14:15 **Maelie CAUSSE** (CEA, France)

Superionicity of H- in LaH10 superhydride

14:15 -14:30 **Bar Hen** (Tel Aviv University, Israel)

Superconductor-insulator transitions in three-dimensional indium-oxide at high pressures

14:30 - 15:00 **Coffee Break**

*Chair: **Siddharth S Saxena** (Cambridge, UK)*

15:00 - 15:30 **Jaeyong Kim** (Hanyang University, Korea)

Structures and Transport Properties of TiZr Alloys with Hydrogen under High Pressure

15:30 - 15:45 **Yan Wu** (Oak Ridge National Laboratory, USA)

High pressure neutron study on magnetic phases in a Y-type hexaferrite

15:45 - 16:00 **Elissaios Stavrou** (Guangdong Technion - Israel Institute of Technology, Israel)

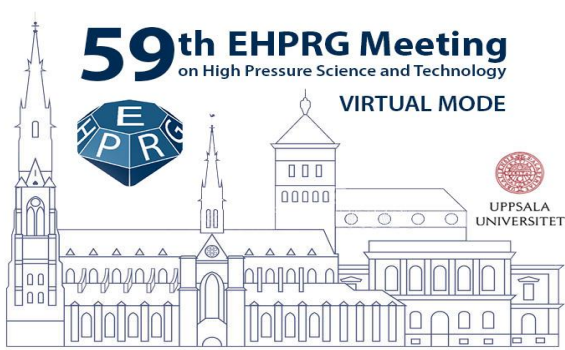
Raman study of pure TeO₂ glass under pressure: interplay between glass network transformations and electronic transitions

16:00 - 16:30 **Tomohiro Takayama** (Max Planck Institute for Solid State Research, Germany)

Pressure-induced electronic phase transitions in honeycomb-based transition-metal compounds

16:30 - 16:45 **Azkar Saeed Ahmed** (Guangdong Technion-Israel Institute of Technology, China)

Pressure-driven switching of magnetism in layered CrCl₃



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16:45 - 17:00 **Lena Bussmann** (TU Bergakademie Freiberg, Germany)

Combined X-ray Raman Scattering Spectroscopy and X-Ray Diffraction on Shock-Compressed Vitreous SiO₂

17:00 - 17:15 **Gabriel Pristas** (Institute of Experimental Physics, Slovak Academy of Sciences, Slovak)

INFLUENCE OF PRESSURE AND THICKNESS ON SUPERCONDUCTIVITY IN HIGH ENTROPY ALLOYS THIN FILMS

17:15 - 17:30 **Igor Danilov** (Institute for High Pressure Physics, Russian Academy of Sciences, Russia)

Order-disorder phase transitions in 1-bromadamantane and 1-chloroadamantane

17:30- 18:00 Poster Session-II

Joao Elias RODRIGUES (European Synchrotron Radiation Facility)

Revealing the mechanisms of the pressure-induced insulator-metal transition in distorted TiNiO₃ perovskites

Jiří Kaštil (FZU AV ČR, Czech)

New type of uniaxial non-magnetic pressure cell

J. Manuel Recio (Universidad de Oviedo, Spain)

Computational Prediction of Planetary Composition from Mass/Radius Data

David J Dunstan (Queen Mary University of London, UK)

Optimised Spectrum Fitting using Likelihood and Bayes Factor: Carbon Nanotubes under Pressure

Javier Gonzalez-Platas (Universidad de La Laguna)

Structural behavior of Copper(I) halide luminescence compounds under High Pressure

Igor Danilov (Institute for High Pressure Physics, Russian Academy of Sciences)

Elastic properties of dipropylene glycol glasses with different thermobaric histories

Talha ZAFER. (Sakarya University, Sakarya, Turkey)

Pressure-Induced Superconductivity in LaRhP



Program - Wednesday, 7th September, 2022

9:00 - 10:00 **Plenary Lecture 4**

Chair: **Julien Haines** (CNRS, France)

Speaker: **Andrzej Katrusiak** (Adam Mickiewicz University, Poland)

Compressibility of chemical compounds

10:00 - 12:30 High pressure mineral physics, chemistry and geochemistry

10:00 – 10:15 **Thomas Meier** (Center for High Pressure Science & Technology Advanced Research)

Universal Hydrogen Bond Symmetrisation Dynamics under extreme Conditions

10:15 – 10:30 **Mael Guennou** (University of Luxembourg)

Stability of the tetragonal phase of BaZrO₃ under high pressure

10:30 – 10:45 **Matteo Ceppatelli** (ICCOM-CNR and LENS)

High-pressure and high-temperature chemistry of phosphorus and nitrogen: synthesis and characterization of α - and γ -P₃N₅

10:45 – 11:00 **Caroline Bollinger** (IRAP)

Acoustic wave velocities in Mars' mantle minerals

11:00 - 11:30 **Coffee Break**

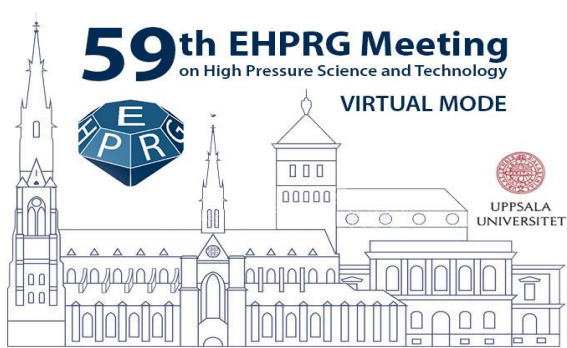
Chair: **Thomas Meier** (Center for High Pressure Science & Technology Advanced Research)

11:30 – 12:00 **Stefan Klotz** (IMPIC, Sorbonne University, France)

High-pressure polymerisation of CS₂ : “Bridgman’s black” revisited

12:00 – 12:15 **Simon Ayirinhac** (IMPIC, Sorbonne Université, Paris, France)

Melting curve of indium at high pressure measured by picosecond acoustics



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12:15 – 12:30 **Umbertoluca Ranieri** (Università di Roma La Sapienza)

Formation and stability of dense methane-hydrogen compounds

12:30 – 12:45 **Samuel Gallego Parra** (Universidad Politecnica de Valencia)

Synthesis of van der Waals Ga₂S₃ structures under high pressure

12:45 - 13:45 **Lunch Break**

*Chair: **Tomohiro Takayama** (Max Planck Institute for Solid State Research, Germany)*

13:45-14:45 **High pressure spectroscopy and instrumentation including ultra-high pressure generation**

13:45-14:00 **Alexis Forestier** (CEA, France)

VIPA-based Brillouin spectroscopy: a new tool for exploring the thermodynamics of warm dense molecular system

14:00-14:15 **Marina Candela** (Universidad de Cantabria)

High-pressure behavior of monoclinic (Eu_{1-x}Ybx)₂O₃ solid solution: a spectroscopic study

14:15 - 14:30 **Camino Martín-Sánchez** (University of Cantabria)

Correlation between spectroscopic and mechanical properties of gold nanocrystals under pressure

14:30 - 14:45 **Janaky Sunil** (JNCASR, Bangalore)

High Pressure Topological transition of 1T-TiSe₂

14:45 - 15:45 Food science and technologies, High pressure life and biosciences

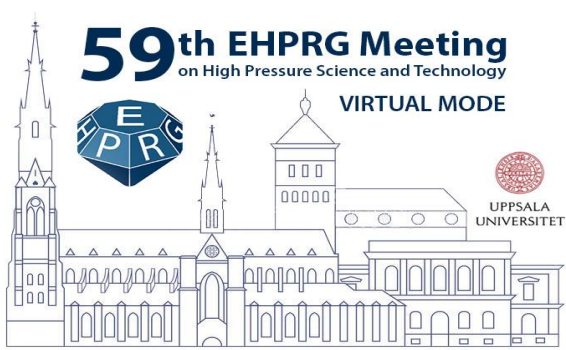
*Chair: **Jorge Saraiva** (Universidade de Aveiro)*

14:45 - 15:00 **Jorge Saraiva** (Universidade de Aveiro)

Moderate Pressure Pasteurisation at Room Temperature on endogenous and inoculated microorganisms of fish soup as a novel nonthermal food pasteurisation methodology

15:00 - 15:15 **Carlos Pinto** (Universidade de Aveiro)

Germination and inactivation of *Byssoschlamys nivea* ascospores under hyperbaric storage - dependence on thermal and nonthermal pre-activation steps



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15:15 - 15:30 **Judith Peters** (Univ. Grenoble Alpes)

Unravelling the mechanisms of adaptation to high pressure in proteins

15:30 - 15:45 **Hao Yan** (University of North Texas)

High-pressure conformational changes of phospholipids

15:45 - 16:05 **Coffee Break**

*Chair: **A. Muñoz González**, (Universidad de La Laguna, Tenerife, Spain)*

16:05 - 16:45 **EHPRG Award Lecture**

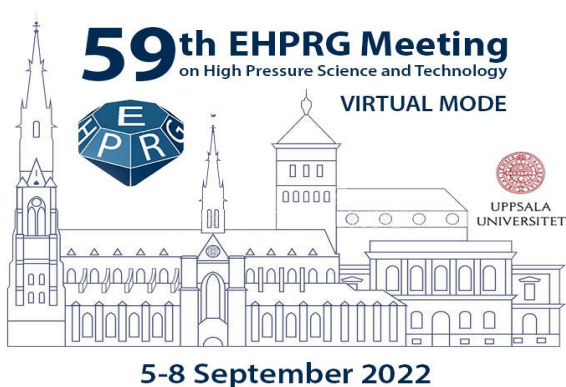
16:05 - 16:15 **Introduction about EHPRG Award & Recipient**

16:15 - 16:45 **Silvia Boccato** (Centre national de la recherche scientifique, France)

Multi-technical methodological approaches for the study of liquids under extreme conditions of pressure and temperature

*Chair: **A. Muñoz González & J. Contreras-García***

16:45 - 18:00 **General Assembly of EHPRG**



Program - Thursday, 8th September, 2022

Chair: **Changqing JIN** (*Institute of Physics Chinese Academy of Sciences*)

9:00 - 11:00 **Energy materials under high pressure: experiment and theory**

9:00 – 9:30 **Shigeyuki Takagi** (*Institute for Materials Research, Tohoku University, Japan*)

Room-temperature superionic conduction in complex transition metal hydrides with high hydrogen coordination

9:30 – 9:45 **Hiroyuki Saitoh** (*National Institutes for Quantum Science and Technology*)

High-pressure synthesis of aluminum-iron alloy hydride

9:45 – 10:00 **Daniel Errandonea** (*Universidad de Valencia*)

The rich structural landscape induced by pressure in multifunctional FeVO_4

10:00 – 10:15 **Jerome Rouquette** (*ICGM, Univ. Montpellier, Montpellier, France*)

Interplay between proton dynamics and Fe valence fluctuation in $\text{Fe}_3(\text{PO}_4)_2(\text{OH})_2$

10:15 – 10:30 **AKUN LIANG** (*Universitat de València*)

General relationship between the bandgap energy and iodine-oxygen bond distance in metal iodates

10:30 – 10:45 **DEBABRATA SAMANTA** (*Indian Institute of Science Education and Research Kolkata*)

Pressure induced emission enhancement and bandgap narrowing: experimental investigations and first principles theoretical simulations on the model halide perovskite $\text{Cs}_3\text{Sb}_2\text{Br}_9$

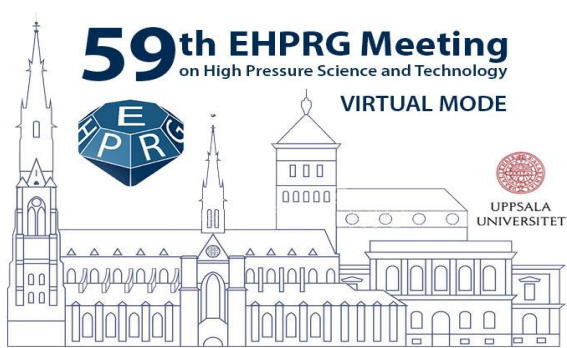
10:45 – 11:00 **Raktima Basu** (*Indian Institute of Science Education and Research Kolkata, India*)

Pressure Driven Phase Transition in NdNiO_3 Nanostructures

11:00 - 11:30 **Coffee Break**

Chair: **Daniel Errandonea** (*Universidad de Valencia*)

11:30 – 12 :30 **High pressure studies of Materials -I**



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11:30 – 11 :45 **Julien Haines** (CNRS, France)

Preparation of Confined, Low-Dimensional Boron Nitride in the 1-D Pores of Siliceous Zeolites under High Pressure, High Temperature Conditions

11:45 – 12:00 **Valery Levitas** (Iowa State University, Ames, IA, USA)

Resolving puzzles of the deep-focus earthquake mechanism based on plastic strain-induced olivine-spinel transformation and transformation-induced plasticity

12:00 – 12 :15 **Krzysztof Woźniak** (University of Warsaw)

ACCURATE CRYSTAL STRUCTURE OF ICE VI FROM X-RAY DIFFRACTION WITH HAR

12:15 – 12 :30 **Feng Lin** (Department of Aerospace Engineering, Iowa State University, USA)

Rough diamond anvil: Critical microstructure, pressure-dependent yield surface of perfect plasticity, record low pressure for strain-induced α - ω transformation in Zr, and combined strain and time-controlled kinetics

12:30 - 13:30 **Lunch Break**

*Chair: **J. Manuel Recio** (Universidad de Oviedo)*

13:30 - 15:00 **Interdisciplinary area in high-pressure science and technology**

13:30 – 14:00 **Valery Levitas** (Iowa State University, Ames, IA, USA)

Strain-Induced Phase Transformations under High Pressure: Four-Scale Theory, Experiments, and Phenomena

14:00 – 14:15 **Miriam Klippel** (Federal University of Espirito Santo – Brazil)

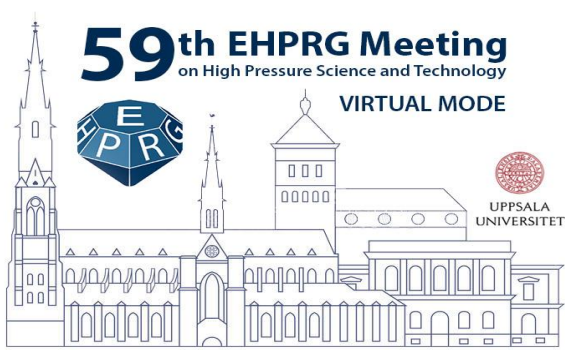
An exploratory study of polymeric matter under high pressure

14:15 – 14:30 **Rosario Vilaplana** (Universitat Politècnica de València)

Experimental and theoretical study of β -As₂Te₃ under hydrostatic pressure

14:30 – 14:45 **Krishan Kumar Pandey** (Bhabha Atomic Research Centre, India)

Kinetics of plastic strain induced $\alpha \rightarrow \omega$ phase transition in Zr_{2.5}Nb alloy



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14:45 – 15:00 **Sorb Yesudhas** (Iowa State University, USA)

Record Low Transformation Pressure and New Phase Transformation Sequence in Nano-Si under Plastic Compression

15:00 - 15:30 **Coffee Break**

*Chair: **Valery Levitas** (Iowa State University, Ames, IA, USA)*

15:30 - 15:00 **High pressure studies of Materials –II**

15:30 - 15:45 **Elena Stellino** (University of Perugia)

Far Infrared Study of Pressure-Tunable Fano Resonance and Metallization Transition in semiconducting Transition Metal Dichalcogenides

15:45-16:00 **Patrick Rosa** (ICMCB, CNRS-Université de Bordeaux-Bordeaux INP)

Understanding the behaviour of spin crossover materials for barocaloric applications: (P,T) phase diagrams

16:00-16:15 **Caoping Niu** (University of Science and Technology of China, Hefei, China)

Boron and Nitrogen Dopants Enhanced Stability of Diamane Induced by High Pressure

16:15 - 16:30 **Niki Sorogas** (Aristotle University of Thessaloniki)

High pressure Raman study of ternary tin dichalcogenides, $\text{SnS}_x\text{Se}_{2-x}$

16:30 - 16:45 **Bishnupada Ghosh** (Indian Institute of Science Education and Research Kolkata)

Structural and electronic phase transitions in $\text{Zr}_{1.03}\text{Se}_2$ at high pressure

16:45 - 17:00 **Sorb Yesudhas** (Iowa State University, USA)

Evidence of Si-II to Si-I reversible phase transformation and retaining of Si-II under ambient pressure after plastic shear under pressure

17:00 – 17:15 **Krishan Kumar Pandey** (Bhabha Atomic Research Centre, India)

Microstructural evolution across $\alpha \rightarrow \omega$ phase transition in Zr under hydrostatic compression

17:15 – 17:30 **Closing Session**