

Conference Program

Conference Program (REI-21)

Monday, September 4, 2023

- 9:30 Opening *Kazuhiro Yasuda (Kyushu Univ.)*
Chair: N. Ishikawa (JAEA)
- Session Ma-1 Chair: W.J. Weber (Univ. of Tennessee)
- 9:50 I-01 Atomistic simulations of the exceptional radiation tolerance of polymorph-
rich Ga₂O₃ crystals *Flyura Djurabekova (Univ. of Helsinki, Finland)*
- 10:20 O-01 Supreme Radiation Tolerance of Ga₂O₃
Andrej Kuznetsov (Univ. of Oslo, Norway)
- 10:40 Coffee Break (30 min)
- Ma-2 Chair: F. Djurabekova (Univ. of Helsinki)
- 11:10 I-02 Irradiation and implantation effects in Ga₂O₃ materials and devices
Marco Peres (INESC MN, Portugal)
- 11:40 O-02 Lattice-site location of Mn in Mn-doped Sb₂Te₃ topological insulators
using MeV ion channeling *Eleni Ntemou (Uppsala Univ., Sweden)*
- 12:00 O-03 Efficacy of ion implantation in Pt for controllable enhancement of spin
Hall angle *Garima Vashisht (Kyushu Inst. of Tech., Japan)*
- 12:20 Lunch (80 min)
- Mp-1 Chair: A. Popov (Univ. of Latvia)
- 13:40 I-03 Color Centers in Diamond Fabricated by Ion and Electron beam for
Quantum Technologies *Shinobu Onoda (National Institutes for Quantum
Science and Technology, Japan)*
- 14:10 O-04 Understanding the effects of high energy ion irradiation in diamond for
quantum computing applications *Aleksi Leino (Univ. of Helsinki, Finland)*
- 14:30 O-05 Spatially Resolved Phonon Thermal Transport in Swift Heavy Ion
Irradiated Single Crystalline Insulators *Zhandos Utegulov (Nazarbayev Univ.,
Kazakhstan)*

14:50 O-06 Evolution of the radiation tolerance of partially stabilized (tetragonal) ZrO₂ under swift heavy ion irradiation *Jacques O'Connell (Nelson Mandela Univ., South Africa.)*

15:10 Coffee Break (20 min)

Mp-2 Chair: H. Amekura (NIMS)

15:30 I-04 Fine control of point defect creation in AlN by swift heavy ion irradiation for quantum application
Mamour Sall (CIMAP (CEA, CNRS, ENSICAEN, UCN), France)

16:00 O-07 Ag Ion Implanted Thin-film Lithium Niobate for Self-powered Photodetection *Feng Chen (Shandong Univ., China)*

16:20 O-08 Modification of embedded gold nanorods in SiO₂ by swift heavy ion irradiation *Spyridon Korkos (KTH Royal Inst. of Tech., Sweden, Univ. of Helsinki, Finland)*

Memorial session Chairs: K. Yasuda & N. Ishikawa

16:40 M-01 Memorial Session for the late Prof. Kurt Schwartz
Christina Trautmann (GSI Helmholtz Center, Germany)

(17:30 International Committee Meeting)

Tuesday, September 5, 2023

TUa-1 Chair: M. Ishimaru (Kyushu Inst. of Tech.)

9:00 **(Withdrawn)** I-05 Role of the ion track formation threshold in the nanostructuring of materials by swift heavy ion beams *Marko Karlušić (Ruđer Bošković Inst., Croatia)*

9:30 O-09 Atomic-scale kinetics of tracks of swift heavy ions under grazing incidence in CaF₂ *Ruslan Rymzhanov (Joint Inst. for Nuclear Research, Russia, The Inst. of Nuclear Physics, Kazakhstan)*

9:50 O-10 Surface Nanostructures and Formation Mechanism on TeO₂ induced by Swift Heavy Ions under Grazing Incidence *Pengfei Zhai (Inst. of Modern Physics, Chinese Academy of Sciences, China)*

10:10 O-11 Formation of X-type Phases in Binary and Ternary Oxides Irradiated with

Swift Heavy Ions *Cameron Tracy (Stanford Univ., USA)*

10:30 Coffee Break (20 min)

TUa-2 Chair: M. Lang (Univ. of Tennessee)

10:50 I-06 Investigation of damage accumulation in the nano-structured pyrochlore
Pawan Kulriya (Jawaharlal Nehru Univ., India)

11:20 O-12 Characterizing swift heavy ion-induced amorphous phases in complex
oxides *Cale Overstreet (Univ. of Tennessee, USA)*

11:40 O-13 Nanoparticles Size Effect on SHI Irradiation Stability of $Y_2Ti_2O_7$
*Anel Ibrayeva (Inst. of Nuclear Physics, Kazakhstan, Center for High Resolution
Transmission Electron Microscopy, South Africa)*

12:00 O-14 Superior radiation tolerance of rare-earth titanate pyrochlore with a high
entropy design at the A-cation site *Da Chen (Southeast Univ., China)*

12:20 Lunch (80 min)

TUp-1 Chair: M. Karlušić (Ruđer Bošković Inst.)

13:40 I-07 Comparison of synergistic and competitive effects in defective $KTaO_3$
*Gihan Velisa (Horia Hulubei National Inst. for Physics and Nuclear Engineering,
Romania)*

14:10 O-15 Swift Heavy Ion Modified Materials: Applications and Characterisation
using Synchrotron Small Angle X-ray Scattering
Patrick Kluth (Australian National Univ., Australia)

14:30 O-16 Unexpectedly Narrower Track Diameter Near Site of Fission Event
*Weixing Li (Inst. of Tibetan Plateau Research, Chinese Academy of Sciences,
China)*

14:50 O-17 Assessment of the Material Properties which Influence SHI Related
Disorder Dynamics in Several Insulators *Arno Janse van Vuuren (Nelson
Mandela Univ., South Africa)*

15:10 Coffee Break (20 min)

TUp-2 Chair: J.M. Costantini (Univ. Paris-Saclay)

15:30 I-08 Energy diagnostics of proton beams by color center luminescence imaging
in LiF crystals: empirical implementation of scattering-degraded fluence into an

- analytical energy-loss model *Enrico Nichelatti (ENEA C.R. Casaccia, Italy)*
- 16:00 PA-08 **(Transferred)** Structural Manipulation of Ceramic Materials via Extreme Conditions *Maik Lang (Univ. of Tennessee)*
- 16:20 PA-20 **(Transferred)** Defect Structure Investigation of Aluminate Spinel Induced by Swift Heavy Ion Irradiations
Satoru Yoshioka (Kyushu Univ., Japan)
- 16:40 O-20 Influence of Neutron Irradiation Parameter and Annealing Temperature on Neutron-Transmutation-Doped Heteroepitaxial GaN Film *Yueh-Chun Chung (National Tsing Hua Univ., Taiwan)*

- 17:00 Poster Session 1 (120 min)

Wednesday, September 6, 2023

- Wa-1 Chair: A. Gentils (Univ. Paris-Saclay)
- 9:00 I-09 Comprehensive treatment of the impact of irradiation defects on thermal transport in thorium dioxide *David Hurley (Idaho National Laboratory, USA)*
- 9:30 O-21 Evolution of extended defects in UO_2 : synergetic effect of nuclear and electronic energy losses *Arthur Georgesco (Univ. Paris-Saclay, CEA, France)*
- 9:50 O-22 Radiation Effects in High-Entropy Oxides
William Weber (Univ. of Tennessee, USA)
- 10:10 O-23 Distinctive Features of Thermal Annealing of Radiation Defects in Functional Materials for Fusion Applications *Anatoli Popov (Univ. of Latvia, Latvia)*

- 10:30 Coffee Break (20 min)

- Wa-2 Chair: Yugang Wang (Peking Univ.)
- 10:50 I-10 Behavior of ceramics submitted to ion beams characterized using in situ experimental techniques: case of apatite
Aurelie Gentils (Univ. Paris-Saclay, France)
- 11:20 O-24 Correlation Between Microstructure Evolution and Mechanical Degradation of SiC/SiC Under Ion Irradiation: An in-situ TEM study
Ce Zheng (Northwestern Polytechnical Univ., China)
- 11:40 O-25 Microstructural Stability of Irradiated SiC

Sosuke Kondo (Tohoku Univ., Japan)

12:00 Lunch, Excursion, and Banquet

Thursday, September 7, 2023

THa-1 Chair: C. Trautmann (GSI Helmholtz Center)

9:00 I-11 Annealing of swift heavy ion tracks in amorphous silicon dioxide

Shankar Dutt (Australian National Univ., Australia)

9:30 O-26 Self-Trapped Exciton Kinetics and Defect Production Routes in Silica Irradiated with Light and Heavy Ions *Joseph Graham (Missouri Univ. of Science and Tech., USA)*

9:50 O-27 Evaluation of mechanical property of ultra-thin SiN_x membranes irradiated by gas cluster ion beam *Masaya Takeuchi (Univ. of Hyogo, Japan)*

10:10 O-28 Ion irradiation effects on electrical properties of 4H-SiC schottky barrier diodes *Jianrong Sun (Inst. of Modern Physics, Chinese Academy of Sciences, China)*

10:30 Coffee Break (20 min)

THa-2 Chair: P. Kluth (Australian National Univ.)

10:50 I-12 Ion-Track Nanotechnology for Energy Applications

Maria Eugenia Toimil-Molares (GSI Helmholtz Centre for Heavy Ion Research, Tech. Univ. Darmstadt, Germany)

11:20 O-29 Fabrication of Highly Rectifying Conical Nanopores in Amorphous SiO₂ Membranes *Alexander Kiy (Australian National Univ., Australia)*

11:40 O-30 Ion tracks in ultrathin polymer films: The role of the substrate *Ricardo Papaléo (Pontifical Catholic Univ. of Rio Grande do Sul, Brazil)*

12:00 O-31 Cryogenic electron microscopy characterization for the fine-structure of latent ion tracks in polymer *Haizhou Xue (Inst. of Modern Physics, CAS, China, Advanced Energy Science and Tech. Guangdong Laboratory, China)*

12:20 Lunch (80 min)

- THp-1 Chair: R. Rymzhanov (Joint Inst. for Nuclear Research)
- 13:40 I-13 Characterization of vibrational and electronic properties of defects in ion irradiated fluorite oxides *Marat Khafizov (The Ohio State Univ., USA)*
- 14:10 O-32 Molecular dynamics simulation of energy release from radiation defects in silicon down to cryogenic temperatures *Kai Nordlund (Univ. of Helsinki, Finland)*
- 14:30 O-33 Nonthermal Effects in Insulators under Ultrafast Electronic Excitations *Roman Voronkov (P.N. Lebedev Physical Inst. of the Russian Academy of Sciences, Russia)*
- 14:50 O-34 Defect formation simulated by track structure calculation model *Tatsuhiko Ogawa (Japan Atomic Energy Agency, Japan)*
- 15:10 Coffee Break (20 min)

- THp-2 Chair: J. O'Connell (Nelson Mandela Univ.)
- 15:30 I-14 Radiation effects in MAX phases: progress and outlook *Chenxu Wang (Peking Univ., China)*
- 16:00 O-35 Tailoring oxide thin films by ion irradiation *Shengqiang Zhou (Helmholtz-Zentrum Dresden-Rossendorf, Germany)*
- 16:20 O-36 High-Pressure Platform for Swift Heavy Ion Irradiations at GSI *Christina Trautmann (GSI Helmholtz Center, Germany)*
- 16:40 PB-09 (**Transferred**) Linear Energy Transfer Dependence of the Scintillation Properties of CeF₃ *Masanori Koshimizu (Shizuoka Univ., Japan)*
- 17:00 Poster Session 2 (120 min)

Friday, September 8, 2023

- Fa-1 Chair: D.K. Avasthi (Univ. Petr. & Energy Study)
- 9:00 I-15 Swift Heavy Ion Induced Radiation Effects in Scintillator Materials *Vladimir Pankratov (Univ. of Latvia, Latvia)*
- 9:30 O-38 Interpretation of Local and Global Lattice Strains Observed by X-Ray and

- Electron Diffraction *Sergei Dudarev (UK Atomic Energy Authority, UK)*
- 9:50 O-39 Electron Excitation-Induced Crystallization of Amorphous GeSn
Manabu Ishimaru (Kyushu Inst. of Tech., Japan)
- 10:10 O-40 Low energy ion-beam induced modification of 2D functional
nanomaterials for superior gas sensing performance *Shyamal Chatterjee (IIT
Bhubaneswar, India)*
- 10:30 Coffee Break (20 min)
- Fa-2 Chair: R Papaléo (P.C. Univ. Rio Grande do Sul)
- 10:50 O-41 Radio-oxidation mechanisms in polyethylene and spectral signature of
final products: a contribution from atomic scale simulations *Guido Roma (Univ.
Paris-Saclay, CEA, France)*
- 11:10 O-42 Radiation induced degradation of Bi₂O₃ and TiO₂ enriched commercial
3D printing polymers *Antonio Jreije (Kaunas Univ. of Tech., Lithuania)*
- 11:30 O-43 Analysis of radiation interactions in phosphors using the PHITS track-
structure mode for evaluating the response of radiation detectors *Yuho Hirata
(Japan Atomic Energy Agency, Japan)*
- 11:50 Closing (20 min)