Channeling 2024: *Advance Program*

Sunday, 8 **September -** ***Hotel Corallo***

16:00-18:00 - **Registration at the Hotel Corallo** [1]

"CHANNELING PRIMER"
Hotel Corallo

17:00-17:10 **S. Dabagov**, Opening

17:10-18:00 - **Prof. Carlo Vecce**, New Light on Leonardo (and Leonardo and Light) *(Invited)*

18:00-19:30 - **Welcome drink at the Hotel Corallo**

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[1] Registration at the conference's desktop will be opened till the morning of Friday, September 13, 2024

W1: *Channeling Applications for FCC and other Future Accelerators*
Session W1.1 Chair: S. Dabagov

9:00-9:30 **F. Zimmermann**
Possible Crystal Applications for FCC and Beyond *(Invited)*

9:35-9:50 **G. Broggi**
First Studies of Crystal Collimation for the FCC-ee

9:55-10:10 **F. Alharthi**
Novel Approach to Positron Production for the FCC-ee Using Lattice Coherent Effects in Oriented Crystals

10:15-10:30 **A. Sytov**
G4ChannelingFastSimModel and G4BaierKatkov Model for the FCC-ee Crystal-Based Positron Source

10:35-10:50 **G. Paterno**
Study of a Positron Source for FCC-ee Based on Oriented Crystals - Setup Optimization and Experimental Measurements

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Coffee break

W1: *Channeling Applications for FCC and other Future Accelerators*
Session W1.2 Chair: F. Zimmermann

11:15-11:45 **D. Mirarchi**
First Operational Use of Crystal Collimation at the Large Hadron Collider (LHC) with High Intensity and High Energy Heavy-Ion Beams *(Invited)*

11:50-12:05 **D. Veres**
The Potential of Resonance Islands Combined with Bent Crystals for Slow Extraction in Circular Hadron Accelerators

12:10-12:25 **S. Redaelli**
TWOCRYST: A Proof-of-Principle Machine Test for a Double-Crystal Fixed-Target Experiment at the LHC

12:30-12:45 **M. Romagnoni**
Crystal Assisted Steering of Muon Collider Beam

12:50-13:05 **G. Casati**
Radiation Pressure Driven Collisionless Shock Ion Acceleration at Brookhaven National Laboratories

13:10-13:40 **S. Miscetti**
Status and Prospects for the Mu2e Experiment at Fermilab *(Invited)*

Lunch break

S2: *Radiation: Generation Interaction*
Session S2.1 Chair: V. Kotanjyan

16:00-16:30 **P. Karataev**
Experimental Investigation of Coherent Cherenkov Diffraction Radiation in Super-radiant Regime *(Invited)*

16:35-16:50 **A. Clapp**
Cherenkov Diffraction Radiation Studies at Diamond Light Source using a One Dimensional Beam Position Monitor

16:55-17:10 **A. Savchenko**
Geant4 Implementation of Inverse Compton Scattering

17:15-17:30 **F. Nguyen**
FEL Performance and Tolerance Studies of the EuPRAXIA@SPARC_LAB AQUA Beamline

17:35-17:50 **H. Harutyunyan**
Features of Radiation Generated by a Charged Particle Flying Through a Ball of Dispersive Material

17:55-18:10 **G. Margaryan**
Radiation from a Charged Particle Rotating Around a Ball of a Dispersive Matter

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Coffee break

18:30-19:30

Poster Session **PS1** **Chair: F. Galdenzi**

PS1-01 On the Possibility of Creating Sources of Induced Short-Wave Radiation Based on Channeling Electrons in an Optical Lattice *by Vysotsky et al*

PS1-02 On the Possibility of Resonance Capture of Valence Electrons by Non-Relativistic Protons Channeled in Carbon Nanotubes *by Maksyuta et al*

PS1-03 Microtron M-5 at Tomsk Polytechnic University *by Cherepennikov et al*

PS1-04 Influence of Secondary Electron Emission on Particle Generation in a Pyroelectric Accelerator *by Oleinik et al*

PS1-05 Pion Photoproduction on a Deuteron at the VEPP-3 Electron Beam *by Cherepennikov et al*

PS1-06 Study of the Evolution of Populations of Transverse Energy Levels during Channeling of Weakly Relativistic Positrons in Hexagonal Crystals *by Maksyuta et al*

PS1-07 Influence of the Crystal Curvature on the Angular Distribution of Channeled Particles *by Dik et al*

PS1-08 SYLA Accumulator Ring Status *by Dyubkov et al*

PS1-09 Can Microscopic Structure of Matter Affect X-ray Polarization Radiation? *by Shapovalov et al*

PS1-10 Features of Electron Bunch Formation in Radiofrequency Photoinjectors *by Vladimirov et al*

PS1-11 Peculiarities of Twisted Photon Generation in the Undulator *by Bragin et al*

PS1-12 Radiation from Electrons Channeled in the System of Fan-Oriented Half-Wavelength Crystals *by Bogdanov et al*

PS1-13 Observation of Coherent Transition Radiation in Super-Radiant Regime and its Application for Longitudinal Diagnostics *by Karataev et al*

PS1-14 A Novel Python Tool for Analyzing Geant4 Simulations: Enhancing Understanding of Particle Channeling in Crystals *by Negrello et al*

PS1-15 Development and First Measurement Results of a 3.5-Cells S-band RF Gun with a Photocathode for the SYLA Synchrotron Complex *by Ashanin et al*

PS1-16 Influence of Crystals Mosaic Structure on the Characteristics of Fast Electrons Radiation *by Vnukov et al*

S1: ***Beams Interactions***
Session S1.1 **Chair: S. Redaelli**

9:00-9:30 **P. Klag**
A Positron Beamline for Channeling Experiments at MAMI *(Invited)*

9:35-9:50 **R. Negrello**
Positron Beam Steering via Planar Channeling and Volume Reflection with Silicon Crystals at MAMI

9:55-10:10 **V. Vysotsky**
Mechanism of Self-Collimation and Weakening of Dechanneling During Realistic Channeling of Positive Ions in Crystals

10:15-10:30 **V. Maisheev**
Multiple Scattering, Volume Capture and Volume Reflection of Positive Charged Particles in Bent Single Crystals

10:35-10:50 **A. Sytov**
Full Simulations of Beam Dynamics of Crystal-Based Extraction from the DESY II Booster Synchrotron using BDSim Simulation Code Boosted with G4ChannelingFastSimModel

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Coffee break

S2: ***Radiation: Generation & Interaction***
Session S2.2 Chair: A. Ghigo

11:15-11:45 **A. Saharian**
Radiation of Surface Polaritons by a Charge Circulating inside a Dielectric Cylindrical Waveguide *(Invited)*

11:50-12:05 **V. Kotajyan**
Radiation of Surface Polaritons by an Annular Beam Coaxially Enclosing a Cylindrical Waveguide

12:10-12:25 **P. Karataev**
Cherenkov Radiation from Transparent Plate for Beam Diagnostics

12:30-12:45 **V. Kocharyan**
Observation of X-Ray Transition Radiation from Relativistic Electrons Passing a Stack of Plates

12:50-13:05 **V. Gavrilenko**
Coherent Thomson Backscattering and Cherenkov Superluminal Effect

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Lunch break

S3: *New Concepts*
Session S3.1 Chair: L. Bandiera

16:00-16:30 **H. Backe**
Planar Channeling of 855 MeV Electrons in a Boron-Doped (110) Diamond Undulator - a Case Study *(Invited)*

16:35-16:50 **V. Vysotskii**
Controlled Channeling of Atom Electrons and Accompanying Nuclear Processes During the Orientational Action of a Polarized Laser Pulse on a Crystal

16:55-17:10 **A. Shchagin**
Volume Reflection Crystalline Undulator

17:15-17:30 **L. Malagutti**
Silicon Crystalline Undulator Based on Silicon Nitride Stressor Layer Patterning: Design and Building from TECHNO-CLS Project

17:35-17:50 **H. Sarkisyan**
Few-Particle Intraband Dipole Transitions in Strongly Oblate Asymmetric Ellipsoid QD

17:50-18:10 **Y. Mamasakhlisov**
Thermodynamic Parameters of the Electron Gas in CdSe Nanoplatelets

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Coffee break

18:30-19:30

Poster Session **PS2** **Chair: G. Delle Monache**

PS2-01 111In Medical Isotope Production via Different Accelerator Types *by Bakhshiyan et al*

PS2-02 Completeness of the Number of Quasars Surrounding the Quasar 0851+20 as a Sample for the Detection of Cosmic Voids *by Karapetyan et al*

PS2-03 On a New Method of Diffraction Microradiography of Single Crystals *by Mnatsakanyan et al*

PS2-04 Monocapillary X-ray Semilens Application for Imaging of Fine Details in Macroscopic Object *by Cherepennikov et al*

PS2-05 Form-Factor of Hollow Electron Beams in Smith-Purcell Radiation *by Sergeeva et al*

PS2-06 Shaped Cherenkov Radiators for Increasing of Light Collection l*by Savchenko et al*

PS2-07 Smith-Purcell Radiation of Vortex Electrons from a Metasurface *by Garaev et al*

PS2-08 Identification of Material by X-ray Fluorescence Analysis with a Pyroelectric X-ray Generator *by Karataev et al*

PS2-09 On the Feasibility of Employing a Territorial Anti-Seismic Early Warning and Protection System in Armenia *by Mkhitaryan et al*

PS2-10 ESR Study of New Dynamic Processes in Liquid and Frozen States of the Oriented Liquid Crystal Systems *by Bezhanova et al*

PS2-11 Cherenkov Diffraction Radiation Generated by 3D Printed Plastic Samples *by Karataev et al*

PS2-12 Development of Numerical Model for Simulation Dose Distribution in Gd-based Neutron-Capture Radiation Therapy Sessions *by Cherepennikov et al*

PS2-13 Gain Coefficient of Stimulated Radiation in a System of Two Undulators *by Gevorgyan et al*

PS2-14 Line Shape of Soft Photon Radiation Generated at Zero Angle in an Undulator with a Dispersive Medium *by Gevorgyan et al*

PS2-15 Coherent Radiation of Modulated Positron Bunch Formed in Crystalline Undulator *by Gevorgyan et al*

PS2-16 The European Plasma Research Accelerator with eXcellence In Applications (EuPRAXIA) Advanced Photon Sources (EuAPS) Betatron Radiation Source: Status Update and Photon Science Perspectives *by Galdenzi et al*

S1: *Beams Interactions*
Session 1.2 Chair: V. Giudi

9:00-9:30 **M. Romagnoni**
Enhancing Planar Channeling Efficiency: Final Results from the GALORE Project *(Invited)*

9:35-9:50 **A. Mazzolari**
Bent Crystals for Spin Precession Experiment at LHC

9:55-10:10 **M. Bauce**
Beam Superimposition with Bent Crystals

10:15-10:30 **M. Bondarenco**
Truncated Coulomb Potential for Planar Channeling

10:35-10:50 **M. Cosic**
On Shape Stability of Angular Distributions of Channeled Protons

10:55-11:10 **A. Stepanov**
First-principles Calculations of Channeling of Low-Energy Ions in SWCNTs and the Effect of Many-Particle Interactions

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Sightseeing Tour to Ravenna

S2 & S3: ***Radiation: Generation & Interaction & New Concepts***
Session 2.3 & 3.2 **Chair: L. Cavoto**

9:00-9:30 **L. Bandiera**
Electromagnetic Processes in Strong Crystalline Fields: Toward a High-Performance Calorimeter for Future HEP Experiments *(Invited)*

9:35-9:50 **A. Stakhova**
Features of Spontaneous Short-Wave Radiation during Channeling of Weakly Relativistic Electrons in the Main Crystallographic Planes of Tetrafluoroaluminates

9:55-10:10 **H. Khachatryan**
Observation of Coherent Cherenkov and Transition Radiation at the AREAL Accelerator

10:15-10:30 **J. Resta-Lopez/A. Sytov**
Ultra-High Acceleration Gradient using Structured Nanomaterials

10:35-10:50 **M. Hovhannisyan**
Development of Methods for Creating Sensitive Receivers for the Detection of Distant Quasars

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Coffee break

W2: ***Laser and Particle Guiding in Plasmas and Related Phenomena***
Session W2.1 Chair: A. Curcio

11:15-11:45 **P. Cirrone**
Laser and Particle Guiding in Plasmas at I-LUCE (INFN Laser indUCEed radiation production) facility *(Invited)*

11:50-12:05 **D. Giulietti**
Intense Laser Pulses Propagation in Overdense Plasmas

12:10-12:25 **A. Curcio**
Experiments of Particle Guiding and Radiation in Laser-Plasma Channels

12:30-12:45 **D. Valzani**
Innovations and Developments in Ge Gamma Undulators with Pulse Laser Melting

12:50-13:05 **G. Dattolli**
Compton Backscattering Sources, High Intensity Lasers and Non-Linear QED Phenomenology

13:10-13:40 **S. Arjmand**
Implementing Capillary Design for Reliable VHEE Beam Delivery *(Invited)*

Lunch break

S4: ***Applications & X-Rays***
Session 4.1 **Chair: D. Hampai**

16:00-16:30 **Y. Hayakawa**
Application of PXR-based X-ray Source Using a Si(400) Radiator in the 40-keV Region *(Invited)*

16:35-16:50 **V. Dyubkov**
Current Activities on the 4th Generation Synchrotron Source SYLA of the NRC KI

16:55-17:10 **Z. Ebrahimpour**
MCP Optical Device Characterization Using Synchrotron Radiation in the Soft X-Ray Domain

17:15-17:30 **A. Perez**
Polycapillary Applications for Tomographic Studies

17:35-17:50 **Y. Cherepennikov**
Analysis of Corundum Crystals Optical and Ultraviolet Transmittance after Electron Beam Exposure

17:55-18:10 **A. Shahverdyan**
Comparative Analysis of X-ray CT Images and the Results of Digital Modeling of Objects Printed on a 3D Printer

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20:00 **Social Dinner**

S4: ***Applications & X-rays***
Session S4.2 **Chair: A. Mazzolari**

9:00-9:30 **L. Cavoto**
Carbon Nanostructure for Particle Physics, the Ptolemy Experiment *(Invited)*

9:35-9:50 **L. Cecchini**
Investigating the Relationship between Tip Effect and Field Emission in Vertically Aligned Carbon Nanotubes

9:55-10:10 **A. Stepanov**
Mechanisms of Destruction of MWCNTs of Various Diameters under Ion Irradiation

10:15-10:30 **A. Avetisyan**
Investigating the Impact of Metalloporphyrins on DNA Damage During Electron Beam Irradiation

10:35-10:50 **A. Shchagin**
De Broglie Wave and Longitudinal Density Effect Wave and Longitudinal Density Effect

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Coffee break

S3 & S4: ***New Concepts & Applications & X-rays***

Session S3.3 & S4.3 **Chair: L. Marchitto**

11:15-11:45 **D. Hampai**
XCT: from Synchrotron to Desktop Applications *(Invited)*

11:50-12:05 **L. Porcelli**
Novel Hardware Setup for Astrophysics and Cosmology at INFN-LNF

12:10-12:25 **A. Muradyan**
Quantum Mechanical Estimation of Dielectric Constant Values in Dielectric Materials in a Special State with Negative Dielectric Constant

12:30-12:45 **A. Shchagin**
Doppler Effect in a Medium in the X-ray Range

Channeling 2024: Closing **Chair: S. Dabagov**
