

Advance Program

*Sunday, 23 September - "CHANNELING PRIMER"
at Teatro Civico (Piazza del Teatro 1, Alghero)*

13:00-14:00 - **Registration**

14:00 - **S.B. Dabagov & L. Palumbo**, Opening

14:15 - **S. Lubrano** - Mayor of Alghero

A. Cardi - Vice Mayor by Culture, Greetings from Comune di Alghero

14:45 - **U. Dosselli** - Director of LNF

A. Ghigo - Dir. of Accelerator Div., LNF: New Trends of Frascati

15:15 - **R. Carrigan & E. Tsyganov**, High Energy Channeling History

15:45 - **S. Bertolucci**

L. Bottura, LHC: Status & Future

16:15 - **S. Guiducci**, SuperB: a New Frascati Collider Facility

16:45 - **V. Malka**, Electron & X-ray Beam with Laser-Plasma Accelerators

17:15 - **M.L. Carvalho**, Focusing Systems for X-ray Micro Beam: an Overview

17:45 - **R. Bonifacio**, Quantum FEL *** CANCELLED ***

19:00-20:00 - **Welcome Party**

Monday, 24 September - Hotel Calabona

S1: Coherent Bremsstrahlung

Session 1.1 **Chair: R. Avakian**

- 9:00-9:25 **N. Shul'ga**
High-Energy Wave Packets in Processes of Bremsstrahlung, Transition and Coherent Radiation (*Invited*)
- 9:30-9:45 **M. Bondarenco**
Symmetry Properties in Angular Distribution of Radiation in Thin Crystals
- 9:50-10:05 **S. Trofymenko**
On the Influence of a Particle's Field Evolution on its Ionization Energy Losses in Thin Layers of Substance
- 10:10-10:25 **D. Karlovets**
Method of Induced Currents and its Applications to the Different Problems of Polarization Radiation
- 10:30-10:45 **Yu. Pivovarov**
Line Spectra of Electromagnetic Radiation from Relativistic Nuclei Passing Through Matter

Coffee break (20 min)

S1: Coherent Bremsstrahlung

Session 1.2 **Chair: N. Kalashnikov**

- 11:10-11:35 **K. Ispiryan**
Coherent X-Ray Radiation Produced by Microbunched Beams in Amorphous and Crystalline Radiators (*Invited*)
- 11:40-11:55 **S. Fomin /N.F. Shul'ga/**
Features of Non-Dipole Radiation by Relativistic Electron in Thin Crystal
- 12:00-12:15 **Yu. Kunashenko**
Coherent Bremsstrahlung from Neutrons
- 12:20-12:35 **V. Ganenko**
Investigation of Coherent Bremsstrahlung A-type and B-type at Electron Energy 200 MeV
- 12:40-13:05 **E. Tsyganov**
Registration of Energy Discharge in $D^+D \rightarrow 4He^*$ Reaction in Conducting Crystals (Simulation of Experiment) (*Invited*)

Lunch break (3 h)

S2: Channeling Radiation & Related Phenomena

Session 2.1 **Chair: H. Backe**

- 16:00-16:25 **V. Baryshevsky**
Time Oscillations of the Intensity of Parametric and Diffracted Channeling X-Ray Radiation (*Invited*)
- 16:30-16:45 **R. Avakian**
Comparison of the SLAC Experimental Data on the Radiation of Planarly Channeled Positrons with Theory Taking into Account the Medium Polarization
- 16:50-17:05 **N. Kalashnikov**
Plasmon "Wings" in the Photon Emission Spectra of the Quantum Channeled Particle
- 17:10-17:25 **K. Korotchenko**
High-Order Diffraction Reflection and DCR

Coffee break (20 min)

S2: Channeling Radiation & Related Phenomena

Session 2.2 **Chair: D. Dauvergne**

- 17:50-18:15 **Yu. Pivovarov**
Experimental and Theoretical Study of Parametric X-Radiation at Channeling from 255 MeV Electrons in Si (*Invited*)
- 18:20-18:35 **V. Fedorov**
A Search for nEDM and New Constraints on Short-range "Pseudo-magnetic" Interaction Using Neutron Optics of Noncentrosymmetric Crystals
- 18:40-18:55 **A. Ananyeva**
Resonant Coherent Excitation of Relativistic Highly Charged Ions at Planar Channelling in Si-Crystal
- 19:00-19:15 **E. Babakhanyan**
Above-Barrier Reflection and Degenerate States of Energy Band Spectrum in Planar Channeling of Electrons and Positrons

PS: Session Poster

Session PS1 **Chair: D. Hampai**

- PS1-01 N.F. Shul'ga, V.V. Syshchenko and V.S. Neryabova - Spectral Method in the Axial Channeling Theory

- PS1-02 S. Blazhevich, Yu. Gladkih and A. Noskov - Coherent X-radiation Generated in Periodic Layered Medium Along the Relativistic Electron Velocity
- PS1-03 S. Birol, O.B. Kolcu and A. Dizdar - How to Measure the LPM Effect in Low Z Medium
- PS1-04 V.A. Maishev, A.G. Afonin, G.I. Britvich, Yu.A. Chesnokov, P.N. Chirkov, A.A. Durum, A.A. Yanovich and I.A. Yazynin - Theoretical and Experimental Study of Beam Focusing with the Help of Bent Single Crystals
- PS1-05 O.B. Kolcu and A. Dizdar - SPARC Beamline Optimization for Channeling Experiments
- PS1-06 D.Yu. Sergeeva, A.A. Tishchenko and M.N. Strikhanov - UV and X-Ray Diffraction and Transition Radiation from Charged Particles Bunches
- PS1-07 A. Babaev and Yu.L. Pivovarov - Stark Effect for He-like Ions Planar Channeled in a Crystal
- PS1-08 Yu.L. Pivovarov, Y. Takabayashi and T.A. Tukhfatullin - Doughnut Scattering of 255 MeV Electrons at $\langle 100 \rangle$ Axial Channeling in Thin Si Crystal
- PS1-09 P. Schoofs, F. Cerutti, A. Ferrari and G.I. Smirnov - Monte Carlo Modeling of High-Energy Channeling Studies
- PS1-10 E. Bagli and V. Guidi - DYNECHARM++: a Software to Simulate the Motion of Charged Particles in Complex Atomic Structures
- PS1-11 V.B. Ganenko, J. Brudvik, D. Burdeinyi, K. Fissum, K. Hansen, L. Isaksson, K. Livingston, M. Lundin, B. Nilsson, V. Truten', B. Schreder and N. Shul'ga - Radiation Spectra of Electrons with Energy Two Hundred MeV Moving in Diamond and Silicon Crystals near their Axis and Planes
- PS1-12 E.A. Mazur - Generation of Plasmons and Electron Excitations by Quantum Channeled Particle in Crystal *** **CANCELLED** ***
- PS1-13 S. Abdrashitov, O.V. Bogdanov, Yu.L. Pivovarov and T.A. Tukhfatullin - Orientation Dependence of Energy Loss of Relativistic Electrons and Positrons by Channeling Radiation in Thin Si Crystal
- PS1-14 K.B. Korotchenko and Yu. Kunashenko - Channeling Radiation from Polarized Electron
- PS1-15 A.R. Mkrtchyan, L. Grigoryan, H.F. Khachatryan and A. Aslanyan - Radiation from a Particle in Flight through a Plate, the Parameters of Which Vary According to an Arbitrary Periodical Law
- PS1-16 N.P. Kalashnikov, A. Olchak and E.V. Khangulian - Radiation from Channeling Electrons, Stimulated by Laser Beam
- PS1-17 K. Kruchinin, D.V. Karlovets and J.S. Talaeva - Polarization Radiation generated by a Charged Particle on a Rectangular Screen of Finite Permittivity
- PS1-18 Yu. Kunashenko - Coherent Bremsstrahlung from Planar Channeled Positron

- PS1-19 O. Bogdanov and S.B. Dabagov - Dechanneling Studies for Moderate Energy Electrons in Si Crystals
- PS1-20 E. Bessonov - Light Sources Based on Relativistic Ion Beams
- PS1-21 A.G. Afonin, V.T. Baranov, M.K. Bulgakov, Yu.A. Chesnokov, P.N. Chirkov, V.N. Gorlov, I.V. Ivanova, D.M. Krylov, A.N. Lun'kov, V.A. Maishev, S.F. Reshetnikov, D.A. Savin, E.A. Syshchikov, V.I. Terekhov, I.S. Voinov, I.A. Yazynin, V.B. Ganenko, I. Kyryllin, N.F. Shul'ga and V.I. Truten' - Observation and Comparative Analysis of Proton Beam Extraction/Collimation by Different Planar Channels of a Bent Crystal
- PS1-22 A. Babaev and S.B. Dabagov - Inelastic Nuclear Interactions at Crystal Collimation of Proton Beams *** **Oral Session S3.3** ***
- PS1-23 A. Babaev, J.F. Clivaz and S.B. Dabagov - Simulation of Crystal Collimation in View of SPS/CERN Beam Optics
- PS1-24 S. Mahdipour, B. Azadegan, S.B. Dabagov and W. Wagner - Simulation of Positron Beam Generated by Photons from Channeled Relativistic Electrons on Different Crystallographic Planes and Axes of Si, C, Ge and W Crystals with Geant4 and McnpX Monte-Carlo Codes
- PS1-25 O. Bogdanov, E. Ficks and Yu.L. Pivovarov - Spectral and Angular Distributions of Emission from Relativistic Channeled Electrons in a Diamond Crystal in Vicinity of the Cherenkov Angle
- PS1-26 M.A. Aginian, K.A. Ispirian and M.K. Ispiryan - Channeling Radiation of Microbunched Beams
- PS1-27 L.A. Gevorgian, K.A. Ispirian and A.H. Shamamian - Crystalline Undulator Radiation of Microbunched Beams Taking into Account the Medium Polarization
- PS1-28 I. Polimatidi and S. Smirnov - The Effect of Electron Beam Reflection in Axial Channeling Mode *** **Oral Session S3.2** ***
- PS1-29 K. Kruchinin and A.P. Potylitsyn - Is it Possible to Produce Circularly Polarized γ -beam via Coherent Bremsstrahlung Process?
- PS1-30 T. Sakae, Y. Hayakawa, Y. Takahashi, M. Inagaki, K. Nakao, K. Nogami, T. Sakai, T. Kuwada, T. Kaneda, I. Sato, K. Hayakawa and T. Tanaka - Elemental Analysis Using Parametric X-ray Generated at LEBRA, Nihon University

Tuesday, 25 September - Hotel Calabona

S3: Channeling & Crystal Collimation

Session 3.1 **Chair: W. Scandale**

9:00-9:25 **V. Tikhomirov**

Multiple Volume Reflection as an Origin of significant Scattering Intensity and Radiation Power Increase (*Invited*)

9:30-9:45 **A. Kovalenko**

Experiments with Bent Crystals for High Energy Ion Beams

9:50-10:05 **I. Kyryllin /S. Trofymenko/**

High-Energy Charged Particle Deflection by a Bent Crystal in TeV energy Region

10:10-10:25 **G. Kovalev**

Scattering of Relativistic Particles in Bent Crystal with Variable Curvature

10:30-10:45 **L. Bandiera**

On the Radiation Accompanying Volume Reflection

Coffee break (20 min)

S3: Channeling & Crystal Collimation

Session 3.2 **Chair: F. Murtas**

11:10-11:35 **M. Motapothula**

Transmission Axial and Planar Channeling of Protons from Ultra thin(55nm) Si (*Invited*)

11:40-11:55 **A. Mazzolari**

Deflection of MeV Protons by an Unbent Half-Wavelength Silicon Crystal

12:00-12:15 **M. Bondarenco**

Multiple Scattering and Volume Capture of Charged Particles in Bent Crystals

12:20-12:35 **E. Bagli**

Measurement of the Dechanneling Length for High-Energy Negative Pions

12:40-12:55 **I. Polimatidi**

The Effect of Electron Beam Reflection in Axial Channeling Mode

Lunch break (3 h)

S4: X-ray Channeling & X-ray Optics
Session 4.1 **Chair: T. Childs**

- 16:00-16:25 **P. von Ballmoos**
Gamma-ray Optics for High-Energy Astrophysics (*Invited*)
- 16:30-16:45 **Y. Hayakawa**
Computed Tomography for Light Materials Using Monochromatic X-ray Beam Produced by Parametric X-ray Radiation
- 16:50-17:05 **A. Shchagin**
Excitation of Evanescent Wave by Parametric X-ray Radiation
- 17:10-17:25 **A. Mkrtchyan**
About the Acoustoplasma State at Low Pressure

Coffee break (20 min)

S4: X-ray Channeling & X-ray Optics
Session 4.2 **Chair: A. Esposito**

- 17:50-18:15 **K. Tsuji**
X-ray Elemental Imaging with Scanning and Projection Modes in the Laboratory (*Invited*)
- 18:20-18:35 **D. Hampai**
Desktop X-ray Tomography of Low Contrast Samples
- 18:40-18:55 **L. Allocca**
Laboratory PolyCO Based X-ray Imaging of High-Pressure Fuel Sprays
- 19:00-19:15 **A. Gorghinian**
X-ray Microfluorescence Analysis of Augustan Coins

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- 21:00-22:00 **Round Table 1: E. Tsyganov**
Registration of Energy Discharge in $D^+D \rightarrow 4He^*$ Reaction in Conducting Crystals (Simulation of Experiment)

Wednesday,
26 September - *Hotel Calabona*

S4: X-ray Channeling & X-ray Optics
Session 4.3 **Chair: A. Potylitsyn**

- 9:00-9:25 **W. Gabella**
Generation and Application of Channeling X-Rays using a Novel Low-Emittance Electron Beam: Plans and Status (*Invited*)
- 9:30-9:45 **A. Lobko**
Parametric Gamma-Radiation: Parametric X-rays from Relativistic Electrons Passing Through a Mossbauer Crystal
- 9:50-10:05 **A. Marcelli**
X-Ray Spectroscopy of Fluorescence Radiation Channeling in μ -Capillary Holed Glass Plates
- 10:10-10:25 **Art. Mkrtchyan**
Monochromatization of Diffracted Neutrons by Acoustic Superlattice
- 10:30-10:45 **V. Kocharyan**
Diffraction of Neutrons on the Acoustic Superlattice

Coffee break (20 min)

S4-S5: X-ray Channeling & X-ray Optics;
Novel sources: PXR&TR&FEL&Plasma
Session S4-S5 **Chair: V. Baryshevsky**

- 11:10-11:35 **X. Artru**
Radiation Induced by Charged Particles in Optical Fibers (*Invited*)
- 11:40-11:55 **S. Blazhevich**
Dynamic Theory of Coherent X-radiation of Relativistic Electron Within a Periodic Layered Medium in Bragg Scattering Geometry
- 12:00-12:15 **A. Movsisyan**
X-Ray Acoustic Diffractometer
- 12:20-12:35 **D. Karlovets**
Twisted Electron in a Strong Laser Wave
- 12:40-12:55 **V. Guidi**
High-reflectivity Laue Lens Made by Curved Crystals for High-Resolution Focusing of X and gamma Rays

Excursion /Grotte di Nettuno/

21:00-22:00 **Round Table 2: E. Bessonov**
One way to Lorentz's Transformations

Thursday, 27 September - Hotel Calabona

S2: Channeling Radiation & Related Phenomena

Session 2.3 **Chair: X. Artru**

9:00-9:25 **H. Backe**

Observation of Undulator Radiation at Channeling of Electrons in Strained Layer Si-Ge Crystals at MAMI (*Invited*)

9:30-9:45 **V. Tikhomirov**

Crystal Undulators: from the Prediction to the Mature Simulations

9:50-10:05 **A. Kostyuk**

Recent Progress in the Theory of the Crystalline Undulator

10:10-10:25 **B. Azadegan**

Simulation of Planar Channeling Radiation Spectra of Relativistic Electrons and Positrons in Single Crystals Base on Mathematica

10:30-10:45 **O. Bogdanov**

Radiation Energy Loss of Relativistic Electrons at Axial and Planar Channeling in Tungsten Crystal

Coffee break (20 min)

S3: Channeling & Crystal Collimation

Session 3.3 **Chair: V. Guidi**

11:10-11:35 **Yu. Chesnokov**

Twenty-five Years of Bent Crystal Channeling Applications for Beam Splitting, Extraction and Collimation in the U-70 Accelerator of IHEP (*Invited*)

11:40-11:55 **W. Scandale**

Strong Reduction of the Off-momentum Halo in Crystal Assisted Collimation of the SPS Beam

12:00-12:15 **A. Taratin**

Simulation of Crystal Assisted Collimation of the SPS Beam

12:20-12:35 **G. Smirnov**

Potential Thermal and Radiation Damage to Crystals in the LHC beams

12:40-12:55 **A. Babaev**

Inelastic Nuclear Interactions at Crystal Collimation of Proton Beams

Lunch break (3 h)

S5: Novel sources: PXR&TR&FEL&Plasma
Session 5.1 **Chair: N. Shul'ga**

- 16:00-16:25 **A. Potylitsyn**
Characteristics of Final Particles in Multiple Compton Backscattering Process (*Invited*)
- 16:30-16:45 **A. Jochmann**
Picosecond Narrow Bandwidth X-ray Pulses from a Laser-Thomson-Backscattering Source
- 16:50-17:05 **L. Grigoryan**
Intense Cherenkov Radiation from a Particle Rotating About a Dielectric Ball Along a Non-equatorial Orbit
- 17:10-17:25 **M. Shevelev**
Experimental Demonstration of Unexpected Behavior of Angular Cherenkov Radiation Distribution

Coffee break (20 min)

S5: Novel sources: PXR&TR&FEL&Plasma
Session 5.2 **Chair: A. Mkrtchyan**

- 17:50-18:15 **M. Borghesi**
Current and Future Ion Acceleration Mechanisms Employing Ultraintense Lasers (*Invited*)
- 18:20-18:35 **D. Giulietti**
Radiation and Particle Secondary Sources Based on Electron Laser Plasma Acceleration
- 18:40-18:55 **A. Schiavi**
Advances in Laser Fusion Energy
- 19:00-19:15 **V. Zvorykin**
Effects of Picosecond Terawatt UV laser Beam Filamentation and a Repetitive Pulse Train on Creation of Prolonged Plasma Channels in Atmospheric Air

PS: Session Poster
Session PS2 **Chair: O. Bogdanov**

- PS2-01 V. Malyshevsky - Dynamic Interaction of Neutral Atoms with Crystal Surface at Grazing Incidence
- PS2-02 G.P. Cirrone, C. De Martinis, D. Delle Side, A. Fazzi, D. Giove, D. Giulietti, L.A. Gizzi, L. Labate, T. Levato, P. Londrillo, M. Maggiore, V. Nassisi, Y. Oishi, L. Serafini, S. Sinigardi and G. Turchetti - Laser Induced Light Ion Acceleration at INFN National Laboratories in Frascati

- PS2-03 V. Shpakov and S.B. Dabagov - Far- and Near-Field Approximation for Diffraction Radiation
- PS2-04 Y. Takabayashi and K. Sumitani - Development of a Beam Profile Monitor Using Parametric X-ray Radiation
- PS2-05 K.B. Korotchenko, Yu.L. Pivovarov and Y. Takabayashi - Experimental and Theoretical Study of PXRC (Parametric X-Radiation at Channeling) from 255 MeV Electrons in Si
***** Oral Session S2.2 *****
- PS2-06 A.A. Tishchenko, K. Lekomtsev and M.N. Strikhanov - Smith-Purcell Radiation from a One-dimensional Photonic Wire
- PS2-07 V.V. Parazian and A.A. Saharian - Transition Radiation from a Monoenergetic Electron Bunch in Presence of Acoustic Waves
- PS2-08 L. Allocca, S. Alfuso, L. Marchitto, D. Hampai and S.B. Dabagov - 3D Simulation for PolyCO X Imaging of Fuel Sprays
- PS2-09 Y. Oishi and T. Nayuki - X-ray Generation from Tribocharging and Feasibility of Application for X-ray Fluorescence Analysis
- PS2-10 M. Ferrario, L. Giannessi and A.Z. Ligidov - Modulation of FEL Electron Beam in the Field of External Laser Radiation
- PS2-11 L.A. Gevorgian and A.R. Mkrtchyan - On Creation and Control of Dielectric Constant Superlattice in Spin-Glass Medium
- PS2-12 A.R. Mkrtchyan A.S. Abrahamyan, S.A. Chilingaryan and Q.G. Sahakyan - Noncorrect Inverse Problems in N_2 and CO_2 : N_2 :He Acoustoplasma
- PS2-13 A.A. Ponomarenko, M.I. Ryazanov, M.N. Strikhanov and A.A. Tishchenko - Terahertz Radiation from Electrons Moving through a Waveguide with Variable Radius, Based on Smith-Purcell and Cherenkov Mechanisms
- PS2-14 A.A. Tishchenko, V.V. Sofronova, M.N. Strikhanov, M.I. Ryazanov and A.P. Potylitsyn - Coherent X-ray Cherenkov and Transition Radiation at Bunch Oblique Incidence on a Target as X-ray Source
- PS2-15 A. Lobko - On the Phase Contrast Imaging by Parametric X-rays
- PS2-16 S.R. Uglov, V.V. Kaplin and V.N. Zabaev - Experimental Setup on 5.7 MeV Microtron for Investigation of Vacuum Ultraviolet and Ultrasoft X-Ray Radiation Generated in Multilayered Mirror
- PS2-17 V. Kaplin, and S.R. Uglov - Energy Dependence of Angular Patterns of X-rays Generated by 20-35 MeV Rechanneling Electrons in Ultrathick Si Crystals
- PS2-18 J.B. Zhang, D.A. Shkitov, S.L. Lu, M.V. Shevelev, T.M. Yu, A.P. Potylitsyn, K.R. Ye, G.A. Naumenko and H.X. Dengv - First Measurement of Sub-picosecond Electron Bunch Length with Coherent Diffraction Radiation Interferometry

- PS2-19 M. Kiss, J. Szasz, I. Santa and S.V. Kukhlevsky - Plasma-based Waveguides for Acceleration of Electrons: Experiment and Theory
- PS2-20 A.V. Shchagin and Y. Takabayashi - Parametric X-rays as Conversion of Virtual to Real Quanta
- PS2-21 G.V. Kovalev - Spheroidal Coordinates and Diffraction of Waves by Prolate Spheroid and Polyhedrons
- PS2-22 M.A. Aginian, K.A. Ispirian and M.K. Ispiryan - Parametric X-Ray Radiation Produced by Microbunched Beams
- PS2-23 L. Bobb, M. Billing, N. Chritin, P. Karataev and T. Lefevre - UV/X-ray Diffraction Radiation for Non-intercepting Micron-scale Beam Size Measurement
- PS2-24 V. Vysotskii, M. Vysotsky and S. Bartalucci - Nuclear Synthesis On Ordered Crystal Target With Participation Of Monochromatic Beams Of Light Or Middle Isotopes
- PS2-25 S.B. Dabagov, A.V. Dik and A.Z. Ligidov - Ion-Channeled Electron Radiation
- PS2-26 G. Gatti - All Optical Compton Based γ -ray Source

21:00 **Social Dinner**

Friday, 28 September - Hotel Calabona

S5: Novel sources: PXR&TR&FEL&Plasma
Session 5.3 **Chair: M. Ferrario**

9:00-9:25 **L. Rinolfi**

Brief History of CLIC and Other Brilliant Positron Sources (*Invited*)

9:30-9:45 **A. Kotanjyan**

Undulator Radiation Inside a Dielectric Waveguide

9:50-10:05 **A. Tishchenko**

Diffraction Radiation from Periodical Structures as a Source of X-rays

10:10-10:25 **G. Naumenko**

Left Handed Materials in Millimeter Wavelength Region

10:30-10:45 **E. Fiks**

Influence of Stopping in Radiator on the Cherenkov Radiation Angular Distributions from Relativistic Heavy Ions at FAIR, SPS and LHC Energies

Coffee break (20 min)

S5: Novel sources: PXR&TR&FEL&Plasma
Session 5.4 **Chair: D. Giulietti**

11:10-11:35 **L. Gizzi**

Acceleration with Self-Injection and All-Optical Radiation Sources at LNF (*Invited*)

11:40-12:05 **M. Ferrario**

SPARC_LAB (*Invited*)

12:10-12:35 **G. Dattoli**

Wave Undulators and Free Electron Lasers (*Invited*)

12:40-12:55 **E. Frolov**

Channeling of a Free Electron in a Field of Crossed Laser Beams

Closing
