

42nd International Workshop on High-Energy-Density Physics with Intense Ion and Laser Beams

January 31st - February 4th, 2022
via Zoom



Photo: G. Otto/GSI

P r o g r a m

Monday (January 31st)

Start	Duration	Speaker	Title
Session 1: FAIR Status, Capabilities, Plans (Chair: Vincent Bagnoud)			
8:30	00:10	SCHOENBERG/BAGNOUD	Opening: Welcome Participants from Europe and Asia
8:40	00:30	GIUBELLINO, Paolo	Status of FAIR Project and Perspectives for Research
9:10	00:30	SPILLER, Peter	Accelerator Performance Overview, Schedule, Plans
9:40	00:20	GOLUBEV, Alexander	HED@FAIR Collaboration Status and Future Plans
10:00	00:20	NEFF, Stephan	Experimental Facilities for High-Energy Density and Warm Dense Matter Experiments at FAIR
10:20	00:20	Coffee break	
Session 2: HED@FAIR Collaboration Overviews – HIEX/HHT (Chair: Paul Neumayer)			
10:40	00:30	MAJOR, Zsuzsanna	PHELIX Update and the Newly Established High-Energy-Laser Capability at the HHT experimental cave at GSI
11:10	00:30	RILEY, David	X-ray Probing of Ion-Beam Heated Iron
11:40	00:30	KRAUS, Dominik	Investigation of Carbon Isochorically Heated by Intense Heavy Ion Beams Using In Situ X-ray Diffraction and Spectrally Resolved X-Ray Scattering
12:10		Lunch break	
Session 3: HED@FAIR Collaboration Overviews – PRIOR and Laplas (Chair: Alexander Golubev)			
16:50	00:10	SCHOENBERG/BAGNOUD	Welcome North American Participants – ZOOM PHOTO
17:00	00:30	VARENTOV, Dmitry	PRIOR Status Report
17:30	00:30	SHILKIN, Nikolay	Shock Compressed Non-Ideal Plasmas for Proton Radiography at FAIR
18:00	00:30	TAHIR, Naeem A.	Optimization of the LAPLAS Design for Planetary Physics Research
18:30	00:20	IOSILEVSKIY, IGOR	On Perspectives of HED@FAIR Experimental Study of Dual Unexplored Phenomenon - Anomalous Thermodynamics Regions Nearby Entropic Phase Transitions
18:50			End of Day

Tuesday (February 1st)

Start	Duration	Speaker	Title
Session 4: HED Facilities and Research Overviews (Chair: Zsuzsanna Major)			
08:30	00:30	TONCIAN, Toma	Studying relativistic plasmas using the ReLaX laser at HED
09:00	00:30	BLIKOV, Anton	RFNC-VNIEF: Extreme States of Deuterium and Helium Plasmas at the Pressures up to 20 TPa
09:30	00:30	LÜTGERT, Julian	Probing the Opacity in the Interior of Red Dwarfs at NIF
10:00	00:20	Coffee break	
Session 5: Laser Particle Acceleration and Applications (Chair: Stefan Karsch)			
10:20	00:30	ROSMEJ, Olga	Ultra-Bright Sources of MeV Particles and Radiation Based on DLA Electrons
10:50	00:20	HORNUNG, Johannes	Laser-Proton Acceleration Scaling at PHELIX Using Regimes of Equal Laser Power
11:10	00:30	ZIMMER, Marc	Demonstration of Non-Destructive Material Characterization at a Laser-Based Neutron Source
11:40	00:20	GEULIG, Laura	Update on the Laser-Driven Heavy Ion Acceleration at CALA
12:00	00:20	MILLÁN CALLADO, Maria	Multi-Shot Characterization of a Laser-Driven Neutron Source at the PW DRACO Facility
12:20		Lunch break	
Session 6: HED and LPA Research Highlights (Chair: Juan Fernández)			
17:00	00:30	ZYLSTRA, Alex	Megajoule fusion yield produced from inertial fusion implosions at the National Ignition Facility
17:30	00:15	SHAW, Jessica	Developments in the Development of the OMEGA Electron Radiography HED Diagnostic – Part I
17:45	00:20	FREEMAN, Matthew	Developments in the Development of the OMEGA Electron Radiography HED Diagnostic – Part II
18:05	00:30	SCHENKEL, Thomas	Proton and Ion Pulses from Laser-Plasma Acceleration for Surface Modification and Doping of Semiconductors
18:30			End of Day

Wednesday (February 2nd)

Start	Duration	Speaker	Title
Session 7: Laser-Driven Particle Acceleration (LPA) and Applications (Chair: Christian Rödel)			
08:30	00:30	SCHRAMM, Ulrich	High Dose-Rate Irradiation with Laser Accelerated Proton Beams – Prerequisites and Pilot Study Results
09:00	00:20	ANDREEV, Nikolay	Laser-Driven Ultra-Relativistic Electrons for High Energy Density Research
09:20	00:20	KARSCH, Stefan	Hybrid LWFA-PWFA: A Stability and Beam-Quality Booster Laser-Generated Electron Beams
09:40	00:20	SAVEL'EV, Andrey	Low Divergent High Charge Electron Beams Laser Acceleration from Subcritical Plasma
10:00	00:20	SHEN, Xiaofei	Cross-Filament Stochastic Acceleration of Electrons in Kilojoule Picosecond Laser Interactions with Near Critical Density Plasmas
10:20	00:30	CERNAIANU, Mihail	Recent results on the ion acceleration commissioning experiment at 1 PW level in ELI-NP
10:50	00:20	Coffee break	
Session 8: WDM and Condensed Matter Research (Chair: Ronald Redmer)			
11:10	00:20	TKACHENKO, Igor	Static and Dynamic Properties of Warm Dense Matter
11:30	00:20	FEDOROV, Ilya	Exciton Mechanism as a Physics Model of Warm Dense Hydrogen Metallization
11:50	00:20	SCHÖRNER, Maximilian	Ab Initio Simulations for the Ion-Ion Structure Factor of Warm Dense Aluminum
12:10	00:20	PREISING, Martin	Nonmetal-To-Metal Transition in Dense Fluid Helium
12:30	00:20	FILLPOVIC, Marko	Study of QED Effects in Collision of Near-Surface Accelerated Electrons with High-Intensity Lasers
12:50		Lunch break	
15:00	1:30	Poster Session I	
Session 9: Laser-driven secondary sources and their applications (Chair: Thomas Schenkel)			
17:00	00:20	GÜNTHER, Marc	Strong Enhanced Laser-Driven Neutron Generation and Proton Acceleration Applicable for Nuclear Physics Applications
17:20	00:20	HESELBACH, Philipp	Optimization of X-Ray Backlighter Sources as Diagnostics for Ion-Heated Matter
17:40	00:20	PUKHOV, Alexander	Efficient Narrow-Band Terahertz Radiation from Electrostatic Wakefields in Nonuniform Plasmas
18:00	00:20	BOLLER, Pascal	On-line detection of radioactive fission isotopes produced by laser-accelerated protons
18:20	00:20	REICHWEIN, Lars	Dipole Laser Pulses for the Acceleration of Spin-Polarized Proton Bunches
18:40			End of Day

Thursday (February 3rd)

Start	Duration	Speaker	Title
Session 10: Inertial Confinement Fusion (Chair: Ulrich Schramm)			
08:30	00:30	ZHAN, Wenlong	Status of HIAF and ADS
09:00	00:30	ZHANG, Jie	Plasma Characteristics of the Compression, Acceleration and Collision Processes in the Double-Cone Ignition Scheme
09:30	00:20	HOFFMANN, D.H.H.	Laser and Particle Beam Interaction with Ionized Matter and Perspectives for Fusion Energy
09:50	00:20	ZHAO, Yongtao	p11B Nuclear Reactions Initiated by Laser-Accelerated Intense Proton Beam in Boron Plasma
10:10	00:20	HORA, Heinrich	Lower Than Thermal Pressures for Laser Driven Fusion Ignition
10:30	00:20	Coffee break	
Session 11: EOS (Chair: Yongtao Zhao)			
10:50	00:20	BRET, Antoine	Strongly Magnetized Parallel Collisionless Shocks in Pair Plasmas
11:10	00:20	KHISHCHENKO, Konstantin	Equation of State for Bismuth at High Energy Densities
11:30	00:20	SPIRIN, Ivan	The Application of Synchrotron Radiation for Investigation of Detonation Excitation and Shock-Induced Particle Ejection from a Free Metal Surface
11:50	00:20	KRASIK, Yakov	Possible Applications of Underwater Electrical Wire Explosions in High Energy Density Physics
12:10	00:20	YAN, Zixiang	Scaling Law in the Velocity of Free Surface and its Applications in Experiments
12:30		Lunch break	
15:00	1:30	Poster Session II	
Session 12: Fusion Energy (Chair: Dominik Kraus)			
17:00	00:30	FERNÁNDEZ, Juan C.	The Grand Challenge of Inertial Fusion Energy
17:30	00:30	ROTH, Markus	Proton Driven Fast Ignition and Inertial Fusion Energy
18:00	00:20	CSERNAI, Laszlo	Developments in Nano Fusion
18:20			End of Day

Friday (February 4th)

Start	Duration	Speaker	Title
Session 13: LPA, Laser Technology and Diagnostics (Chair: Vincent Bagnoud)			
08:30	00:20	OHLAND, Jonas B.	Implementation of an On-Shot Focal Spot Optimization Loop at PHELIX
08:50	00:20	EFREMOV, Vladimir	Key physical processes during laser action in condensed and hollow silica-based optical fibers
09:10	00:20	RÖDER, Simon	Influence of the Stretcher Beam Size on the Temporal Contrast of Short Laser Pulses in CPA Laser Systems
09:30	00:20	ZOBUS, Yannik	A Millijoule Ultrafast Optical Parametric Amplifier for the PHELIX and PENELOPE Frontends
09:50	00:20	EFTEKHARI-ZADEH, Ehsan	Relativistic Interaction of Ultra-High Contrast Femtosecond Laser Pulses with low-Z Core, high-Z Shell Composite Nanowire Arrays
10:10	00:20	WEI, Wenqing	All-Optical Ultrafast Spin Rotation for Pre-Polarized Charged Particle Beams
10:30	00:20	Coffee break	
Session 14: Laser Matter Interactions (Chair: Abel Blazevic)			
10:50	00:20	CHENG, Rui	Research Progress of Ion Beam – Plasma Interactions at HIRFL – A Key Issue for HED @ HIAF
11:10	00:20	SHI, YuanFeng	Investigating the Electron Collisional Dynamics Through Non-Thermal Electron Distributions
11:30	00:20	LIU, Yun	Molecular Dynamics Investigation of the Stopping Power of Warm Dense Hydrogen for Electrons
11:50	00:20	NAZARY, Haress	Energy Loss Measurements with Laser Generated Ions
12:10	00:20	KOSTENKO, Oleg	Modeling of Generation of Characteristic X-Ray Radiation Under Vacuum Heating of Electrons of Nanocylinders
Session 15: LPA and WDM Diagnostics (Chair: Kurt Schoenberg)			
16:00	00:20	BELIKOV, Roman	Multi-Wavelength Pyrometer for Warm Dense Matter Temperature Measurements
16:20	00:20	VEYSMAN, Mikhail	A Model for Optical Diagnostics of the Spectrum of Electrons Accelerated in Laser Plasma
16:40	00:20	GERLACH, Sonja	Ionoacoustics for Particle Beam Monitoring: The I-BEAT Detector
17:00	00:20	DOYLE, Leonard	Monitoring Charge State Distributions of Residual Gas Ionization by High Intensity Laser Pulses
17:20		SCHOENBERG/BAGNOUD	Conclusion and End of Workshop

Poster session 1 (Wednesday, 15:00-16:30)

W1	YANG, Yang	Research Progress of Ultrafast Photoelectric Diagnostics in XIOPM CAS and Its Application Prospect in HED Physics
W2	MA, Bubo	Laboratory Observation of C and O Emission Lines of the White Dwarf H1504+65-like Atmosphere Model
W3	CHACON RUBIO, Francisco	Warm Dense Matter Analysis Through Hydrodynamics and Stopping Power
W4	KHURCHIEV, Aiush	Calibration of Image Plates for Pulsed Plasma Diagnostic
W5	GAVRILIN, Roman	Stopping Power Measurement for 100 KEV/U FE Ions in Hydrogen Plasma
W6	CHINTALWAD, Sachin	Photon Emission Enhancement Studies from the Interaction of Ultra-Intense Laser Pulse with Shaped Targets
W7	KUMAR, Punit	Filamentation In Spin Polarized Magnetized Quantum Plasma
W8	KRASIK, Yakov	Compact High-Current Pulse Generator for Laboratory Studies of High Energy Density Matter
W9	HUMPHRIES, Oliver	Characterizing the Ionization Potential Depression in Dense Plasmas with High-Precision Spectrally Resolved X-ray Scattering
W10	CHEN, Lei	Effect of Viscosity on Stopping Power for a Charged Particle Moving Above Two-Dimensional Electron Gas
W11	PAPP, Istvan	Particle Simulations for Nanoplasmonic Laser Induced Fusion Experiments
W12	POSOR, Dustin Jonas	Wavefront Measurement Using Beams with Orbital Angular Momentum: Preliminary Investigations
W13	TAVANA, Parysatis	Diagnostic of Laser-Accelerated MeV Proton Beams from Near Critical Density Foam Targets Using Nuclear Activation Technique and Radiochromic Film Imaging Spectroscopy
W14	MARTYNENKO, Artem	Optimization of a Laser-Plasma-Based Hard X-Ray Source for Absorption Spectroscopy Diagnostic of Warm Dense Matter
W15	LIPP, Vladimir	Applying Density Functional Tight Binding Approach to Study X-Ray-Induced Phase Transitions in Solids
W16	KANTSYREV, Alexey	High Energy Density Science at ITEP

Poster session 2 (Thursday, 15:00-16:30)

T1	GONZÁLEZ-GALLEGO SÁNCHEZ-CAMACHO, Luis	Experimental and Simulated Energy Loss in Magnetized Plasmas
T2	CHEN, Benzhen	Research on the Energy Loss Increase of Intense Proton Beams in Plasma
T3	REN, Jieru /MA, Bubo	Charge State Evolution of Laser-Accelerated Carbon Ions in Dense Ionized Matter
T4	JATAV, Bheem Singh	Kinetic Alfvén Wave to Study Solar Coronal Heating
T5	QU, Chongbing	Chemical Properties of Mixtures at WDM Conditions Characterized by Precise Spectroscopy Methods
T6	SKOBLIAKOV, Aleksei	Numerical Simulation of Experiments for X-Ray Diagnostics of Pulsed Plasma
T7	BARABANOV, Mikhail	Probing of Exotic States in Hadron and Heavy Ion Collisions
T8	LEVASHOV, Pavel	Wide-Range Models of Transport and Optical Properties for Subpicosecond Laser-Metal Interactions: Current Status and Problems
T9	RODRIGUES, Gerard	Stripping of Heavy Ion Beams Using Laser Ablated and Pinch Plasmas
T10	KRASIK, Yakov	The Non-Linear Complete Absorption Phenomenon for High-Power Microwave in a Plasma Filled Waveguide
T11	RANJAN, Divyanshu	Characterising Insulator-Metal Transition of Hydrogen with Spectrally Resolved X-Ray Scattering
T12	ZHANG, Jia	Energy Relaxation and Electron Phonon Coupling in Laser-Excited Metals
T13	CIKHARDT, Jakub	Experimental Investigation of the Sub-Picosecond Laser Interaction with Low Density Foams on the PHELIX Laser System
T14	GYRDYMOV, Mikhail	Generation of High Energy Electrons and Protons in Interaction of Relativistic Laser Pulse with Foams of Sub-mm Thickness
T15	EHRET, Michael	EMP Measurements at VEGA
T16	KAMBOJ, Oriza	Stimulated Raman Scattering Coupled with Decay Instability in a Magnetized Plasma with Hot Drifting Electrons