

Workshop on Plasma Physics at FAIR

Final Program

Monday (*Main Lecture Hall of GSI*)

8:15 –8:45: Registration

8:45 - 9:00: Welcome address (D. Hoffmann and V. Bagnoud)

9:00 – 10:15 Opening of the workshop (the status of FAIR) – Chair: V. Bagnoud

- ***News from FAIR Project and Experiments (20' + 5')***
 - Boris Sharkov, FAIR, Germany
- ***Plasma physics at FAIR (20' + 5')***
 - David Riley, Queens University, UK
- ***The experimental facility for Plasma Physics at FAIR (20'+5')***
 - Abel Blazevic, GSI Darmstadt, Germany

10:15 – 10:45 Coffee Break

10:45-12:00 HED Physics – Chair: D. Hoffmann

- ***Theoretical Challenges in Dense Matter Physics (20'+5')***
 - Dirk Gericke, University of Warwick, UK
- ***HIB for study of anomalous thermodynamics regions in hot dense matter (20'+5')***
 - Igor Iosilevskiy, JIHT, Russia
- ***EOS of matter at extreme conditions (20'+5')***
 - Igor Lomonosov, IPCP, Russia

12:00 – 13:30 LUNCH Break (Conference Photo)

13:30-15:30 Contributions from participants: HED and WDM – Chair: D. Gericke

- ***Russian contribution at PP@FAIR (20'+5')***
 - Alexander Golubev, ITEP, Moscow, Russia
- ***Ab initio thermodynamic results for warm dense matter (15'+5')***
 - Michael Bonitz, Kiel University, Germany
- ***Calculation of plasmon-damping within X-ray Thomson scattering on isochorically heated warm dense aluminum (15'+5')***
 - Bastian Witte, Rostock University, Germany
- ***Statistical plasma properties via classical molecular dynamics simulations (15'+5')***
 - Annette Calisti, PIIM, France

- ***An Entropic Approach to Magnetized Nonlocal Transport and Other Kinetic Phenomena in High-Energy-Density Plasmas (15'+5')***
 - Dario Del Sorbo, University of York, UK
- ***Latest developments on the dynamic properties of Coulomb and Yukawa OCPs (15'+5')***
 - Igor M. TKACHENKO, Univ. Politecnica de Valencia, Spain

15:30 – 16:50 Coffee Break with Poster Session (KBW Foyer)

17:00- 19:00 Ion beam facilities and Discussion round I – Chair: D. Varentsov

- ***Status of PRIOR (15'+5')***
 - Dmitry Varentsov, GSI Darmstadt, Germany
- ***High-energy proton imaging for biomedical applications (15'+5')***
 - Matthias Prall, GSI Darmstadt, Germany
- ***Compressed, Short-Pulse Ion Beams at the Neutralized Drift Compression Experiment (15'+5')***
 - Peter Seidl, LBNL, USA
- ***Discussion round I: Physics with PRIOR (18:00 – 19:00)–***
 - Moderator: Dmitry Varentsov

19:30- 21:00 Welcome reception and dinner (GSI Guest house)

Tuesday *(KBW Building, room 1.17)*

9:00-10:40 The international landscape of HED/WDM physics research

Chair: A. Golubev

- **Landscape in Europa/France (20'+5')**
 - Vladimir Tikhonchuck, Univ. Bordeaux I, France
- **Landscape in America (20'+5')**
 - Thomas Mehlhorn, Naval Research Lab., USA
- **Ion Beams and Nonideal Plasma: the landscape in Russia (20'+5')**
 - Victor Mintsev, ICPC, Russia
- **Status and perspective of large scale heavy ion facilities in China (20'+5')**
 - Guoqing Xiao, Lanzhou, China

10:40– 11:00 Coffee Break

11:00-12:40 HED/WDM facilities worldwide – Chair: M. Roth

- **HED research with XFELs (20'+5')**
 - Thomas Cowan, HZDR, Germany
- **Generation and Characterization of Dense Plasmas at the NIF (20'+5')**
 - Tilo Doepfner, LLNL, USA
- **The academic science program at LMJ/PETAL (20'+5')**
 - Dimitri Batani, Univ. Bordeaux I, France
- **BELLA-i - a facility for high energy density plasma science at Berkeley Lab (20'+5')**
 - Thomas Schenkel, LBNL, USA

12:40 – 13:45 LUNCH Break

13:45-14:35 more on FAIR – Chair: A. Blazevic

- **The FAIR Accelerator (20'+5')**
 - Peter Spiller, GSI Darmstadt, Germany
- **Possible FAIR - MaRIE collaborations in HED Science (20'+5')**
 - Kurt Schönberg, LANL, USA

14:35-16:30 Discussion and brainstorming on FAIR day-one experiments

- **Moderators: Paul Neumayer, Olga Rosmej, Dmitry Varentsov**
- **14:35 – 15:35 Experiments with Heavy Ion Beams (all speakers 10' + 5')**
 - Heavy-Ion Beam Driven Planar Isentropic Compression (Speaker: D. Varentsov for E. Brambrink)
 - The Critical Point Region Experiments (Speaker: I. Lomonosov)
 - Stimulated Mach Configuration by Intense Heavy Ion Beams (Speaker: D. Nikolaev)
 - In-situ X-ray Diffraction from Heavy-Ion Heated Carbon Allotropes + Continuum Lowering in the Low-Density Limit (Speaker: P. Neumayer)
- **Short break or group discussion (10')**
- **15:45 – 16:30 Experiments with Proton Beams (all speakers 10' + 5')**

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- Laser-Driven Shock Wave Loading of Solids (Speaker: M. Roth)
- Phase Transitions in Compressed Planetary Liquids (Speaker: D. Nikolaev)
- Material Surface and Bulk Shock Wave Loading by a Light Gas Gun (Speaker: A. Zubareva and M. Endres)

16:30 – 17:00 Coffee Break

17:00- 19:00 Discussion group II

- 17:00 – 18:00 interdisciplinary aspects - Moderator: Thomas Kühl
- 18:00 – 19:00 Isentropic Compression – Moderator: Olga Rosmej

20:00-22:30 Workshop dinner (Weißer Schwan)

Wednesday *(Main Lecture Hall of GSI)*

9:00-10:00 Laser-based plasma physics I – Chair: Th. Kühl

- **High-energy plasma diagnostics at FAIR (15'+5')**
 - Markus Roth, TU Darmstadt, Germany
- **Planned Laser Infrastructure for the APPA Cave (15'+5')**
 - Vincent Bagnoud, GSI Darmstadt, Germany
- **Laser sources of high energy electrons and hard X-rays for diagnostics of non-ideal plasmas (15'+5')**
 - Nikolay Andreev, JIHT, Russia

10:00 – 11:00 Discussion group III – Isochoric heating capabilities at FAIR –

- Moderator: Paul Neumayer

11:00 – 11:30 Coffee Break

11:30-12:10 Laser-based plasma physics II – Chair: D. Riley

- **Dynamic warm dense matter research with x-ray free electron lasers (15'+5')**
 - Dominik Kraus, HZDR, Germany
- **Neutronless reactions in laser plasmas. (15'+5')**
 - Valery Lisitsa, Kurchatov Institute, Russia

12:10 -13:00 Workshop summary

- (15') Tom Mehlhorn – Feedback from the advisory committee
- Discussion group summary: all moderators

13:00 Lunch at GSI Cantine

15:00 - 18:00 Discussion on the founding of a new plasma physics collaboration at FAIR/GSI