

*Conference Program, March 1, 2023*

*Round Table 18:00*

Chairman

*Dr. K. V. Khishchenko*

18:00–

**ROUND TABLE**

19:00

Interaction of intense energy fluxes with matter: Studies under extreme conditions

XXXVIII Fortov International Conference on  
Interaction of Intense Energy Fluxes with Matter  
March 1–6, 2023, Elbrus, Kabardino-Balkaria, Russia

IIEFM 2023

*Conference Program, March 2, 2023*

*Opening Ceremony 14:30*

Introduction by K. V. Khishchenko

Chairperson

*Prof. G. V. Shpatakovskaya*

- 14:45 Models of thermodynamics of materials in a wide range of pressures and temperatures (plenary)  
*Khishchenko Konstantin Vladimirovich (JIHT RAS, Moscow, Russia)*
- 15:15 Technological applications of laser shock physics (plenary)  
*Inogamov Nail Alimovich (VNIIA(S), Moscow, Russia), Zhakhovsky V. V., Petrov Y. V., Khokhlov V. A., Perov E. A., Kolobov Y. R., Nelasov I. V., Manokhin S. S., Shepelev V. V., Fortova S. V.*
- 15:45 The overview of scientific directions and achievements of the institute of laser technologies, ITMO university  
*Veiko Vadim Pavlovich (ITMOU, Saint-Petersburg, Russia), Odintsova G. V.*
- 16:00 Phase transformations in a strong short laser shock wave  
*Khokhlov Victor Alexandrovich (ITP RAS, Chernogolovka, Russia), Inogamov N. A., Petrov Y. V., Murzov S. A., Zhakhovsky V. V., Ashitkov S. I., Manokhin S. S., Nelasov S. S., Kolobov Y. R.*
- 16:15 Control of dipole–dipole interactions in dense resonance medium by fast switching of optical excitation using intense laser radiation  
*Bobrov Andrei Alexandrovich (JIHT RAS, Moscow, Russia), Saakyan S. A., Sautenkov V. A., Vilshanskaya E. V., Zelener B. B.*


16:30  **CONFERENCE PHOTO (OUTSIDE)**

16:45  **COFFEE-BREAK**

Chairman

*Prof. P. R. Levashov*

- 17:00 Laser-induced Frenkel interstitial-vacancy pairs in diamond: Life in couple or apart?  
*Kudryashov Sergey Ivanovich (LPI RAS, Moscow, Russia)*
- 17:15 Structural transformations of atomic nitrogen during bulk femtosecond laser micromarking of natural diamond  
*Kuzmin Evgeny Viktorovich (LPI RAS, Moscow, Russia), Rimskaya E. N., Danilov P. A., Kudryashov S. I., Kriulina G. U.*
- 17:30 Polarization-sensitive laser photoexcitation and filamentation in diamond  
*Krasin George Konstantinovich (LPI RAS, Moscow, Russia), Gulina Y. S., Kuzmin E. V., Kudryashov S. I.*

- 17:45 Laser accelerator for radiation hardness assessment of microelectronic devices  
*Safronov Konstantin Vladimirovich (FSUE RFNC-VNIITF, Snezhinsk, Russia), Flegentov V. A., Gorokhov S. A., Shamaeva N. N., Bashkin D. I., Tischenko A. S., Zamuraev D. O., Shamraev A. L., Kovaleva S. F., Fedorov N. A., Potapov A. V., Dubrovskikh S. M., Pilipenko A. S., Kustov A. S., Shibakov E. A.*
- 18:00 Intense laser sources of gamma radiation and neutrons based on high-current beams of super-ponderomotive electrons  
*Andreev N. E., Umarov Iskander Rashidovich (JIHT RAS, Moscow, Russia), Popov V. S.*
- 18:15 Multi-stage laser-plasma acceleration of ultrashort bunches of electrons and positrons  
*Veysman Mikhail Efimovich (JIHT RAS, Moscow, Russia), Umarov I. R., Pugacheva D. V., Andreev N. E.*
- 18:30 Ultrabright synchrotron radiation generated during the propagation of multipetawatt laser pulse in the self-trapping regime  
*Vais Olga Evgen'evna (VNIIA(S), Moscow, Russia), Lobok M. G., Bychenkov V. Yu.*
- 18:45 Experimental and theoretical investigation of emission spectra of aluminum targets irradiated by picosecond laser pulses  
*Ovechkin Anton Aleksandrovich (FSUE RFNC-VNIITF, Snezhinsk, Russia), Loboda P. A., Karlykhanov N. G., Nosulenko D. S., Vikhlyaev D. A., Gavrilov D. S., Borisov E. S., Devyatkov S. D., Emelyanov A. V., Pakhomov S. N., Pryakhina E. A., Potapov A. V., Titarenko N. Y.*
- 19:00  **SUPPER**
- 20:00–  
23:00 **POSTER SESSION**

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*Conference Program, March 3, 2023*

*Oral Session 14:30*

Chairman


*Prof. S. I. Kudryashov*

- 14:30 Semiclassical self-consistent and thermodynamically consistent average atom model (plenary)  
*Levashov Pavel Remirovich (JIHT RAS, Moscow, Russia), Dyachkov S. A., Polyukhin A. S.*
- 15:00 Laser-plasma bremsstrahlung source for high density objects radiography  
*Flegentov Vladimir Aleksandrovich (FSUE RFNC-VNIITF, Snezhinsk, Russia), Safronov K. V., Shamaeva N. N., Gorokhov S. A., Borisov E. S., Gavrilov D. S., Titarenko N. Yu., Potapov A. V.*
- 15:15 Electron acceleration and efficient THz generation from TW laser driven surface plasma  
*Nazarov Maxim Michailovich (NRC KI, Moscow, Russia), Shcheglov P. A., Mitrofanov A. V., Margushev Z. Ch., Rozhko M. V., Sidorov-Biryukov D. A.*
- 15:30 Powerful laser-produced unipolar THz pulses  
*Brantov Andrey Vladimirovich (LPI RAS, Moscow, Russia), Kuratov A. S., Lobok M. G., Bychenkov V. Yu.*
- 15:45 Effects of radiation generation during the interaction of high-energy electron beams with ordered nanostructures  
*Karpov Maxim Aleksandrovich (LPI RAS, Moscow, Russia), Tcherniega N. V., Shevchenko M. A., Umanskaya S. F., Mironova T. V., Kleopova N. A., Kudryavtseva A. D.*
- 16:00 Features of the laser induced breakdown spectrometry method in the study of ordered submicron systems based on synthetic opal matrices  
*Shevchenko Mikhail Aleksandrovich (LPI RAS, Moscow, Russia), Umanskaya S. F., Tcherniega N. V., Maresev A. N.*
- 16:15 Calculation of the transport properties of metals under non-equilibrium heating  
*Smirnov Nikolay Aleksandrovich (FSUE RFNC-VNIITF, Snezhinsk, Russia), Ovechkin A. A.*
- 16:30 Collective effects in active colloidal systems of complex composition under the action of laser radiation  
*Senoshenko Rada Vladimirovna (JIHT RAS, Moscow, Russia), Kononov E. A., Vasiliev M. M., Petrov O. F.*
- 16:45  **COFFEE-BREAK**

Chairman

*Prof. V. V. Stegailov*

- 17:00 Non-thermal impact by ultrashort super high power electromagnetic pulses on cell structures of the living body  
*Gulyaev Yu. V., Cherepenin V. A., Pavlyukova Elena Railevna (IRE RAS, Moscow, Russia)*

- 17:15 Structure of elastoplastic shock wave in porous copper on the partial pores compaction limit  
*Murzov S. A., Zhakhovsky Vasily Viktorovich (VNIIA(S), Moscow, Russia), Parshikov A. N., Dyachkov S. A.*
- 17:30 Damage-failure transition in aluminum AlMg6 alloy under consecutive dynamic and very high cycle fatigue loads  
*Naimark Oleg Borisovich (ICMM UB RAS, Perm, Russia), Bannikov M. V., Oborin V. A., Bayandin Yu. V., Savinykh A., Garkushin G., Razorenov S.*
- 17:45 Self-similar response of condensed matter under intensive loading  
*Bannikova Irina Anatolevna (ICMM UB RAS, Perm, Russia), Uvarov S. V., Bayandin Yu. V., Naimark O. B.*
- 18:00 Shock-wave methods for studying the properties of materials and the development of modern machine tool construction  
*Novikov S. V., Rostilov T. A., Ziborov Vadim Serafimovich (JIHT RAS, Moscow, Russia)*
- 18:15 Heterodyne velocity measurements (PDV) in media with rapidly changing refractive index  
*Gamov Artemiy L'vovich (FSUE RFNC-VNIIEF, Sarov, Russia), Tagirov R. R., Chudakov E. A., Blikov A. O., Bakulina E. A., Kulygina O. N.*
- 18:30 Initiation of low-density mixtures of PETN and nanodispersed aluminum by nanosecond laser pulses  
*Gluschenko A. G., Surov Mikhail Sergeevich (FSUE RFNC-VNIITF, Snezhinsk, Russia), Bakirov A. R., Sdobnov V. I., Stankevich A. V., Garmashev A. Yu., Griбанov D. A., Dolgikh S. M., Petrov D. V.*
- 18:45 Investigation of the dynamic properties of materials under intense pulsed impacts  
*Kanel G. I., Razorenov S. V., Utkin A. V., Mochalova V. N., Petrovtsev A. V., Shalkovsky D. M., Varfolomeev D. A., Dremov V. V., Kozlov E. A., Tarzhanov V. I., Yusupov D. T., Mokrushin S. S., Kazakov D. N., Anikin N. B., Nogin V. N., Balabin S. I., Belyaev D. A., Malyugin S. N., Taluts N. I., Dobromyslov A. V., Sagaradze V. V., Kataeva N. V., Shestakov A. E., Sedov A. V., Pavlenko Aleksandr Valerievich (FSUE RFNC-VNIITF, Snezhinsk, Russia)*
- 19:00 Plasma parameters of explosive emission splashes of tungsten fuzz nanostructure  
*Tsvetoukh Mikhail Mikhailovich (LPI RAS, Moscow, Russia)*
- 19:15  **SUPPER**
- 20:00–  
23:00 **POSTER SESSION**

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*Conference Program, March 4, 2023*

*Oral Session 14:30*

Chairman

*Prof. O. B. Naimark*

- 14:30 Blast wave attenuation by rigid foam and detonation product absorption  
*Komissarov Pavel Vladimirovich (FRCCP RAS, Moscow, Russia), Basakina S. S.*
- 14:45 Flame instability development in the opened channel with counter-flow  
*Yakovenko Ivan Sergeevich (JIHT RAS, Moscow, Russia), Kiverin A. D., Medvedkov I. S.*
- 15:00 Flame dynamics in highly active acetylene-based mixtures in channels of various widths  
*Yarkov Andrey Vladimirovich (JIHT RAS, Moscow, Russia), Kiverin A. D., Yakovenko I. S.*
- 15:15 A simplified mathematical model for deflagration-to-detonation transition  
*Kasimov Aslan Ramazanovich (Skoltech, Moscow, Russia), Goldin A. Yu.*
- 15:30 Study of the state of matter in lunar impact craters based on high-resolution orbital photogrammetry  
*Shpekin Michael Ivanovich (KFU, Kazan, Russia), Arkhipova A. A.*
- 15:45 Approximation and replenishment of data on ion ionization potentials of superheavy elements  
*Shpatakovskaya Galina Vasilievna (KIAM RAS, Moscow, Russia)*
- 16:00 Reliable thermodynamic limit of a one-component plasma energy using angular-averaged Ewald potential  
*Demyanov Georgy Sergeevich (JIHT RAS, Moscow, Russia), Levashov P. R.*
- 16:15 Shock compressibility and Hugoniot temperature of  $\text{TiO}_2$  at pressure up to 2 TPa  
*Nikolaev Dmitry Nikolaevich (FRC PCP MC RAS, Chernogolovka, Russia), Gryaznov V. K., Lomonosov I. V.*
- 16:30 Simulation of boron carbide spherical shell behavior under explosive compression  
*Zabusov Pavel Vladimirovich (FSUE RFNC-VNIIEF, Sarov, Russia), Karpenko G. Ya., Kiryukhina M. N., Kovaldov V. V., Nefedov A. V., Panov K. N., Saprykina E. V., Shirshova M. O.*
- 16:45  **COFFEE-BREAK**

Chairman

*Prof. N. A. Inogamov*

- 17:00 Kinetics of plasma phase transition in dense fluid  $\text{H}_2$ : The analysis based on first-principles molecular dynamics (plenary)  
*Fedorov I. D., Stegailov Vladimir Vladimirovich (JIHT RAS, Moscow, Russia)*
- 17:30 Experimental investigation of thermal expansion of refractory metal carbide at fast pulse-heating and high temperatures  
*Senchenko Vladimir Nikolaevich (JIHT RAS, Moscow, Russia), Melnikov S. A., Kapustin D. I.*

- 17:45 Measurements of the thermal expansion coefficient of tungsten in the solid and liquid phases at pressures of 0.1–0.5 GPa  
*Kondratyev Arseniy Mikhailovich (JIHT RAS, Moscow, Russia), Rakhel A. D.*
- 18:00 The estimate of the critical point from a caloric equation of state  
*Rakhel Anatolii Dmitrievich (JIHT RAS, Moscow, Russia)*
- 18:15 Equations of state for liquid phases of molybdenum and tungsten with a small number of parameters  
*Boyarskikh Kseniya Aleksandrovna (JIHT RAS, Moscow, Russia), Khishchenko K. V.*
- 18:30 Modeling of shock-wave processes in the W–Ni–Cu system at high pressures and temperatures  
*Seredkin Nikolai Nikolaievich (JIHT RAS, Moscow, Russia), Khishchenko K. V.*
- 18:45– T-USPEX method for constructing a nitrogen phase diagram under extreme conditions  
19:00 *Bereznikova Liudmila Alexandrovna (MIPT, Dolgoprudny, Russia), Propad Y. V., Kruglov I. K.*
- 19:15–  **BANQUET**  
23:00

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*Conference Program, March 5, 2023*

*Oral Session 14:30*

Chairman

*Prof. L. G. Dyachkov*

- 14:30 *Ab initio* calculations of conductivity and optical properties of metals in the vicinity of the critical point: Zr and Pb as examples  
*Fokin Vladimir Borisovich (JIHT RAS, Moscow, Russia), Minakov D. V., Paramonov M. A., Levashov P. R.*
- 14:45 Can we call the transition between low-density and high-density amorphous ices as a first-order transition?  
*Shupletsova Anastasiia Aleksandrovna (JIHT RAS, Moscow, Russia), Stegailov V. V.*
- 15:00 Meshfree method for hybrid atomistic simulation of metals with hot electrons  
*Zhakhovsky Vasily Viktorovich (VNIIA(S), Moscow, Russia)*
- 15:15 Non-stationary plasma population kinetics included in-line in the radiative-hydrodynamic calculation  
*Kim Dmitrii Andreevich (KIAM RAS, Moscow, Russia), Vichev I. Yu., Solomyannaya A. D., Grushin A. S.*
- 15:30 Modeling of destruction of layered ceramic composite plates under shock-wave loads  
*Radchenko Andrey Vasilievich (ISPMS SB RAS, Tomsk, Russia), Batuev S. P., Radchenko P. A.*
- 15:45 On fracture waves in saturated double porosity medium  
*Izvekov Oleg Yaroslavovich (MIPT, Dolgoprudny, Russia), Konyukhov A. V., Izvekova Yu. N.*
- 16:00 Deformation dynamics of sapphire windows in the exploding foils experiments  
*Ivanov Artyom Vladislavovich (JIHT RAS, Moscow, Russia), Rakhel A. D.*
- 16:15 On the structure and stability of traveling wave solutions for the generalized Korteweg–de Vries–Burgers equation in a case of a flow function with four inflection points  
*Tomasheva Anastasia Mikhailovna (NRNU MEPhI, Moscow, Russia), Shargatov V. A.*
- 16:30 Stability of the liquid-gas contact interface in a porous medium described by a network model  
*Kozhurina Polina Ivanovna (NRNU MEPhI, Moscow, Russia), Gorkunov S. V., Shargatov V. A.*
- 16:45  **COFFEE-BREAK**

Chairman

*Prof. A. V. Radchenko*

- 17:00 Computer design of new electrolytes for solid-state batteries  
*Chepkasov Ilya Vasilyavich (Skoltech, Moscow, Russia), Maltsev A. P., Oganov A. R.*
- 17:15 Mechanisms of soot thermal decomposition: insights from reactive molecular dynamics  
*Potapov Denis Olegovich (MIPT, Dolgoprudny, Russia), Orekhov N. D.*
- 17:30 Universal properties of two-dimensional closely packed systems  
*Klumov Boris Aleksandrovich (JIHT RAS, Moscow, Russia)*



- 17:45 Some thermodynamic functions in an asymmetric complex plasma with regard to the nonlinear screening  
*Martynova Inna Aleksandrovna (JIHT RAS, Moscow, Russia), Iosilevskiy I. L.*
- 18:00 Dust particle rotation mechanisms in a glow discharge under the magnetic field action and their role in different ranges of magnetic field values  
*Dyachkov Lev Gavriilovich (JIHT RAS, Moscow, Russia), Dzlieva E. S., Novikov L. A., Pavlov S. I., Karasev V. Yu.*
- 18:15 Constriction of the positive column glow discharge in inert gases  
*Golubovskii Yuri Borisovich (SPbSU, Saint-Petersburg, Russia), Siasko A. V.*
- 18:30 Parameters of microexplosion processes on the cathode that occur during the initiation of vacuum breakdown  
*Oreshkin Evgeny Vladimirovich (LPI RAS, Moscow, Russia), Barendolts S. A., Oreshkin V. I., Khishchenko K. V.*
- 18:45 Discharge characteristics optimization of a pulsed plasma microaccelerator  
*Egoshin D. A., Fedorova Daria Konstantinovna (BMSTU, Moscow, Russia), Pavlov A. V., Novikov D. O., Protasov Yu. Yu., Telekh V. D.*
- 19:00– **CLOSING CEREMONY**
- 19:15 Concluding words by *K. V. Khishchenko*