

**17th International Workshop  
Complex Systems of Charged Particles and  
Their Interactions with Electromagnetic Radiation**

*Moscow, Russia, March 25-27, 2019*

**CONFERENCE PROGRAM**

**09:00-09:15** Opening Remarks

***SECTION-1 March 25 BASIC ASPECTS OF PLASMA SCIENCE (GPI RAS)***

09:15-09:45

**COMPLETE SEMI-PHENOMENOLOGICAL APPROACH TO PHOTOIONIZATION OF ENDOHEDRALS (*Invited*)**

M.Ya. Amusia<sup>1,2</sup>, L.V. Chernysheva<sup>2</sup>

<sup>1</sup>*Racah Institute of Physics, the Hebrew University, Jerusalem, Israel*

<sup>2</sup>*Ioffe Physical-Technical Institute of the Russian Academy of Sciences, St. Petersburg, Russian Federation*

09:45-10:15

**UNITING THE UNKNOWNNS WITH A PRECISE COHERENT INTERLOCKING SYSTEM OF SOLUTIONS (*Invited*)**

Charles K. Rhodes<sup>1,2</sup>

<sup>1</sup>*Laboratory for X-Ray Microimaging and Bioinformatics, Department of Physics, University of Illinois at Chicago, Chicago, IL 60607-7059, USA*

<sup>2</sup>*Ultrabeam Technologies, LLC, 237 East Delaware Place, Chicago, IL 60611, USA*

10:15-10:45

**DOUBLE IONIZATION AND SATELLITE EXCITATION IN SOFT AND HARD X-RAY REGIONS**

V.G. Yarzhemsky<sup>1,2</sup>, M.Ya. Amusia<sup>3,4</sup>

<sup>1</sup>*Kurnakov Institute of General and Inorganic Chemistry of the Russian Academy of Sciences, Moscow, Russia*

<sup>2</sup>*Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia*

<sup>3</sup>*Racah Institute of Physics, the Hebrew University, Jerusalem 91904, Israel*

<sup>4</sup>*Ioffe Physical-Technical Institute, St Petersburg 194021, Russia*

10:30-11:00

**DISSOCIATION OF QUARKONIUM BY A STRONG ELECTRIC FIELD IN THE QUARK-GLUON PLASMA (*Invited*)**

A.M. Ishkhanyan<sup>1</sup>, V.P. Krainov<sup>2</sup>

<sup>1</sup>*Institute for Physical Research, National Academy of Sciences of Armenia, Ashtarak, 0203 Armenia*

<sup>2</sup>*Moscow Institute of Physics and Technology, Dolgoprudny, Moscow oblast, 141700 Russia*

***SECTION-2 March 25 COMPLEX PLASMAS (GPI RAS)***

11:00-11:30

**EXOTIC IONS IN SUPERFLUID HELIUM (*Invited*)**

A.G. Khrapak

*Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia*

11:30-11:45

**COLLECTIVE ION DRAG FORCE**

A. M. Ignatov

*Prokhorov General Physics Institute of the Russian Academy of Sciences*

**11:45-12:15** Coffee Break

12:15-13:00

**FUNDAMENTAL INHOMOGENEITY OF A YUKAWA PLASMA IN A PARABOLIC TRAP**

V.S. Nikolaev<sup>1,2</sup>, A.V. Timofeev<sup>2,1</sup>

<sup>1</sup>Moscow Institute of Physics and Technology (State University), Moscow, Russia

<sup>2</sup>Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia

12:30-12:45

**SOLITARY WAVES IN A LONG STRUCTURE OF CHARGED DUST PARTICLES IN LINEAR ELECTRODYNAMIC TRAP**

R.A. Syrovatka, L.V. Deputatova, V.S. Filinov, V.Ya. Pecherkin, Yu.V. Medvedev, L.M. Vasilyak, and V.I. Vladimirov

Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia

12:45-13:15

**FEATURES OF FORMATION OF DUSTY PLASMAS IN A GLOW DISCHARGE IN STRONG MAGNETIC FIELD (Invited)**

V.Yu. Karasev, E.S. Dzlieva, S.I. Pavlov, L.A. Novikov

St.-Petersburg State University, 199034, Universitetskaya nab., 7/9, St. Petersburg, Russia

13:15-13:30

**THE FORCED ANHARMONIC OSCILLATIONS OF A SINGLE DUST PARTICLE IN A STRATIFIED GLOW DISCHARGE**

A.A. Kartasheva, Yu. B. Golubovskii, V.Yu. Karasev

Saint Petersburg State University, Saint-Petersburg, Russia

13:30-13:45

**UNDERSTANDING IONIC LOSSES IN ENERGY STORAGE FILMS**

Elshad Allahyarov<sup>1,2,3</sup>

<sup>1</sup>Joint Institute for High Temperatures, Russian Academy of Sciences, Moscow, Russia

<sup>2</sup>Theoretical Chemistry, Duisburg-Essen University, Essen, Germany

<sup>3</sup>Physics Department, Case Western Reserve University, Cleveland OH, USA

**13:45-15:00 Lunch**

15:00-15:30

**WAKEFIELD AROUND A DUST PARTICLE IN STREAMING PLASMAS AND DYNAMICS OF THE DUSTY PLASMAS IN EXTERNAL MAGNETIC FIELD (Invited)**

T.S. Ramazanov, K. N. Dzhumagulova, Zh. A. Moldabekov, A.R. Abdirakhmanov,

R.U. Masheeva, M.K. Dosbolayev, S.K. Kodanova

Al Farabi Kazakh National University, Institute of Experimental and Theoretical Physics, Republic of Kazakhstan

15:30-16:00

**DUSTY PLASMAS AT PHOBOS AND DEIMOS: EFFECTS OF METEOROIDS (Invited)**

S.I. Popel<sup>1,2,3</sup>, A.P. Golub<sup>1</sup>, L.M. Zelenyi<sup>1,2,3</sup>

<sup>1</sup>Space Research Institute of the Russian Academy of Sciences, Moscow, Russia,

<sup>2</sup>Moscow Institute of Physics and Technology (State University), Dolgoprudnyi, Moscow Region, Russia

<sup>3</sup>National Research University Higher School of Economics, Moscow, Russia

16:00-16:15

**SIZE DISTRIBUTION OF DUST GRAINS CREATED IN PLASMA-CHEMICAL REACTIONS INITIATED BY THE MICROWAVE RADIATION OF A GYROTRON IN REGOLITH**

V.Yu. Koroley<sup>1,2,3</sup>, N.N. Skvortsova<sup>4</sup>

<sup>1</sup>Faculty of Computational Mathematics and Cybernetics, Lomonosov Moscow State University, Russia

<sup>2</sup>Institute of Informatics Problems, Federal Research Center «Computer Science and Control», Russian Academy of Sciences, Moscow, Russia

<sup>3</sup>Hangzhou Dianzi University, Hangzhou, China

<sup>4</sup>Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

16:15-16:30

**DUSTY STRUCTURES AND CHAIN REACTIONS INITIATED IN REGOLITH BY PULSED RADIATION OF THE GYROTRON**

N.N. Skvortsova<sup>1</sup>, S.A. Mayorov<sup>1,2</sup>, D.V. Malakhov<sup>1,3</sup>, V.D. Stepakhin<sup>1,3</sup>, E.A. Obratsova<sup>4</sup>, A.S. Sokolov<sup>5</sup>, O.N. Shishilov<sup>5</sup>

<sup>1</sup>*Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia*

<sup>2</sup>*Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia*

<sup>3</sup>*Pirogov Russian National Medical University, Moscow, Russia*

<sup>4</sup>*M.M. Shemyakin and Yu.A. Ovchinnikova Institute of Bioorganic Chemistry of the Russian Academy of Sciences, Russia*

<sup>5</sup>*Russian Technological University «MIREA», Moscow, Russia*

16:30-16:45

**STABILITY OF THE DUST CRYSTAL IN LOW-PRESSURE RF GAS DISCHARGE**

D.I. Zhukhovitskii

*Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia*

**16:45-17:15 Coffee Break**

17:15-17:30

**CHARGED PARTICLES OF DUST, ELECTRICAL DISCHARGES AND THE GENERATION OF VORTICES IN THE ATMOSPHERES OF PLANETS**

O.A. Sinkevich<sup>1</sup> and N.G. Gusein-zade<sup>2</sup>

<sup>1</sup>*National Research University «MPEI»*

<sup>2</sup>*Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia*

17:30-17:45

**FAST ROTATION OF THE DUST STRUCTURE UNDER ACTION OF A STRONG MAGNETIC FIELD IN THE REGION OF THE NARROWING OF THE DC GLOW DISCHARGE CURRENT CHANNEL**

L.G. Dyachkov<sup>1</sup>, E.S. Dзлиeva<sup>2</sup>, M.A. Ermolenko<sup>2</sup>, L.A. Novikov<sup>2</sup>, S.I. Pavlov<sup>2</sup>, V.Yu. Karasev<sup>2</sup>

<sup>1</sup>*Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia*

<sup>2</sup>*Saint-Petersburg State University, Saint-Petersburg, Russia*

17:45-18:00

**WAVE PROCESSES IN DUSTY PLASMAS AT MARTIAN SATELLITES**

T.I. Morozova<sup>1,2</sup>, S.I. Kopnin<sup>1,2,3</sup>, S.I. Popel<sup>1,2,3</sup>

<sup>1</sup>*Space Research Institute of the Russian Academy of Sciences, Moscow, Russia*

<sup>2</sup>*Moscow Institute of Physics and Technology (State University), Dolgoprudnyi, Moscow region, Russia*

<sup>3</sup>*National Research University Higher School of Economics, Moscow, Russia*

18:00-18:15

**CONDENSATION PROCESSES AND DUSTY PLASMA FORMATION IN MARTIAN IONOSPHERE**

Yu.S. Reznichenko<sup>1,2</sup>, A.Yu. Dubinskii<sup>1</sup>, S.I. Popel<sup>1,2,3</sup>

<sup>1</sup>*Space Research Institute of the Russian Academy of Sciences, Moscow, Russia,*

<sup>2</sup>*Moscow Institute of Physics and Technology (State University), Dolgoprudnyi, Moscow region, Russia,*

<sup>3</sup>*National Research University Higher School of Economics, Moscow, Russia*

18:15-18:30

**AN INTERACTION OF CHARGED PARTICLES WITH DUST-ACOUSTIC SOLITON**

F.M. Trukhachev<sup>1,2</sup>, M.M. Vasiliev<sup>1,3</sup>, O.F. Petrov<sup>1,3</sup>

<sup>1</sup>*Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia,*

<sup>2</sup>*State Institution of Higher Professional Education "Belarusian-Russian University, Mogilev, Belarus*

<sup>3</sup>*Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia*

18:30-18:45

**INVESTIGATION OF THE DYNAMICS OF DUST-PLASMA FORMATIONS IN A PULSED PLASMA ACCELERATOR**

M.K. Dosbolaev, Zh.R. Rayimkhanov, A.B. Tazhen, T.T. Ramazanov

***International Workshop «Complex Systems of Charged Particles and Their Interactions with Electromagnetic Radiation» (GPI RAS)***

**&**

***International Workshop «Advances in X-ray Diagnostics for Plasma Physics and High Energy Density Science» (NRNU MEPhI)***

**In memory of Professor Anatoly Ya. Faenov**

***SECTION-3 March 26 LASER PLASMAS (GPI RAS)***

**09:00-09:15 Opening Remarks to Faenov Memorial Session (GPI/MEPHI) M.Yu. Romanovskiy**

09:15-09:45

**MODELING THE INTERACTION OF AN ULTRA-HIGH INTENSITY LASER PULSE WITH NANOSTRUCTURED TARGETS (*Invited*)**

O. Budrigă<sup>1</sup>, E. d'Humières<sup>2</sup>, L. Ionel<sup>1</sup>, M. Martiş<sup>1</sup> and M. Carabaş<sup>3</sup>

<sup>1</sup>*National Institute for Laser, Plasma and Radiation Physics, Măgurele, Romania*

<sup>2</sup>*Université de Bordeaux - CNRS - CEA, CELIA, Talence, France*

<sup>3</sup>*University POLITEHNICA of Bucharest, Bucharest, Romania*

09:45-10:00

**SEMI-EMPIRICAL ANALITICAL MODEL FOR FINDING THE SHOCK ADIABATE OF METALLS BY THE CHARACTERISTICS OF THE SHOCK WAVE ATTENUATION IN THE LASER EXPERIMENTS**

S.Yu. Gus'kov<sup>1</sup>, I.K. Krasnyuk<sup>1,2</sup>, A.Yu. Semenov<sup>2</sup>, I.A. Stuchebrukhov<sup>1,2</sup>, K.V. Khishchenko<sup>3</sup>

<sup>1</sup>*P.N. Lebedev Physical Institute of RAS, Moscow, Russia*

<sup>2</sup>*A.M. Prokhorov General Physics Institute of RAS, Moscow, Russia*

<sup>3</sup>*Joint Institute for High Temperatures of RAS, Moscow, Russia*

10:00-10:15

**MODEL OF HIGH-SPEED SMOOTH LASER CUTTING TRANSPARENT MATERIALS**

V.N. Tokarev

*Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia*

10:15-10:30

**DIAGNOSTICS OF ULTRAHIGH LASER INTENSITIES WITH TUNNEL IONIZATION OF HEAVY ATOMS**

S.V. Popruzhenko<sup>1</sup>, M. Ciappina<sup>2</sup>, S.V. Bulanov<sup>2</sup>, G. Korn<sup>2</sup>, T. Ditmire<sup>3</sup>, S. Weber<sup>2</sup>

<sup>1</sup>*Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia,*

<sup>2</sup>*Institute of Physics of the ASCR, ELI-Beamlines project, Prague, Czech Republic*

<sup>3</sup>*University of Texas at Austin, USA*

10:30-10:45

**THE EMISSION OF TERAHERTZ WAVES AT THE INTERACTION OF TWO COUNTERPROPAGATING LASER PULSES IN UNDERDENSE PLASMA**

A.A. Frolov

*Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia*

10:45-11:00

**SIMULATIONS OF HARD X-RAYS GENERATION BY HOT ELECTRONS IN A SILVER TARGET**

O.F. Kostenko

*Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia*

11:00-11:30

**X-RAY DIAGNOSTICS OF HYDRODYNAMIC PHENOMENA IN LASER-INDUCED ASTROPHYSICALLY-RELEVANT PLASMA (Invited)**

E.D. Filippov<sup>1</sup>, I.Yu. Skobelev<sup>1,2</sup>, S.N. Ryazantsev<sup>1</sup>, G. Revet<sup>3,4</sup>, S.N. Chen<sup>5</sup>, J. Fuchs<sup>3,4</sup> and S.A. Pikuz<sup>1,2</sup>

<sup>1</sup>Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia,

<sup>2</sup>National Research Nuclear University MEPhI, Moscow, Russia,

<sup>3</sup>LULI-CNRS, École Polytechnique, CEA: Université Paris-Saclay; Palaiseau cedex, France.

<sup>4</sup>Institute of Applied Physics, RAS, 46 Ulyanov Street, Nizhny Novgorod, Russia

<sup>5</sup>ELI-NP, «Horia Hulubei» National Institute for Physics and Nuclear Engineering, Bucharest-Magurele, Romania

**11:30-12:00 Coffee Break**

12:00-12:30

**COHERENT X-RAY EMISSION FROM RELATIVISTIC PLASMA SINGULARITIES (BISER) (Invited)**

A.S. Pirozhkov<sup>1</sup>, T.Zh. Esirkepov<sup>2</sup>, A. Sagisaka<sup>1</sup>, K. Ogura<sup>1</sup>, T.A. Pikuz<sup>2,3</sup>, A.Ya. Faenov<sup>2,3</sup>, B. González-Izquierdo<sup>1</sup>, J.K. Koga<sup>1</sup>, H. Kiriyama<sup>1</sup>, N. Nakanii<sup>1</sup>, K. Huang<sup>1</sup>, Y. Fukuda<sup>1</sup>, E.N. Ragozin<sup>4,5</sup>, D. Neely<sup>6,7</sup>, H. Daido<sup>8</sup>, Y. Kato<sup>9</sup>, K. Kondo<sup>1</sup>, T. Kawachi<sup>1</sup>, S. V. Bulanov<sup>1,10,11</sup>, and M. Kando<sup>1</sup>

<sup>1</sup>Kansai Photon Science Institute, QST, Kizugawa, Kyoto, Japan

<sup>2</sup>Open and Transdisciplinary Research Initiatives, Osaka University, Suita, Osaka, Japan

<sup>3</sup>Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia

<sup>4</sup>P. N. Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, Russia

<sup>5</sup>Moscow Institute of Physics and Technology (State University), Dolgoprudnyi, Russia

<sup>6</sup>Central Laser Facility, Rutherford Appleton Laboratory, STFC, Didcot, UK

<sup>7</sup>Department of Physics, SUPA, University of Strathclyde, Glasgow, UK

<sup>8</sup>Institute for Laser Technology, Osaka, Japan

<sup>9</sup>The Graduate School for the Creation of New Photonics Industries, Hamamatsu, Shizuoka, Japan

<sup>10</sup>Institute of Physics ASCR, v.v.i. (FZU), ELI-Beamlines Project, Dolní Břežany, Czech Republic

<sup>11</sup>Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

12:30-13:00

**STUDY OF BLAST WAVES GENERATED BY SHORT-PULSE HIGH-INTENSITY LASERS IN SOLIDS (Invited)**

D. Batani<sup>1</sup>, K. Jakubowska<sup>2</sup>, J.-F. Feugeas<sup>1</sup>, P. Forestier-Colleoni<sup>2</sup>, S. Hulin<sup>1</sup>, P. Nicolai<sup>1</sup>, A. Flacco<sup>2</sup>, B. Vauzour<sup>2</sup>, V. Malka<sup>2</sup>, J.J. Santos<sup>1</sup>

<sup>1</sup>Université Bordeaux, CNRS, CEA, CELIA (Centre Lasers Intenses et Applications), France

<sup>2</sup>Institute of Plasma Physics and Laser Microfusion - Hery Str. 23, 01-497 Warsaw, Poland

<sup>3</sup>LOA (ENSTA/CNRS/Ecole Polytechnique) - 828 Blvd. des Marechaux, 91762 - Palaiseau CEDEX, France

13:00-13:30

**IONIC CHARGE STATE DISTRIBUTION IN DENSE NON-MAXWELLIAN PLASMAS (Invited)**

F.B. Rosmej<sup>1,2</sup>

<sup>1</sup>Sorbonne University, Faculty of Sciences, Paris, France

<sup>2</sup>Ecole Polytechnique, Palaiseau, France

13:00-13:30

**LASER ELECTRON ACCELERATION FOR GAMMA-RAY AND THZ RADIATION SOURCES**

A.V. Brantov<sup>1,2</sup>, A.S. Kuratov<sup>1,2</sup>, Yu. M. Aliev<sup>1</sup>, M.G. Lobok<sup>1,2</sup> and V.Yu. Bychenkov<sup>1,2</sup>

<sup>1</sup>Lebedev Physics Institute of the Russian Academy of Sciences, Moscow, Russia

<sup>2</sup>Center of Fundamental and Applied Research, VNIIA, ROSATOM, Moscow, Russia

**13:45-15:00 Lunch**

15:00-15:40

**FAST PARTICLES GENERATION IN INTENSE LASER-PLASMA INTERACTIONS (Invited)**

N.E. Andreev

Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia

15:40-16:05

**REVIEW OF WHAT WE DID TOGETHER WITH ANATOLY FAENOV AND RECENT DIRECTIONS OF LASER-MATTER INTERACTION STUDIES (Invited)**

N.A. Inogamov

*Landau Institute for Theoretical Physics of the Russian Academy of Sciences, Chernogolovka, Russia*

16:05-16:30

**IN-SITU IMAGING AND CONTROL OF INTENSE SOFT AND HARD X-RAY FEL BEAMS BY FLUORESCENT DETECTORS WITH SUBMICRON RESOLUTION(Invited)**

S.S. Makarov<sup>1,6</sup>, S.A. Pikuz<sup>1</sup>, T.A. Pikuz<sup>1,2</sup>, A.Ya. Faenov<sup>1,2</sup>, A.N. Mitrofanov<sup>1</sup>, T. Matsuoka<sup>2</sup>, S. Matsuyama<sup>3</sup>, K. Yamauchi<sup>3</sup>, N. Ozaki<sup>3</sup>, Y. Inubushi<sup>4</sup>, M. Yabashi<sup>4,5</sup>, K. Tono<sup>4,5</sup>, Y. Sato<sup>3</sup>, H. Yumoto<sup>4</sup>, H. Ohashi<sup>4,5</sup>, A.N. Grum-Grzhimailo<sup>6</sup>, M. Nishikino<sup>7</sup>, T. Kawachi<sup>7</sup>, T. Ishikawa<sup>4,5</sup>, R. Kodama<sup>2</sup>.

<sup>1</sup>*Joint Institute for High Temperatures RAS, Moscow 125412, Russia*

<sup>2</sup>*Institute for Academic Initiatives, Osaka University, Suita, Osaka, 565-0871, Japan*

<sup>3</sup>*Graduate School of Engineering, Osaka University, Suita, Osaka 565-0871, Japan*

<sup>4</sup>*JASRI/SPring-8, Sayo-gun, Hyogo 679-5198, Japan*

<sup>5</sup>*RIKEN Harima Institute, Sayo, Hyogo 679-5148, Japan*

<sup>6</sup>*Skobel'syn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow 119991, Russia*

<sup>7</sup>*Quantum Beam Science Center JAEA, Kizugawa, Kyoto 619-0215, Japan*

16:30-16:45

**ULTRA-RELATIVISTIC Fe PLASMA WITH GJ/cm<sup>3</sup> ENERGY DENSITY CREATED BY FEMTOSECOND LASER PULSES**

M.A. Alkhimova<sup>1</sup>, A.Ya. Faenov<sup>1,2</sup>, T.A. Pikuz<sup>1,2</sup>, I.Yu. Skobelev<sup>1,3</sup>, S. A. Pikuz<sup>1,3</sup>, M. Nishiuchi<sup>4</sup>, H. Sakaki<sup>4</sup>, A. S. Pirozhkov<sup>4</sup>, A. Sagisaka<sup>4</sup>, N.P. Dover<sup>4</sup>, Ko. Kondo<sup>4</sup>, K. Ogura<sup>4</sup>, Y. Fukuda<sup>4</sup>, H. Kiriyama<sup>4</sup>, M. Kando<sup>4</sup>, R. Kodama<sup>2,5</sup>, K. Kondo<sup>4</sup>.

<sup>1</sup>*Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia, e-*

<sup>2</sup>*Institute of Open and Transdisciplinary Research Initiatives, Osaka University, Osaka, Japan*

<sup>3</sup>*National Research Nuclear University «MEPhI», Moscow, Russia*

<sup>4</sup>*Kansai Photon Science Institute(KPSI), National Institutes for Quantum and Radiological Science and Technology(QST), Kizugawa, Kyoto, Japan*

<sup>5</sup>*Institute of Laser Engineering, Osaka University, Osaka, Japan*

16:45-17:05

**X-RAY EMISSION AND ABSORPTION SPECTROSCOPY IN STUDIES OF ENERGY TRANSFER IN WARM DENSE LASER PLASMA**

S.N. Ryazantsev<sup>1</sup>, I.Y. Skobelev<sup>1,2</sup>, D.D. Arich<sup>1,2</sup>, P.S. Bratchenko<sup>1,2</sup>, A.Y. Faenov<sup>1,3</sup>, T.A. Pikuz<sup>1,3</sup>, P. Durey<sup>4</sup>, L. Doehl<sup>4</sup>, D. Farley<sup>4</sup>, C.D. Baird<sup>4</sup>, K.L. Lancaster<sup>4</sup>, C.D. Murphy<sup>4</sup>, N. Booth<sup>5</sup>, C. Spindloe<sup>5</sup>, P. McKenna<sup>6</sup>, S.B. Hansen<sup>7</sup>, J. Colgan<sup>8</sup>, R. Kodama<sup>3,9,10</sup>, N. Woolsey<sup>4</sup>, S.A. Pikuz<sup>1,2</sup>

<sup>1</sup>*Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia*

<sup>2</sup>*National Research Nuclear University «MEPhI», Moscow, Russia*

<sup>3</sup>*Open and Transdisciplinary Research Initiative, Osaka University, Osaka, Japan*

<sup>4</sup>*York Plasma Institute, Department of Physics, University of York, York, UK*

<sup>5</sup>*Central Laser Facility, STFC Rutherford Appleton Laboratory, Didcot, UK*

<sup>6</sup>*Department of Physics, SUPA, University of Strathclyde, Glasgow, UK*

<sup>7</sup>*Sandia National Laboratories, Albuquerque, USA*

<sup>8</sup>*Theoretical Division, Los Alamos National Laboratory, Los Alamos, USA*

<sup>9</sup>*Graduate School of Engineering, Osaka University, Osaka, Japan*

<sup>10</sup>*Institute of Laser Engineering, Osaka University, Suita, Osaka, Japan*

17:05-17:20

**SOLID-DENSITY EFFECTS IN TIME-INTEGRATED X-RAY EMISSION SPECTRA OF ULTRA-RELATIVISTIC LASER PLASMA**

A.S. Martynenko<sup>1,2</sup>, S.A. Pikuz<sup>1,2</sup>, I.Yu. Skobelev<sup>1,2</sup>

<sup>1</sup>*National Research Nuclear University «MEPhI», Moscow, Russia*

<sup>2</sup>*Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia*

**17:20-17:50 Coffee Break**

17:50-18:05

**ENHANCED EMISSION OF INTENSE TERAHERTZ WAVES FROM GAS TARGETS DRIVEN BY BICHROMATIC MIDINFRARED LASER PULSES**

S.V. Popruzhenko<sup>1</sup>, V. Tulsy<sup>2</sup>, M. Baghery<sup>3</sup>, U. Saalman<sup>3</sup>

<sup>1</sup>*Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia,*

<sup>2</sup>*Institute of Physics, University of Rostock, Germany,*

<sup>3</sup>*Max Planck Institute for the Physics of Complex Systems, Dresden, Germany*

18:05-18:20

**STOCHASTIC ELECTRON HEATING IN COMBINED LASER AND PLASMA FIELDS**

S.G. Bochkarev<sup>1,5</sup>, D.A. Gozhev<sup>1</sup>, E. d'Humieres<sup>2</sup>, V.T. Tikhonchuk<sup>2,3</sup>, Ph. Korneev<sup>4</sup>,

V.Yu. Bychenkov<sup>1,5</sup>

<sup>1</sup>*P.N. Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, Russia,*

<sup>2</sup>*CELIA, University of Bordeaux, CNRS, CEA, 33405 Talence, France,*

<sup>3</sup>*ELI-Beamlines, Institute of Physics, Czech Academy of Sciences, 25241 Dolní Břežany, Czech Republic*

<sup>4</sup>*National Research Nuclear University «MEPhI» (Moscow Engineering Physics Institute), Moscow, Russia*

<sup>5</sup>*Center for Fundamental and Applied Research, VNIIA, ROSATOM, Moscow, 127055, Russia*

18:20-18:35

**RADIATION OF ELECTRON IN THE FIELD OF CROSSED GAUSSIAN BEAMS**

A.V. Borovskiy<sup>1</sup>, A.L. Galkin<sup>2,3</sup>

<sup>1</sup>*Baikal State University, Department of Computer Science and Cybernetics, Irkutsk, Russia*

<sup>2</sup>*Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia*

<sup>3</sup>*Pirogov Russian National Research Medical University, Department of physics of MBF, Moscow, Russia*

18:35-18:50

**FEATERS OF ELECTRON PLASMA WAVES AT ABOVE-THRESHOLD IONIZATION OF GAS ATOMS**

K.Yu. Vagin<sup>1</sup>, T.V. Mamontova<sup>1,2</sup>, S.A. Uryupin<sup>1,2</sup>

<sup>1</sup>*P.N. Lebedev Physical Institute of RAS, Moscow, Russia,*

<sup>2</sup>*National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moscow, Russia*

18:50-19:15

**ASYMPTOTIC THEORY OF THE PONDEROMOTIVE DYNAMICS OF AN ELECTRON DRIVEN BY A RELATIVISTICALLY INTENSE FOCUSED ELECTROMAGNETIC ENVELOPE**

O.B. Shiryaev<sup>1,2</sup>

<sup>1</sup>*Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia,*

<sup>2</sup>*Medicobiologic Faculty, N.I. Pirogov Russian National Medical Research University*

***March 27 Continuation of Faenov Memorial Session (NRNU MEPhI)***

**(see Program below Section 4 General Plasmas)**

***SECTION-4 March 27 GENERAL PLASMAS (GPI RAS)***

09:00-09:15

**ON THE ION DRIFT IN COLD GAS**

S.A. Maiorov<sup>1,2</sup>

<sup>1</sup>*Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia*

<sup>2</sup>*Joint Institute for High Temperature of the Russian Academy of Sciences, Moscow, Russia*

09:15-09:30

**CHARACTERISTICS OF THE METAL IONS DRIFT IN HELIUM**

S.A. Maiorov<sup>1,2</sup>, V.S. Kurbanismailov<sup>3</sup>, G.B. Ragimkhanov<sup>3</sup>, Z.R. Khalikova<sup>3</sup>,

<sup>1</sup>*Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia*

<sup>2</sup>*Joint Institute for High Temperature of the Russian Academy of Sciences, Moscow, Russia*

<sup>3</sup>*Dagestan State University, Makhachkala, Russia*

9:30-9:45

**NONLINEAR DISTORTIONS OF THE SIGNAL RADIATED BY PLASMA ASYMMETRIC DIPOLE ANTENNA**

N.N. Bogachev<sup>1,2,3</sup>, N.G. Gusein-zade<sup>1,2</sup>, I.L. Bogdankevich<sup>1,2</sup>, A.M. Ignatov<sup>1,2</sup>, S.E. Andreev<sup>1,2</sup>

<sup>1</sup>Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia,

<sup>2</sup>Pirogov Russian National Medical University, Moscow, Russia,

<sup>3</sup>MIREA – Russian Technological University, Moscow, Russia

9:45-10:00

**ELECTRON DRIFT IN NEON WITH IRON VAPORS: DRIFT VELOCITY, IONIZATION AND RUNAWAY COEFFICIENT**

G. B. Ragimkhanov<sup>1</sup>, V.S. Kurbanismailov<sup>1</sup>, Z.R. Khalikova<sup>1</sup>, S.A. Maiorov<sup>2,3</sup>, K.M. Turekhanova<sup>4</sup>

<sup>1</sup>Dagestan State University, Makhachkala, Russia

<sup>2</sup>Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

<sup>3</sup>Joint Institute for High Temperature of the Russian Academy of Sciences, Moscow, Russia

<sup>4</sup>IETP, Al-Farabi Kazakh National University, Almaty, Kazakhstan

10:00-10:30

**JEANS INSTABILITY AND THE SYMMETRIC GRAVITATIONALLY REPULSIVE MATTER - ANTIMATTER COSMOLOGIES (*Invited*)**

S. A. Trigger

Joint Institute for High Temperatures, RAS, 125412 Moscow, Russia

10:30-10:45

**HIGH ENERGY BALL LIGHTNING**

V.L. Bychkov

Moscow State University, Moscow Russia

**10:45-11:15 Coffee Break**

11:15-11:45

**KRAMERS-KRONIG RELATIONS FOR THE DIELECTRIC PERMITTIVITY OF THE COULOMB SYSTEM WITH A SINGLE-PARTICLE BOSE-EINSTEIN CONDENSATE (*Invited*)**

V.B. Bobrov and S. A. Trigger

Joint Institute for High Temperatures, RAS, 125412 Moscow, Russia

11:45-12:15

**ANEUTRONIC SYNTHESIS OF PROTON – BORON IN A COMPACT SCHEME OF INERTIAL ELECTROSTATIC CONFINEMENT (IEC). (*Invited*)**

Yu.K. Kurilenkov

Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia

12:15-12:30

**FORMATION OF IMPULSE DISCHARGE IN HELIUM OF HIGH PRESSURE**

V.S. Kurbanismailov<sup>1</sup>, S.A. Maiorov<sup>2,3</sup>, O.A. Omarov<sup>1</sup>, G. B. Ragimkhanov<sup>1</sup>

<sup>1</sup>Dagestan State University, Makhachkala, Russia

<sup>2</sup>Prokhorov General Physics Institute of the Russian Academy of Sciences

<sup>3</sup>Joint Institute for High Temperature of the Russian Academy of Sciences, Moscow, Russia

12:30-12:45

**EXTENDED SPACE MODEL APPROACH TO THE GAUGE THEORIES FOR MASSIVE FIELDS**

V.A. Andreev<sup>1</sup>, D.Yu. Tsipenyuk<sup>2</sup>

<sup>1</sup>Lebedev Physical Institute of the Russian Academy Sciences, Moscow, Russia,

<sup>2</sup>Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

**12:45 Closing Remarks**



***International Workshop «Advances in X-ray Diagnostics for Plasma Physics and High Energy Density Science» (NRNU MEPhI)***

**&**

***International Workshop «Complex Systems of Charged Particles and Their Interactions with Electromagnetic Radiation» (GPI RAS)***

***March 27 Continuation of Faenov Memorial Session  
(NRNU MEPhI, Kashirskoe Hwy 31, main building)***

**9.00-9.30 Registration and welcome coffee**

**9:30-10:00 Opening remarks**

**CONTRIBUTION OF PROF. ANATOLY FAENOV TO HIGH ENERGY DENSITY SCIENCE (*Invited*)**

V.E. Fortov  
JIHT RAS

10:00-10:25

**IMAGING X-RAY SPECTROSCOPY OF Z- AND X-PINCHES (*Invited*)**

S.A. Pikuz  
P.N. Lebedev Physical Institute RAS

10:25-10:50

**DATABASE SPECTR-W3 ON SPECTROSCOPIC PROPERTIES OF ATOMS AND IONS (*Invited*)**

I.Yu. Skobelev  
*JIHT RAS / NRNU MEPhI*

10:50-11:15

**MAXIMUM ENERGY DENSITY AND SPATIAL-TIME CORRELATIONS IN ELECTROMAGNETIC PULSE COLLAPSED IN VACUUM (*Invited*)**

A.V. Vinogradov  
*P.N. Lebedev Physical Institute RAS*

**11:15-11:40 Coffee Break**

11:40-12:05

**X-RAY DIAGNOSTICS IN HEDP WITH HIGH POWER LASERS (*Invited*)**

S.A. Pikuz  
*JIHT RAS/ NRNU MEPhI*

12:05-12:30

**X-RAY EMISSION FROM HOLLOW IONS AND DIELECTRONIC SATELLITES (*Invited*)**

F.B. Rosmej  
*UPMC Sorbonne University*

12:30-12:55

**TRACKING HOT ELECTRONS IN MATTER BY SPHERICAL CRYSTAL IMAGER (*Invited*)**

D.D. Batani  
*CELIA, Université Bordeaux*

12:55-13:20

**DISCOVERY OF BURST INTENSIFICATION BY SINGULARITY EMITTING RADIATION (BISER) (*Invited*)**

A.S. Pirozhkov  
*QST KPSI*

**13.20-14.30 Lunch**

14:30-14:55

**THE ROLE OF PRE-PLASMA IN RELATIVISTIC LASER-PLASMA INTERACTION (*Invited*)**

A.B. Savel'ev-Trofimov

*ILC MSU*

14:55-15:20

**SELECTED ISSUES OF CLUSTER PLASMA (*Invited*)**

V.Yu. Bychenkov

*P.N. Lebedev Physical Institute RAS*

15:20-15:45

**MATHEMATICAL MODELING OF THE CLUSTER TARGETS FOR FEMTOSECOND LASER-CLUSTER-DRIVEN EXPERIMENTS (*Invited*)**

A.S. Boldarev

*Kedysh IAM RAS*

15:45-16:10

**ON OBSERVATION OF X-RAY LINE POLARIZATION IN EMISSION FROM HOT LASER-PRODUCED PLASMA (*Invited*)**

A.I. Magunov

*GPI RAS/ VNIIFTRI*

16:10-16:35

**RESULTS OF MAGNETOACTIVE PLASMA STUDIES (*Invited*)**

V.S. Belyaev

*TsNIIMash*

**16:35-17:00 Coffee break**

17:00-17:50

**DIAGNOSTICS IN HIGH ENERGY DENSITY EXPERIMENTS WITH FAST ION BEAMS (*Invited*)**

A.A. Golubev

*NRC KI ITEP*

17:25-17:50

**ANATOLY FAENOV AND TRINITY (*Invited*)**

V.V. Gavrilov

*SSC RF TRINITY*

17:50-18:15

**COHERENT X-RAY MIRAGE: DISCOVERY, THEORY AND POSSIBLE APPLICATIONS. (*Invited*)**

S.A. Magnitskii

*ILC MSU*

18:15-18:40

**ELEMENTARY PROCESSES IN ATOMS AND IONS IN THE FIELD OF X-RAY FREE ELECTRON LASERS (*Invited*)**

A.N. Grum-Grzhimailo

*SINP MSU*

18:40-19:05

**ATOMISTIC MODELING OF RELAXATION IN TWO-TEMPERATURE MEDIA CREATED BY ULTRASHORT LASER PULSES(*Invited*)**

V.V. Stegailov

*JIHT RAS*

19:05-19:20

**PROF. ANATOLY FAENOV - RESEARCH NETWORK AND INTERNATIONAL COLLABORATION(*Invited*)**

T.A. Pikuz

*JIHT RAS/ IOTRI Osaka University*

**19.30-22.00 Friends dinner**

**17th International Workshop  
Complex Systems of Charged Particles and  
Their Interactions with Electromagnetic Radiation**

**Book of Abstracts**