

Institute of Continuous Media Mechanics  
Ural Branch of Russian Academy of Sciences

## Programme

Russian Conference on Magnetohydrodynamics

June 18 – 21, 2018, Perm, Russia

Perm, 2018

Monday, 18 June		Tuesday, 19 June		Wednesday, 20 June		Thursday, 21 June	
8.30	Registration						
9.00	Opening	9.00	Sokoloff D.	9.00	Frick P.	9.00	Krivilyov M.
9.20	Zubarev A.	9.30	Starchenko S.	9.30	Shishkina O.	9.30	Weber N.
9.50	Giesecke A.	9.50	Yushkov E.	9.50	Listratov Y.	9.50	Räbiger D.
10.10	Zikanov O.	10.10	Budaev V.	10.10	Demin V.	10.10	Krauter N.
10.30	Brestensky J.	10.30	Banerjee S.	10.30	Beznosov A.	10.30	Obukhov D.
10.50	Coffee break	10.50	Coffee break	10.50	Coffee break	10.50	Coffee break
11.20	Eckert S.	11.20	Krasnov D.	11.20	Raikher Yu.	11.20	Yokoi N.
11.50	Stepanov R.	11.50	Ivanov A.S.	11.50	Vaganov M.	11.50	Golbraikh E.
12.10	Stefani F.	12.10	Khokhryakova C.	12.10	Kantorovich S.	12.10	Stepanov R.
12.30	Reshetnyak M.	12.30	Dobroserdova A.	12.30	Balasoit M.	12.30	Verma M.
12.50	Aleman A.	12.50	Kuznetsov A.	12.50	Nadzharayan T.	12.50	Yavorsky N.
<b>Lunch 13.10-14.10</b>		<b>Lunch 13.10-14.10</b>		<b>Lunch 13.10-14.10</b>		<b>Lunch 13.10-14.10</b>	
14.10	Likhachev A.	14.10	Ryashchikov D.	14.10	Krylov A.	14.10	Andrievsky A.
14.30	Smirnova K.	14.30	Zavershinskii D.	14.30	Belyaev I.	14.30	Titov V.
14.50	Mindubaev M.	14.50	Vodinchar G.	14.50	Zhang X.	14.50	Chertovskikh R.
15.10	Izmodenov V.	15.10	Triaskin J.	15.10	Kolesnichenko I.	15.10	Smirnov A.
15.30	Mikhailov E.	15.30	Kalinin A.	15.30	Khlybov O.	15.30	Khatbrakhmanov S.
15.50	Coffee break	15.50	Coffee break	15.50	Coffee break	15.50	Coffee break
16.20	Yachikov I.	16.20	Shafarevich A.	16.20	Tselishev V.	16.20	Wertgeim I.
16.40	Karasev T.	16.40	Allilueva A.	16.40	Mandrykin S.	16.40	Sukhanovskii A.
17.00	Proskurin V.	17.00	Belov S.	17.00	Teplyakov I.	17.00	Pavlinov A.
17.20	Bolotin K.			17.20	Losev G.	17.20	Chudnovsky A.
17.40	Dolgikh V.			17.40	Vinogradov D.	17.40	Frizen V.
18.00	Welcome party	<b>Posters 17.20-18.20</b>		<b>Conference dinner</b>		<b>Closing</b>	
				18.00		18.00	

# Conference Program

Monday, 18 June

*Chairman: Sokoloff D.*

9.00 **Opening**

9.20 **Zubarev A.** Zubarev A.Yu., Lopez-Lopez M.T. Internal structures and rheological properties of biological ferrogels

## Session: 1

9.50 **Giesecke A.** Giesecke A., Vogt T., Gundrum T., Stefani F. The precession dynamo experiment at HZDR

10.10 **Zikanov O.** Zikanov O., Xiang L. Modeling of rolling pad instability in liquid metal battery

10.30 **Brestensky J.** Brestensky J., Filippi E., Soltis T. MHD and natural dynamos; magnetoconvection with anisotropic diffusion

10.50 **Coffee break**

*Chairman: Zikanov O.*

11.20 **Eckert S.** Eckert S. Application of electromagnetic fields in material processing, metallurgy, casting and crystal growth

## Session: 2

### Astrophysical and Geophysical Magnetohydrodynamics

11.50 **Stepanov R.** Stepanov R., Kuzanyan K. Wavelet analysis of magnetic energy and current helicity in the solar photosphere using vector magnetographic observations

12.10 **Stefani F.** Stefani F., Giesecke A., Weber N., Weier T. A tidally synchronized Tayler-Spruit type model of the solar dynamo

12.30 **Reshetnyak M.** Reshetnyak M.Yu. Growth of the inner core and magnetic field generation

12.50 **Alemanly A.** Alemany A., Francois M., Jeantet Ph., Poli G., Zeminiani E., Eckert S., Freibergs J., Brekis A. SpaceTRIPS

**Lunch 13.10-14.10**

Monday, 18 June

## Session: 3A

### Astrophysical and Geophysical Magnetohydrodynamics

*Chairman: Stepanov R.*

- 14.10 **Likhachev A.** Gubanov E.V., Likhachev A.P., Medin S.A. Quasi-periodic reconnection in the Earth's geomagnetic tail: simulation in 2D resistive MHD model
- 14.30 **Smirnova K.** Smirnova K., Mikhailov E., Sokoloff D. Magnetic fields of the outer galaxy rings that are perpendicular to the equatorial plane
- 14.50 **Mindubaev M.** Khachay Yu., Mindubaev M. A numerical scheme for modeling the formation of the MHD process in a growing Earth
- 15.10 **Izmodenov V.** Izmodenov V.V. Kinetic-MHD modeling of the stellar/solar wind interaction with the local interstellar medium (LISM): effects of stellar and interstellar magnetic fields
- 15.30 **Mikhailov E.** Mikhailov E.A., Sibgatullin I.N. Turbulent motions in the outer rings of galaxies connected with the magnetic fields
- 15.50 **Coffee break**

## Session: 4A

### Applied Magnetohydrodynamics

*Chairman: Eckert S.*

- 16.20 **Yachikov I.** Yachikov I.M., Portnova I.V., Karandaev A.S. Behavior of the current-carrying melt exposed to the action of external vertical magnetic field in a direct current arc furnace bath
- 16.40 **Karasev T.** Karasev T., Nikulin I., Perminov A. Numerical modeling of flows and surface stresses in melt-oxide scab system during induction heating
- 17.00 **Proskurin V.** Proskurin V.A., Sagalakov M.A. A MHD flow in 90-degree bent channel
- 17.20 **Bolotin K.** Bolotin K., Shvydkiy E., Sokolov I., Sarapulov S. Experimental verification of numerical simulation of adapted MHD stirrer
- 17.40 **Dolgikh V.** Dolgikh V., Pavlinov A. Investigation of the MHD-pump model with inclined partitions in the channel
- 18.00 **Welcome party**

Monday, 18 June

## Session: 3B

### Magnetic Fluids and Their Applications

*Chairman: Kantorovich S.*

- 14.10 **Ivanov A.O.** Ivanov A.O., Elfimova E.A. Static magnetization of an ensemble of interacting superparamagnetic nanoparticles
- 14.30 **Solovyova A.** Solovyova A.Yu., Elfimova E.A. The initial magnetic susceptibility of polydisperse ferrofluids: new universal approach
- 14.50 **Petrov D.** Petrov D.A., Mantsurov A.V., Zakhlevnykh A.N. Statistical theory of magnetic field behavior of liquid crystals doped with carbon nanotubes
- 15.10 **Zverev V.** Zverev V.S., Elfimova E.A., Ivanov A.O. Influence of dipole-dipole interactions on the characteristic times of Brownian magnetic nanoparticles response to the arbitrary time-varying field
- 15.30 **Makarov D.** Makarov D.V., Novikov A.A., Zakhlevnykh A.N. Chiral magnetic liquid crystalline suspension in a rotating magnetic field
- 15.50 **Coffee break**

## Session: 4B

### Soft Magnetic Matter and its Application-Oriented Aspects

*Chairman: Elfimova E.*

- 16.20 **Sanchez P.** Sanchez P.A., Stolbov O.V., Raikher Y.L., Kantorovich S.S. Theoretical modeling of hybrid magnetic elastomers
- 16.40 **Minina E.** Minina E.S., Sanchez P.A., Kantorovich S.S., Kramarenko E.Yu. Mechanical properties of magneto-elastic coatings
- 17.00 **Ryzhkov A.** Ryzhkov A.V., Raikher Yu.L. Simulation of the response of magnetic polymersome in external magnetic field
- 17.20 **Musikhin A.** Zubarev A.Yu., Musikhin A.Yu. Shear modulus of isotropic ferrogels
- 17.40 **Merkulov D.** Merkulov D.I., Pelevina D.A., Naletova V.A., Turkov V.A. Experimental research of the multistability of bodies with a magnetizable elastomer
- 18.00 **Welcome party**

Tuesday, 19 June

*Chairman: Stefani F.*

- 9.00 **Sokoloff D.** Sokoloff D., Katsova M., Kitchatinov L., Moss D., Usoskin I.  
Can superflares occur on the Sun?

## Session: 5

### Fundamental Problems of Magnetohydrodynamics

- 9.30 **Starchenko S.** Starchenko S.V. Critical and ordinary hydrodynamic and magnetism of planetary interiors
- 9.50 **Yushkov E.** Yushkov E., Lukin A., Sokoloff D. Large-scale and small-scale processes in Kazantsev dynamo model.
- 10.10 **Budaev V.** Budaev V.P., Fedorovich S.D., Lukashovsky M.V., Martynenko Yu.V., Gubkin M.K., Karpov A.V., Lazukin A.V., Shestakov E.A. Plasma magnetic trap of linear multi-cusp configuration — the component of a plasma propulsion rocket engine
- 10.30 **Banerjee S.** Banerjee S., Kritsuk A.G. Energy transfer in compressible MHD turbulence for isothermal self-gravitating fluids

10.50 **Coffee break**

*Chairman: Pshenichnikov A.*

- 11.20 **Krasnov D.** Krasnov D.S., Belyaev I.A., Biryukov D.A., Listratov Y.I., Sviridov V.G. Instabilities in mixed convection at moderate and strong magnetic fields

## Session: 6

### Magnetic Fluids and Their Applications

- 11.50 **Ivanov A.S.** Ivanov A.S. Magnetostatic energy of a ferrofluid drop in experimental studies
- 12.10 **Khokhryakova C.** Khokhryakova C.A., Kostarev K.G., Paravina D.K. Surface waves in two-layered system induced by the magnetic field
- 12.30 **Dobroserdova A.** Dobroserdova A.B., Sanchez P.A., Kantorovich S.S. The study of magnetoactive elastomers using the FORC method
- 12.50 **Kuznetsov A.** Kuznetsov A.A. Equilibrium magnetization of a quasi-spherical cluster of single-domain particles

**Lunch 13.10-14.10**

Tuesday, 19 June

**Session: 7A**

**Fundamental Problems of Magnetohydrodynamics**

*Chairman: Verma M.*

- 14.10 **Ryashchikov D.** Ryashchikov D.S., Molevich N.E., Zavershinskii D.I. Two-dimensional MHD wave patterns in thermally unstable plasma
- 14.30 **Zavershinskii D.** Pichugin S.Yu., Ryashchikov D.S., Molevich N.E., Zavershinskii D.I. Condensation mode instability in partially ionized heat-releasing plasma
- 14.50 **Vodinchar G.** Vodinchar G.M., Kazakov E.A. Some generalizations of the Lorentz system as dynamo models
- 15.10 **Triaskin J.** Pavlov V.A., Triaskin J.V. Influence of shock wave on a weakly ionized gas
- 15.30 **Kalinin A.** Kalinin A., Sokoloff D. Dynamo resonances in a simple dynamo model
- 15.50 **Coffee break**

**Session: 8A**

**Fundamental Problems of Magnetohydrodynamics**

*Chairman: Golbraikh E.*

- 16.20 **Shafarevich A.** Shafarevich A. Asymptotics of magnetic field in a well conducting fluid on a 2D surface of revolution
- 16.40 **Allilueva A.** Allilueva A. Evolution of small localized perturbations in a well conducting fluid
- 17.00 **Belov S.** Belov S.A., Molevich N.E., Zavershinskii D.I. Alfvén waves amplification due to parametric interaction with magnetoacoustic waves in isentropically unstable fully-ionized plasma

**Posters 17.20-18.20**

Tuesday, 19 June

## Session: 7B

### Magnetic Fluids and Their Applications

*Chairman: Ivanov A.S.*

- 14.10 **Kramarenko Yu.** Kramarenko Yu.E., Paramonov E.I., Zverev V.S., Elfimova E.A. Influence of dipolar interactions on the magnetic susceptibility spectra of the ferrofluids
- 14.30 **Lebedev A.** Lebedev A.V. Paradoxical increasing of magnetic fluid susceptibility in strong fields
- 14.50 **Korovin V.** Kazhan V.A., Korovin V.M. Influence of strong longitudinal uniform magnetic field on capillary instability of a cylindrical jet of magnetic fluid
- 15.10 **Radionov A.** Radionov A.V., Podoltsev A.D. The specific features of high-velocity magnetic fluid sealing complexes
- 15.30 **Burkova E.** Burkova E., Pshenichnikov A. Simulation of permanent magnet levitation in the magnetic fluid
- 15.50 **Coffee break**

## Session: 8B

### Heat and Mass Transfer in Liquid Metals

*Chairman: Shishkina O.*

- 16.20 **Kotlyar A.** Kotlyar A.V., Listratov Y.I., Sviridov V.G. Hydrodynamics and heat transfer of molten salts in the fusion reactor TOKAMAK
- 16.40 **Zhang X.** Zhang X., Shishkina O. Heat transfer in rotating Rayleigh–Bénard convection in pressured SF<sub>6</sub>
- 17.00 **Teimurazov A.** Teimurazov A., Frick P., Weber N., Stefani F. Numerical simulations of liquid magnesium and magnesium salt convection in the titanium reduction reactor

**Posters 17.20-18.20**

# Posters

Tuesday, 19 June

*Chairman: Sokoloff D.*

- 1 **Allilueva A.** Allilueva A. Localized asymptotic solutions of the linerized MHD equations
- 2 **Shibalova A.** Shibalova A., Obridko V., Sokoloff D. Intermittency of solar magnetic field and solar magnetic activity cycle
- 3 **Starchenko S.** Starchenko S.V., Yakovleva S.V. Geodynamo estimations based on origin, evolution and probabilistic time analysis of Gauss multipoles
- 4 **Lukin A.** Lukin A., Yushkov E., Sokoloff D. Subcritical regimes of Kazantsev dynamo-model
- 5 **Gupta A.** Gupta A., Ganesh R. Study of rotational shear waves in viscoelastic fluids
- 6 **Naresh K.** Rani H.P., Naresh K., Rameshwar Y. Stability analysis of Ekman boundary layer for the flow between parallel plates
- 7 **Kochurin E.** Kochurin E.A., Zubarev N.M. Wave breaking on the free surface of a liquid dielectric in tangential electric field: weakly and strongly nonlinear models
- 8 **Pipin V.** Pipin V. Stochastic excitation of large-scale nonaxisymmetric field in solar type dynamo
- 9 **Smolyanov I.** Smolyanov I., Tarasov F., Sarapulov F. Research of shape duct of induction pump for purpose of pumping out liquid magnesium
- 10 **Musaeva D.** Musaeva D., Baake E., Ilin V. Melt solidification during electromagnetic stirring: experimental investigation of a solid/liquid interface formation
- 11 **Losev G.** Losev G., Philimonov A., Pavlinov A., Kolesnichenko I. Vortex flow of liquid metal under the influence of modulated magnetic field
- 12 **Bryukhanova E.** Nikulin I., Perminov A., Bryukhanova E. Modeling of averaged metal flows in an alternating magnetic field with a radiation heatsink from a free surface
- 13 **Khripchenko S.** Khripchenko S., Siraev R., Denisov S., Dolgikh V., Kolesnichenko I. Effect of MHD stirrer placement relative to crucible bottom on a liquid metal flow
- 14 **Stepanov A.** Stepanov A., Pavlinov A., Kolesnichenko I., Dolgikh V. Conductive electromagnetic pump with partitions located perpendicular to the flow in the channel
- 15 **Filimonov A.** Filimonov A., Pavlinov A., Kolesnichenko I., Shvydkiy E., Khalilov R. Influence of modulated and steadily applied travelling magnetic field on liquid metal stirring
- 16 **Zibold A.** Zibold A.F. Peculiarity of Taylor's and wavy vortices initiation in the instability study of the conducting liquid flow, generated by a rotating magnetic field
- 17 **Makarov D.** Makarov D.V., Zakhlevnykh A.N., Khairtdinov D.F. Magnetic behavior of a nematic liquid crystal doped with spiral magnetic particles

- 18 **Petrov D.** Skokov P.K., Petrov D.A., Zakhlevnykh A.N. Magneto-orientational response of liquid crystal suspensions of magnetically doped carbon nanotubes
- 19 **Kripachev A.** Storozhenko A., Stannarius R., Eremin A., Shabanova I., Kripachev A. Influence of viscosity on the behavior of suspensions containing magnetic nanoparticles in rotating magnetic field
- 20 **Novikov A.A.** Novikov A.A., Zakhlevnykh A.N. Helix unwinding in chiral liquid crystals doped with magnetic particles
- 21 **Ambarov A.** Ambarov A.V., Zverev V.S., Elfimova E.A. The effects of interparticle dipole-dipole interactions on the magnetic susceptibility spectra of superparamagnetic particles
- 22 **Kolesnichenko E.** Kolesnichenko E.V., Kolchanov N.V. Dependence of magnetic fluid viscosity on concentration of solid particles and temperature
- 23 **Rozhkov D.** Novak E., Rozhkov D., Pyanzina E., Kashpurova M., Sanchez P.A., Kantorovich S.S. Self-assembly of bidisperse supracolloidal magnetic polymers
- 24 **Subbotin I.** Subbotin I.M. Mathematical modelling of an inverse ferrofluid emulsion: case of nonlinear ferrofluid magnetization
- 25 **Abu-Bakr A.** Abu-Bakr A.F., Zubarev A.Yu. The influence of rotation magnetic field on interparticle interaction particles in magnetic hyperthermia
- 26 **Pavlinov A.** Kolesnichenko I., Pavlinov A., Khalilov R., Mamykin A., Frick P. Creation of homogeneous boundary conditions for experimental studies of sodium convection
- 27 **Mandrykin S.** Mandrykin S., Teimurazov A. Numerical study of turbulent liquid metal convection in inclined cylinder of unit aspect ratio using large-eddy-simulation approach
- 28 **Karasev T.** Karasev T., Teimurazov A. Numerical simulations of liquid magnesium turbulent convection using OpenFOAM code with the RANS approach
- 29 **Belyaev I.** Belyaev I., Chernysh D., Luchinkin N., Razuvanov N. Influence of channel inclination on heat transfer of liquid metal flow
- 30 **Muite B.** Muite B.K. A Fourier pseudospectral code for solving the magnetohydrodynamic equations with internal heating
- 31 **Khalilov R.** Khalilov R., Kolesnichenko I., Mamykin A., Teimurazov A. Convection of Liquid sodium in a vertical cylindrical channel subject to nonuniform heating from above
- 32 **Sorokin A.** Sorokin A.P., Kuzina Yu.A. Hydrodynamics and heat transfer in pin bundles with sodium coolant
- 33 **Listratov Y.** Ahmedagaev R., Listratov Y. Mixed convection in horizontal pipe flow with a longitudinal magnetic field
- 34 **Kostychev P.** Kostychev P.V., Razuvanov N.G., Sviridov V.G. Study of vertical liquid metal flow hydrodynamics and heat exchange along a rectangular section channel in a coplanar magnetic field
- 35 **Pyatnitskaya N.** Pyatnitskaya N.Yu., Sviridov E.V., Razuvanov N.G., Melnikov I.A. Influence of the coplanar magnetic field on the liquid metal flow in a rectangular vertical channel under the influence of thermal load
- 36 **Novikov A.O.** Novikov A.O., Sviridov V.G. Thermogravitation convection influence on heat transfer in the channel modeling the active zone of the brest nuclear reactor

Wednesday, 20 June

*Chairman: Sviridov V.*

9.00 **Frick P.** Frick P., Sviridov V. Turbulent convective heat transfer in liquid metals

## Session: 9

### Heat and Mass Transfer in Liquid Metals

9.30 **Shishkina O.** Shishkina O., Zwirner L. Confined inclined thermal convection in low-Prandtl-number fluids

9.50 **Listratov Y.** Tyalina N., Listratov Y. Numerical investigation of MHD heat transfer in a liquid metal upward duct flow with a coplanar magnetic field

10.10 **Demin V.** Demin V.A., Mizev A.I., Petukhov M.I., Smyrov A.V. On longitudinal separation of a binary metal melt in an inclined thin capillary

10.30 **Beznosov A.** Beznosov A.V., Bokova T.A., Bokov P.A., Pinaev S.S. Experimental investigations of magnetic-hydrodynamic resistance of flow of the lead-bismuth coolant in the transverse magnetic field

10.50 **Coffee break**

*Chairman: Ivanov A.O.*

11.20 **Raikher Yu.** Raikher Yu.L., Stepanov V.I. Dynamic magneto-optical effect caused by particle-matrix coupling in ferronematics

## Session: 10

### Soft Magnetic Matter and its Application-Oriented Aspects

11.50 **Vaganov M.** Vaganov M.V., Raikher Yu.L. Model of a magnetic elastomer with embedded multigrain magnetic particles

12.10 **Kantorovich S.** Kantorovich S.S. Self-propelled magnetic filaments

12.30 **Balasoiu M.** Balasoiu M., Bunoiu M., Kuklin A., Soloviov D., Bica I., Raikher Yu. Small-angle neutron scattering characterization of a magnetorheological elastomer with carbonyl iron microspheres

12.50 **Nadzharyan T.** Nadzharyan T.A., Kostrov S.A., Stepanov G.V., Kramarenko E.Yu. Comparative analysis of fractional rheological models for the purposes of describing the mechanical response of magnetoactive elastomers in magnetic fields

**Lunch 13.10-14.10**

Wednesday, 20 June

## Session: 11A

### Heat and Mass Transfer in Liquid Metals

*Chairman: Listratov Ya.*

- 14.10 **Krylov A.** Krylov A.N., Rogozkin S.A., Fadeev I.D. Computational and experimental studies on the mixing process of sodium coolant flows with different temperatures downstream of a baffle in a channel
- 14.30 **Belyaev I.** Belyaev I., Biryukov D., Razuvanov N., Sviridov V. Experimental investigation of liquid metal mixed convection affected by transverse magnetic field
- 14.50 **Zhang X.** Zhang X., Zikanov O. Magnetoconvection in a vertical duct with downward flow and strong transverse magnetic field
- 15.10 **Kolesnichenko I.** Kolesnichenko I., Frick P., Khalilov R., Mamykin A., Pavlinov A., Shestakov A. Liquid sodium convection in an inclined cylinder of unit aspect ratio
- 15.30 **Khlybov O.** Khlybov O.A., Lyubimova T.P. Effect of traveling magnetic field on mass transfer and dopant segregation during directional solidification of semiconductors
- 15.50 **Coffee break**

## Session: 12A

### Fundamental Problems of Magnetohydrodynamics

*Chairman: Yukoi N.*

- 16.20 **Tselishev V.** Tselishev V.Y., Smorodin B.L. The charge distribution in a flat capacitor in the presence of the diffusion and anonymous unipolar injection
- 16.40 **Mandrykin S.** Mandrykin S., Kolesnichenko I., Losev G., Frick P. Experimental study of the electrovortex flow generated by opposing point electrodes in a vertical cylindrical cell
- 17.00 **Teplyakov I.** Teplyakov I.O., Vinogradov D.A., Ivochkin Yu.P. Investigation of the Rossby vortices in the electrovortex flow in hemispherical geometry
- 17.20 **Losev G.** Losev G., Khalilov R., Kolesnichenko I. Energy and spectral characteristics of MHD vortex flow
- 17.40 **Vinogradov D.** Teplyakov I.O., Vinogradov D.A., Ivochkin Yu.P. A study of the applicability of the electrodynamic approximation in the simulation of the electrovortex flow with the presence of an external magnetic field
- 18.00 **Conference dinner**

Wednesday, 20 June

## Session: 11B

### Magnetic Fluids and Their Applications

*Chairman: Zubarev A.*

- 14.10 **Khokhryakova C.** Pshenichnikov A.F., Khokhryakova C.A., Lebedev A.V., Gilev V.G. The force acting on a nonmagnetic body in a magnetic fluid
- 14.30 **Vtulkina E.** Vtulkina E.D., Elfimova E.A. Thermodynamics and phase separation in bidisperse dipolar hard spheres
- 14.50 **Ryapolov P.** Polunin V.M., Ryapolov P.A., Ryabtsev K.S., Shabanova I.A., Sokolov E.A. Air cavity constrained by magnetic fluid in ‘magnetic vacuum’ of an annular magnet
- 15.10 **Krauzina M.** Bozhko A.A., Krauzina M.T., Sidorov A.S., Suslov S.A. Features of ferrocolloid convection in gravitational and magnetic fields
- 15.30 **Krauzin P.** Krauzin P.V., Zakhlevnykh A.N. Magnetic field induced biaxial order in nematic liquid crystals doped with magnetic nanoparticles
- 15.50 **Coffee break**

## Session: 12B

### Applied Magnetohydrodynamics

*Chairman: Obukhov D.*

- 16.20 **Shvydkiy E.** Shvydkiy E., Bolotin K., Byschkov S., Zaharov V. 3D simulation of particles transport in double side travelling magnetic field stirrer
- 16.40 **Kwak J.** Kwak J., Kim H.R. Optimization of outer core for end effect reduction of annular linear MHD pump
- 17.00 **Fomin A.** Fomin A.V., Guliashinov A.A. Electromagnetic stirring of the liquid core of crystallizing ingot
- 17.20 **Chudnovsky A.** Chudnovsky A.Yu., Malinovsky V.S. 3D-stirring of melts in electrical arc furnaces
- 17.40 **Frizen V.** Frizen V., Shvydkiy E., Kamaev D. Electromagnetic stirrer of molten metal with dual-frequency supply
- 18.00 **Conference dinner**

Thursday, 21 June

*Chairman: Gieseke A.*

- 9.00 **Krivilyov M.** Krivilyov M. Control of electromagnetically induced flow and its effect on microstructure formation in the space experiment PERITEKTICA (PARSEC) onboard of the ISS

## Session: 13

### Applied Magnetohydrodynamics

- 9.30 **Weber N.** Weber N., Ashour R., Herreman W., Horstmann G.M., Kelley D., Landgraf S., Nore C., Personnetaz P., Stefani F., Weier T. MHD of liquid metal batteries
- 9.50 **Räbiger D.** Räbiger D., Willers B., Eckert S. Flow structure optimization and the impact on the solidification structure
- 10.10 **Krauter N.** Krauter N., Stefani F. Immersed transient eddy current flow metering: a calibration-free velocity measurement technique for liquid metals
- 10.30 **Obukhov D.** I.V. Vitkovsky, M.M. Golovanov, I.R. Kirillov, K.A. Komov, S.A. Krizanovsky, D.M. Obukhov, G.V. Preslitsky, V.S. Federyaeva, V.T. Berikbosinov, D.V. Gusev, S.V. Ruhlin, V.S. Shorkin, S.N. Romashin New requirements and approaches in development of electromagnetic pumps for liquid metal fast breeder reactors

10.50 **Coffee break**

*Chairman: Frick P.*

- 11.20 **Yokoi N.** Yokoi N. Multi-scale analysis of turbulent transport in strongly compressive magnetohydrodynamic flow

## Session: 14

### Magnetohydrodynamic turbulence

- 11.50 **Golbraikh E.** Golbraikh E. On the turbulence of flows in the constant magnetic fields with small Stuart number
- 12.10 **Stepanov R.** Stepanov R., Titov V., Plunian F., Verma M. Magnetic energy and helicity mode-to-mode transfers in a dynamo action
- 12.30 **Verma M.** Verma M. Energy transfers in magnetohydrodynamics: perspectives from DNS and shell model
- 12.50 **Yavorsky N.** Yavorsky N.I. New exact solutions of MHD equations for the flow between two infinite discs. Spontaneous rotation

**Lunch 13.10-14.10**

Thursday, 21 June

## Session: 15A

### Fundamental Problems of Magnetohydrodynamics

*Chairman: Brestensky J.*

- 14.10 **Andrievsky A.** Andrievsky A.A., Zheligovsky V.A., Chertovskih R.A. Negative magnetic eddy diffusivity caused by the oscillatory alpha-effect
- 14.30 **Titov V.** Titov V., Stepanov R. Helical effects in forced MHD turbulence
- 14.50 **Chertovskih R.** Chertovskih R.A., Rasskazov A., Zheligovsky V.A. Magnetic field generation by pointwise zero-helicity flows
- 15.10 **Smirnov A.** Smirnov A. Chiral assymetry evolution in the early Universe for the case almost constantly helicity
- 15.30 **Khaibrakhmanov S.** Khaibrakhmanov S.A., Dudorov A.E. Influence of Ohmic and ambipolar heating on thermal structure of accretion disks
- 15.50 **Coffee break**

## Session: 16A

### Magnetohydrodynamic turbulence

*Chairman: Stepanov R.*

- 16.20 **Wertgeim I.** Wertgeim I.I., Zaks M.A. Numerical modeling of dynamics in vortex lattices for plane MHD flows
- 16.40 **Sukhanovskii A.** Sukhanovskii A., Batalov V., Stepanov R., Frick P. Dynamics of a turbulent swirling flow in a toroidal channel
- 17.00 **Pavlinov A.** Pavlinov A., Denisov S., Noskov V., Stepanov R., Frick P. Pulsed flows of liquid sodium in a toroidal channel: grid-induced turbulence
- 17.20 **Chupin A.** Chupin A. Saturated dynamo in a partly helical flow in a channel
- 17.40 **Mizeva I.** Frick P., Mizeva I. MHD turbulence in spin-down flows of liquid metals
- 18.00 **Closing**

Thursday, 21 June

## Session: 15B

### Applied Magnetohydrodynamics

*Chairman: Krivilyov M.*

- 14.10 **Sokolov I.** Sokolov I., Bolotin K., Kravtsov A. Design optimization of MHD stirrer for liquid silicon
- 14.30 **Khripchenko S.** Khripchenko S., Siraev R., Denisov S., Dolgikh V., Kolesnichenko I. The flow of a liquid gallium alloy in a cylindrical crucible under the action of intermittent travelling and rotating magnetic fields
- 14.50 **Mamykin A.** Mamykin A., Losev G., Kolesnichenko I. Impact on impurities in a flat MHD duct
- 15.10 **Nikulin I.** Nikulin I. Analysis of melt surface cleaning possibilities by controlling frequency and spatial distribution of alternating magnetic field
- 15.30 **Khalilov R.** Khalilov R., Krauter N., Stefani F., Frick P., Pavlinov A., Kolesnichenko I., Teimurazov A. Magnesium level detection in a titanium reduction reactor
- 15.50 **Coffee break**

## Session: 16B

### Soft Magnetic Matter and its Application-Oriented Aspects

*Chairman: Raikher Yu.*

- 16.20 **Pyanzina E.** Pyanzina E., Novak E., Rozhkov D., Gudkova A., Sanchez P.A., Ronti M., Kantorovich S.S. Self-assembly in magnetic filament solutions
- 16.40 **Novak E.** Steinbach G., Schreiber M., Nissen D., Albrecht M., Novak E., Sanchez P.A., Kantorovich A., Gemming S., Erbe A. Self-assembly of colloidal particles with a magnetic coating
- 17.00 **Stolbov O.** Stolbov O., Stolbova O., Raikher Yu. Macroscopic model of structure formation in magnetorheological elastomers
- 17.20 **Chirikov D.** Chirikov D.N., Zubarev A.Yu. Shear modulus of magnetic elastomers with anisotropic structures
- 17.40 **Pelevina D.** Pelevina D.A., Naletova V.A., Turkov V.A. Lifting of magnetic and non-magnetic fluids over a magnetizable body in a uniform magnetic field
- 18.00 **Closing**