

International Conference
“Functional Materials”

ICFM-2023

PROGRAM

October 2 – 6, 2023
Russia, Crimea, Foros

International Conference “Functional Materials” ICFM-2023

Program Committee

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ICFM'2023

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Information for participants

LOCATION

The conference will be held in Foros. Accommodation will be available in "Foros Wellness & Park".

CONFERENCE SESSIONS will be held in the conference hall of the "Foros Wellness & Park". Information about possible amendments in the Conference Program will be available through the announcements at the Organizing Committee information desk. For more detailed info please contact the Local Organizing Committee.

PRESENTATIONS

Plenary, Invited 40 minutes (include discussion)
Oral 15 minutes (include discussion)
Poster 0.84x1.20 m (A0)

LANGUAGE

English, Russian

CONFERENCE PROCEEDINGS

Participants are solicited to submit full papers of their accepted contribution to publish in the journal "Physics of Metals and Metallography" (<https://www.springer.com/journal/11508>). Selected reports will be published in the journal (special issue devoted to the ICFM-2023 conference). The Program Committee will execute the preliminary selection of papers.

TRANSPORT

The main net of public transport is available in Simferopol and Sevastopol. You can use a bus or taxi from Simferopol railway station to Foros.

CULTURE PROGRAM

Monday, October 2, at 20.00 Welcome party
Thursday, October 4, at 20.00 Conference Dinner
For additional information about excursions (Crimea is known by its history, landscapes, etc.) please contact the Local Organizing Committee

TIME-TABLE OF THE DINNING-HALL:

8.00-9.00 – breakfast
13.00-14.00 – dinner
18.00-20.00 – supper

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Schedule of Conference

Date	Time	Events	
Monday, October 2	16.00-18.00	Registration.	
	19.30-20.00	Conference opening	
	20.00-22.00	Welcome Party	
Tuesday, October 3 (A Day)	9.00-11.00	Session A1	Plenary Session A1
	11.30-12.30		
	12.30-13.30	Oral Session AO1	Section 2. Ferro and Antiferromagnetic Spintronics and Magnonics
	15.00-16.00	Session A2	Plenary Session A2
	16.00-16.30	Oral Session AO2	Section 2. Ferro and Antiferromagnetic Spintronics and Magnonics
	16.30-18.30	Poster Session AP1	Section 2. Ferro and Antiferromagnetic Spintronics and Magnonics
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Wednesday, October 4 (B Day)	9.00-11.00	Session B1	Plenary Session B1
	11.30-13.00	Oral Session BO1	Section 1. Fundamental Physics of Functional Materials
	15.00-16.00	Oral Session BO2	Section 5. Nanostructured Materials and Composites
	16.00-16.45	Oral Session BO3	Section 9 Materials for Medical and Environmental Applications. Biosensors
	17.30-18.30	Poster Session BP1	Section 1. Fundamental Physics of Functional Materials
Thursday, October 5 (C Day)	9.00-11.00	Session C1	Plenary Session C1
	11.30-11.30		
	12.30-13.30	Oral Session CO1	Section 3. Plasmonics and Nanophotonics
		Oral Session CO2	Section 3. Plasmonics and Nanophotonics
	16.30-17.30	Oral Session CO3	Section 8. Nanostructured Materials and Composites
	17.45-18.45	Poster Session CP1	Section 3. Plasmonics and Nanophotonics
		Poster Session CP2	Section 7. Multiferroics and Magnetoelectric Materials
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Friday, October 6	10.00-11.00	Closing	

Monday, October 2

16:00 – 18:00

Registration

19:30 – 20:00

Conference Opening

Welcome Party

Tuesday, October 3**Day A****09:00 – 11:00****Plenary session****A1****Chairman:** Belotelov V.I.

- A1-L/1 **The van der Waals magnets: new functional materials for magnetic electronics**
Pyatakov A. P.
- A1-L/2 **Introduction to metamaterials with selected examples**
Lapine M.

*Coffee Break***11:30 – 12:30****Plenary session****A1**

- A1-L/3 **From Microelectronics to Spintronics and Magnonics**
Han X.F.

12:30 – 13:30**Oral session****AO1****Section 2: Ferro and Antiferromagnetic Spintronics and Magnonics****Chairman:** Lapine M.

- AO1-2O/1 **Dynamics and transformation of magnetic vortices in a spin-transfer nanooscillator (*Invited*)**
Ekomasov E. G., Zvezdin K. A., Antonov G.I., Filippova V.V.
- AO1-2O/2 **Spin-orbit coupling mediated size effects in magnetoresistance of Ta nanolayers (*Invited*)**
Naumova L.I., Ustinov V.V., Zavornitsyn R.S., Yasyulevich I.A., Maksimova I.K., Krinitsina T.P., Pavlova A.Y., Proglyado V.V., Milyaev M.A.

Lunch

15:00 – 16:00 **Plenary session** **A2**

Chairman: Pyatakov A. P.

A2-1L/1 **Magnetic nanoclusters**
Zvezdin A. K.

16:00 – 16:30 **Oral session** **AO2**

Section 2: Ferro and Antiferromagnetic Spintronics and Magnonics

Chairman: Tikhonov V.V.

AO2-2O/1 **Direct observation of magnon BEC in YIG film at room temperature** (*Invited*)
Bunkov Y.M., Belotelov V.I., Knyazev G.A., Kuzmichev A.N.,
Petrov P.E., Savochkin I.V., Vetoshko P.M.

AO2-2O/2 **Spin-wave diagnostics of ultrathin YIG films**
Tikhonov V.V., Gubanov V.A., Sadovnikov A.V.

AO2-2O/3 **Bound states in the radiation spectrum of Leaky Surface Magnon Polarons**
Sukhorukova O.S., Tarasenko A.S., Tarasenko S.V.,
Shavrov V.G.

16:30 – 18:30 **Poster session** **AP1**

Section 2: Ferro and Antiferromagnetic Spintronics and Magnonics

Chairman: Lyubchanskii I.L.

AP1-2P/1 **Non-reciprocal propagation and coupling of spin waves in an asymmetric magnonic structure**
Grachev A.A., Odintsov S.A., Beginin E.N., Sadovnikov A.V.

AP1-2P/2 **Control of the spectrum of spin waves in a rounded structure with the introduction of local laser heating**
Gubanov V.A., Kruglyak V.V., Sadovnikov A.V.

AP1-2P/3 **Nonreciprocal caustic spin waves in partially metallized T-shape waveguide**
Martyshkin A.A., Lock E.H., Orgin F., Sadovnikov A.V.

AP1-2P/4 **Strain-magneto-optical phenomena in ferrite-spinel crystals**
Telegin A.V., Surzhikov E.A., Sukhorukov Yu.P., Naumov S.V.

- AP1-2P/5 **Nonreciprocal modes of selection of spin waves in the low-frequency and high-frequency ranges in multilayer magnonic crystals**
Odintsov S.A., Ptashenko A.S., Lock E.H., Beginin E.N., Sadovnikov A.V.
- AP1-2P/6 **Effects of the spatial distribution of the spin-wave signal power in a system of orthogonal YIG waveguides**
Masliy R.V., Khutieva A.B., Sadovnikov A.V.
- AP1-2P/7 **Investigation of filtration regimes in the composite structure of ferromagnetic waveguides with varied width**
Garanin F.E., Gubanov V.A., Khutieva A.B., Sadovnikov A.V.
- AP1-2P/8 **Comparative analysis of properties of magneto-optical magnon junctions on the base TmBiIG and YBiIG**
 Semuk E.Yu., Lyashko S.D., Nauhatsky I.A., Osmanov S.V., Mikhailova T.V., Berzhansky V.N., Belotelov V.I., Han X.F.,

16:30 – 18:30

Poster session

AP2

Section 8: Nanostructured Materials and Composites

Chairman: Mikhailova T.V.

- AP2-8P/1 **Effect of unintentionally doping on internal friction and functional properties of gallium oxide single crystals**
 Panov D.Y., Kalganov D.A., Bauman D.A., Romanov A.E.
- AP2-8P/2 **Magnetic and optical properties of epitaxial (YBiCa)₃Fe₅O₁₂ films on paramagnetic substrate in a wide temperature range**
 Kupchinskaya N.E., Polulyakh S.N, Pakhomov A.S., Maksimov F.M., Berzhansky V.N., Belotelov V.I., Chernov A.I.
- AP2-8P/3 **Influence of temperature on the structure of α -Fe₂O₃ thin films**
 Merencova K.A., K.A., Korkh Y.V., Kuznetsova T.V., Nosov A.P., Dubinin S.S.
- AP2-8P/4 **Magneto-optical Ellipsometry of Thin Films with Optical Uniaxial Anisotropy**
 Maximova O.A., Lyaschenko S.A., Varnakov S.N., Yakovlev I.A., Shevtsov D.A., Andryushchenko T.A., Ovchinnikov S.G.
- AP2-8P/5 **Theoretical and experimental study of the two-sublattice iron garnet system with the magnetization compensation point in a two-dimensional magnetic field**

- Prisyazhnyuk A.V., Gusev N.A., Ignatyeva D.O., Polulyakh S.N., Zvezdin A.K., Berzhansky V.N., Belotelov V.I.
- AP2-8P/6 **Nanocomposite thin-film structures and sensors based on them**
Salikhov R.B., Ostaltsova A.D., Salikhov T.R.
- AP2-8P/7 **CNT-Epoxy based transistor: fabrication and application**
Yumalin T.T., Salikhov R.B.
- AP2-8P/8 **Inelastic Electron Scattering Cross Section Spectroscopy of SiO₂/Si(111) Structures**
Parshin A.S.
- AP2-8P/9 **Features of the fractal relief of nanosized iron films**
Antonov A.S., Ivanov D.V., Semenova E.M., Ivanova A.L., Sdobnyakov N.Y.
- AP2-8P/10 **The fractal dimension behaviour of the domain patterns in ferrite-garnet films**
Zigert A.D., Dunaeva G.G., Semenova E.M., Kuz'min N.B., Sdobnyakov N.Y.
- AP2-8P/11 **The Model of Plasma Etching Using a Spherical Mask**
Syrov A.A., Tomilin S.V., Berzhansky V.N.
- AP2-8P/12 **Magnetic characteristics of a nanocomposite based on natural polymineral layered aluminosilicates doped with Fe₃O₄**
Dubas V.V., Aleksashkin I.V., Semuk E.Y., Polulyakh S.N.
- AP2-8P/13 **Investigation of the morphology of the surface of films**
Ostaltsova A. D., Salikhov T.R., Salikhov R.B.
- AP2-8P/14 **Design of strip microwave devices for characterization of garnet ferrite films**
Pavlyuk E.I., Kuzmichev A.N., Kholin A.A., Vetoshko P.M.

Wednesday, October 4**Day B****09:00 – 11:00****Plenary session****B1****Chairman:** Logunov M.V.B1-L/1 **Metamaterials for sensing**
Achanta V.G.B1-L/1 **Topological magnetic memory with multiply-connected planar magnetic nanoelements**
Metlov K.L*Coffee Break***11:30 – 13:00****Oral session****BO1****Section 1: Fundamental Physics of Functional Materials****Chairman:** Fridman Y.A.BO1-1O/1 **From Theory to Reality: Recent Advances in 2D Diamond Research (*Invited*)**
Sorokin P.B.BO1-1O/2 **Structure and state stability of magnetic vortex-like inhomogeneities in modulated ultrathin magnetic films**
Filippov M.A., Vakhitov R.M., Solonetsky R.V., Akhmetova A.A.BO1-1O/3 **Structure and properties of skyrmion-like inhomogeneities in ferromagnetic films with a columnar defect**
Ilyasova G.F., Vakhitov R.M., Solonetsky R.V.BO1-1O/4 **Discrete thermokinetic computational model of laser-induced phase transitions in phase-change materials**
Nevzorov A.A., Mikhalevsky V.A., Eliseev N.N., Kiselev A.V., Butsev A.A., Ionin V.V., Khmelenin D.N., Lotin A.A.BO1-1O/5 **Coupled spin-orbit dynamics of an anisotropic ferromagnet**
Butrim V.I., Osmanov R.S.BO1-1O/6 **Anomalous current-voltage characteristics of SFIFS Josephson junctions with weak ferromagnetic interlayers**
Vasenko A.S., Kazakova E.A., Karabassov T., Giranova A.V.

- BO1-10/7 **Phase states and excitation spectra of a non-Heisenberg ferrimagnet**
Fridman Y.A., Kosmachev O.A., Yarygina E.A., Matyunina Y.Y.
-

Lunch

15:00 – 16:00

Oral session

BO2

Section 1: Fundamental Physics of Functional Materials

Chairman: Polulakh S.N.

- BO2-10/1 **Determination of the isotropic gap for iron borate film taking into account the higher-order magnetoelastic invariants**
Prilepsky D.Y., Mogilenec Y.A. Seleznyova K.A., Yagupov S.V., Strugatsky M.B.
- BO2-10/2 **Electronic structure and exchange interactions in $Mn_{2-x}Zn_xSb$**
Golovchan A.V., Nirkov N.Y., Andreychenko E.P., Mitsiuk V.I., Mashirov A.V.
- BO2-10/3 **Detection of Packing Defects by X-ray Diffraction with Synchrotron Radiation Using**
Akimova O. V.
- BO2-10/4 **Effect of unintentionally doping on internal friction and functional properties of gallium oxide single crystals**
Panov D.Y., Kalганov D.A., Bauman D.A., Romanov A.E.

16:00 – 16:45

Oral session

BO3

Section 9: Materials for Medical and Environmental Applications.**Biosensors****Chairman:** Gusev A.N.

- BO2-90/1 **The method of Mandelstam-Brillouin spectroscopy for the stiffness properties of cancer cells in vitro**
A.B. Khutieva, M.V. Lomova, A.V. Sadovnikov
- BO2-90/2 **Reusable adsorbent based on boron nitride nanoparticles for effective antibiotic water purification**
Sorokina L.Yu., Kotyakova K.Yu.
- BO2-90/3 **Novel Zinc complex based on azomethine derivatives of 3-methyl-1-phenyl-pyrazol-5-one exhibiting bright blue fluorescence**
 Braga E.V., Gusev A.N., Nagaeva A.N.

17:30 – 18:30

Poster session

BP1

Section 1: Fundamental Physics of Functional Materials**Chairman:** Piskunov Y.V

- BP1-1P/1 **Optical excitation and registration of spin dynamics in epitaxial film of cation-substituted iron garnet with magnetic compensation temperature**
 Prilepsky I.V., Prisyazhnyuk A.V., Polulyakh S.N., Berzhansky V.N., Gusev N.A., Ignatyeva D.O., Zvezdin A.K., Belotelov V.I.
- BP1-1P/2 **Light-modified cubic anisotropy in (111) epitaxial films of impure iron garnet**
 Polulyakh S. N., Avdeenko D.V., Berzhansky V. N., Semuk E. Yu., Popov V. V., Vetoshko P. M., Belotelov V. I.
- BP1-1P/3 **Possible types of discrete breathers and their stability in linear chain of magnetic nanoparticles**
Bychkov I.V., Kuzmin D.A., Ekomasov E.G., Shavrov V.G.
- BP1-1P/4 **Effect of photomagnetic anisotropy and magnetoelastic interactions on FMR in epitaxial iron garnet films**
 Polulyakh S. N., Kholin A. A., Berzhansky V. N., Semuk E. Yu., Vetoshko P. M., Belotelov V. I.

- BP1-1P/5 **Raman scattering of RCO_3 ($\text{R} = \text{Y, Ho, Er, Lu}$) intermetallic compounds**
Ponomareva E.A., Neznakhin D.S., Druzhinin A.V., Radzivonchik D.I., Kuznetsova T.V.
- BP1-1P/6 **Segregation tendency of Ni-Co-Mn-Z ($\text{Z} = \text{Ga, In, Sn, Sb}$) Heusler alloys**
Erager K.R., Sokolovskiy V.V., Buchelnikov V.D.
- BP1-1P/8 **Magneto-optical studies of diamagnetically diluted iron borate single crystals**
Yagupov S.V., Seleznev K, Strugatsky M.B.
- BP1-1P/9 **Magnetoelastic invariants of higher orders for a trigonal easy-plane antiferromagnet**
Prilepsky D.Y., Seleznyova K.A., Strugatsky M.B.
- BP1-1P/10 **Faraday Effect in FeBO_3 Caused by the Magnetization Component Parallel to the C_3 Axis**
Zubov V.E., Kudakov A.D., Bulatov D.A., Strugatsky M.B., Yagupov S.V.
- BP1-1P/11 **Investigation of structural transitions of troilite from ordinary chondrite Calama 009**
Dyundik S.S., Maksimova E.M., Nauhatsky I.A.
- BP1-1P/12 **Singular points of an isotropic non-Heisenberg magnet**
Matyunina Y.Y., Kosmachev O.A., Fridman Y. A.
- BP1-1P/13 **Schiff-based cobalt (II) complexes as single-molecule magnets: structural features and relaxation dynamics**
Baluda Y.I., Gusev A.N., Kryukova M.A., Kiskin M.A., Yefimov N.N., Nemeč I.
- BP1-1P/14 **Logic gates Based on Carbon Nanotubes**
Dzedolik I.V., Tomilin S.V.
- BP1-1P/15 **Thermal expansion of epitaxial structures based on garnet**
Maximov G.S., Strugatsky M.B., Maximova E.M.
- BP1-1P/16 **Magnetic states of iron borate at high quasi-hydrostatic pressure**
Strugatsky M.B., Seleznyova K., Yagupov S.V.

Thursday, October 5**Day C****09:00 – 11:00****Plenary session****C1****Chairman:** Berzhansky V.N.C1-L/1 **Ultrafast magnetism of antiferromagnets**
Kimel A.C1-L/2 **Topological properties of Tamm plasmon polariton in one-dimensional photonic crystal covered by metasurface**
Timofeev I.V.

Coffee Break

11:30 – 12:15**Plenary session****C1**C1-L/3 **Ultrafast magnetism and domain walls**
Logunov M.V.**12:15 – 13:30****Oral session****CO1****Section 3: Plasmonics and Nanophotonics****Chairman:** Bychkov I.V.CO1-3O/1 **Magnetoplasmonic nanostructures for detection of Ru atoms (*Invited*)**
Hamidi S.M.CO1-3O/2 **Topological properties of Tamm plasmon polariton in one-dimensional photonic crystal covered by metasurface**
Fedchenko D.P., Zuev A.S., Timofeev I.V.

Lunch

15:00 – 16:30

Oral session

CO2

Section 3: Plasmonics and Nanophotonics**Chairman:** Bychkov I.V.

- CO2-30/1 **One-Dimensional Multiperiodic Photonic Structures (*Invited*)**
Lyubchanskii I.L.
- CO2-30/2 **Thin Film Phase-Change Materials for Photonic Applications**
Lotin A.A., Butsev A.A., Kiselev A.V., Ionin V.V., Nevzorov A.A.,
Mikhalevsky V.A., Eliseev N.N.
- CO2-30/3 **Phase-change material based active cells in polymer-based waveguide photonic devices**
Ionin V.V., Kiselev A.V., Burtsev A.A., Mikhalevsky V.A.,
Eliseev N.N., Sokolov V.I., Lotin A.A.
- CO2-30/4 **Controlling optical properties of GST thin films by ultrashort laser pulses series impact**
Kiselev A.V., Butsev A.A., Ionin V.V., Nevzorov A.A.,
Mikhalevsky V.A., Eliseev N.N., Lotin A.A.
- CO2-30/5 **Modulation of surface plasmon-polaritons on hyperbolic magnetoplasmonic metasurfaces**
Kuzmin D.A., Usik M.O., Bychkov I.V., Shavrov V.G.

16:30 – 17:30

Oral session

CO3

Section 8: Nanostructured Materials and Composites**Chairman:** Varyukhin V.N.

- CO3-80/1 **Investigation of optical properties of III-V nanoinclusions integrated into silicon**
Melnichenko I.A., Komarov s.d., Dragunova A.S., Moiseev E.I.,
Kryzhanovskaya N.V., Makhov I.S., Nadtochiy A.M., Ivanov K.A.,
Zhukov A.E.
- CO3-80/2 **Structure, surface morphology, magnetic and magnetocaloric properties of RCo₂ nanostructured materials**
Tereshina I.S., Kaminskaya T.P.
- CO3-80/3 **Superconducting diode effect in topological hybrid structures**
Vasenko A.S.

- CO3-80/4 **Magnetoelectric gyrator based on three-layer symmetrical structures: theory and experiment**
Filippov D.A., Udaltsova V.M., Laletin E.V., , Poddubnaya N.N., Zhang J.
- CO3-80/5 **Synthesis, structure and properties of double perovskites LnBaMn₂O₆ (Ln= Pr, Sm, Nd)**
Naumov S.V., Mostovshchikova E.V., Stepanov A.E.
- CO3-80/6 **Core-shell magnetite nanoparticles: morphology, magnetic properties, organic dyes adsorption**
Ivanova O.S., Edelman I.S., Svetlitsy E.S., Sokolov A.E., Zharkov S.M., Petrov D.A., Sukhachev A.L., Toropova E.S., Chun-Rong Lin., Ying-Zhen Chen
- CO3-80/7 **Effect of Inhomogeneous Magnetoelectric Interaction on Flat Magnetic Structures**
Magadeev E.B., Vakhitov R.M.

17:45 – 18:45

Poster session

CP1

Section 3: Plasmonics and Nanophotonics

Chairman: Tomilin S.V.

- CP1-3P/1 **Magneto-Plasmonic Effects in Nanocomposites**
Tomilin S.V., Berzhansky V.N., Tomilina O.A.
- CP1-3P/2 **Propagation of optical vortices in loop input-output resonator**
Aliyeva S.S., Alexeyev C.N., Yavorsky M.A.
- CP1-3P/3 **VO₂ Films for Photonics Applications**
 Syrov A.A., Kudryashov A.L., Lyashko S.D., Titov A.V., Berzhansky V.N., Tomilin S.V.
- CP1-3P/4 **Nanostructures of Bi-substituted iron garnets: scanning near-field optical and magnetic force microscopy**
 Mikhailova T.V., Ignatyeva D.O., Karki D., Levy M., Belotelov V.I.
- CP1-3P/5 **Exciton-like excitations in an imperfect one-dimensional lattice of micropores**
Bezus J.A., Rumyantsev V.V., Fedorov S.A.
- CP1-3P/6 **Metal-dielectric structures with magneto-optical iron garnet layers**
Mikhailova T. V., Lyashko S. D., Tomilin S. V., Osmanov S. V., Skorokhodov E. V., Gusev S. A., Karavainikov A. V., Kudryashov A. L., Berzhansky V. N., Shaposhnikov A. N.

CP1-3P/7 **Plasmonic Nanoparticles for Sensing Applications**
Tomilina O.A., Berzhansky V.N., Beltyukova A.G., Tomilin S.V.

17:45 – 18:45

Poster session

CP2

Section 7: Multiferroics and Magnetoelectric Materials

Chairman: Strugatsky M.B.

- CP2-7P/1 **Magnetic properties of synthetic $\text{Co}_3\text{Ge}_2\text{O}_5(\text{OH})_4$ hydrogermanate**
Belskaya N., Khrapova E., Ivanova A., Eremin E., Krasilin A.
- CP2-7P/2 **Magnetic circular dichroism of f-f transitions in multiferroic antiferromagnet $\text{Ho}_{0.75}\text{Nd}_{0.25}\text{Fe}_3(\text{BO}_3)_4$**
Malakhovskii A.V., Sokolov V.V., Sukhachev A.L., Gudim I.A.
- CP2-7P/3 **Temperature tuning of orthoferrite-based spin-Hall oscillator**
Meshcheryakov A.A., Safin A.R., Kalyabin D.V., Nikitov S.A., Mednikov A.M.
- CP2-7P/4 **Double perovskite $\text{PrBaMn}_2\text{O}_{6-\delta}$: synthesis by the method of intensive plastic deformation**
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