

Russian Academy of Sciences
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K.A.Valiev Institute of Physics and Technology of RAS Yaroslavl branch
National Research Nuclear University «MEPhI»
M.V. Lomonosov Moscow State University
Peter the Great St. Petersburg Polytechnic University

Dedicated to the centenary of birth of
A.D. Sakharov

PROGRAM
OF THE XXV INTERNATIONAL CONFERENCE ON
ION – SURFACE INTERACTIONS

(ISI – 2021)

23 – 27 August 2021

Yaroslavl 2021

Sponsors of ISI – 2021

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SCIENTIFIC SECTIONS

1. **Sputtering, surface erosion, desorption.**
2. **Ion scattering, emission of ions, electrons, photons and X-rays under ion-surface interaction.**
3. **Ion implantation, surface modification and surface analysis.**
4. **Ion-assisted processes in nanostructures and thin films.**
5. **Plasma-surface interaction – physics and technology.**
6. **Ion irradiation in biology and medicine.**

23 August, Monday

PLENARY SESSION

Chair: V. Bachurin

- 8³⁰-10⁰⁰ REGISTRATION OF THE PARTICIPANTS
- 10⁰⁰-10¹⁰ OPENING OF THE CONFERENCE (A.I. Rusakov)
- 10¹⁰-10³⁰ **Andrei Titov**, Jubilee 25 IC ISI 2021
- 10³⁰-10⁵⁵ **John Colligon**, *UK*
Medical Applications of ion beams
- 11⁰⁰-11²⁵ **Peter Sigmund**, *Denmark*
Ion Electronic stopping below 10 keV/u.
- 11³⁰-11⁵⁵ *Coffee break*
- 12⁰⁰-12²⁵ **Thomas Michely**, *Germany*
Ion beam induced magic vacancy cluster meshes in 2D materials.
- 12³⁰-12⁵⁵ Taking a photo of the conference participants
- 13⁰⁰-14⁰⁰ *Lunch*

23 August, Monday

Section 1. Sputtering, surface structure, desorption

Chairs: J. Colligon, O. Trushin

- 14⁰⁰-14²⁵ **Arnaud Delcorte, Belgium**
New cluster ion beam-based approaches for (bio) surface tailoring and analysis.
- 14³⁰-14⁵⁵ **Kai Nordlund, Finland**
Strong dependence of W sputtering on surface crystal orientation.
- 15⁰⁰-15²⁵ **Dmitry Kalanov, Germany**
Ion beam sputtering of gallium oxide.
- 15³⁰-15⁵⁵ **Gabriel Szabo, Austria**
Nanohillock formation on CaF₂ due to cluster-ion irradiation.
- 16⁰⁰-16¹⁵ Tea break
- 16¹⁵-16³⁰ **A.E. Ieshkin, V.S. Chernysh, D.S. Kireev, E.A. Skryleva, B.R. Senatuli.**
Sputtering of Ni-based alloys with gas cluster ions.
- 16³⁵-16⁵⁰ **D.S. Meluzova, P.Yu. Babenko, A.N. Zinoviev, A.P. Shergin.**
Simulation of ion irradiation of crystalline and amorphous targets – TOKAMAK-reactor first wall materials.
- 16⁵⁵-17¹⁰ **A. Tolstoguzov, P. Mazarov, S.I. Gusev.**
Sputtering of silicon by atomic and cluster bismuth ions: an influence of projectile nuclearity and specific kinetic energy on the sputter yield.
- 17¹⁵-17³⁰ **O.V. Ogorodnikova, N.S. Klimov, Yu.M. Gasparyan, Z.R. Harutyunyan, V.S. Efimov, D. Kovalenko, K. Gutorov, A.G. Poskakalov, M.M. Kharkov, A.V. Kaziev.**
Surface modifications of W-based materials under helium and deuterium ion implantation.
- 17³⁵-17⁵⁰ **I.V. Nikolaev, N.G. Korobeishchikov, P.V. Geydt, V.I. Strunin.**
Influence of treatment with argon cluster ions on the surface morphology of aluminum nitride.
- 17⁵⁵-18¹⁰ **N.G. Korobeishchikov, I.V. Nikolaev, V.V. Yakovlev.**
Peculiarities of cluster ion sputtering of hygroscopic borate single crystal surfaces.

- 18¹⁵-18³⁰ **V.I. Bachurin, L.A. Mazaletsky, D.E. Pukhov, M.A. Smirnova, A.B. Churilov, A.S. Rudy.**
Study of the development of topography on silicon surface irradiated by a gallium ion beam
- 18³⁵-18⁵⁰ **S.V. Kurbatov, A.S. Rudy, O.V. Morozov.**
Fabrication of a microstructured silicon substrate for 3D all-solid-state lithium-ion batteries.
- 19⁰⁰-20⁰⁰ **POSTERS, 1 and 2 sections**
- 20⁰⁰-20³⁰ Dinner

24 August, Tuesday

9⁰⁰-10⁰⁰ POSTERS, 3 and 4 sections

Section 2. Ion scattering and propagation, emission of ions, electrons, photons and X-rays under ion-surface interaction

Chairs: A. Delcorte, G. Kornich

- 10⁰⁰-10²⁵ **Roger Webb, UK**
New cluster ion beam-based approaches for (bio)surface tailoring and analysis.
- 10³⁰-10⁵⁵ **Vanina Cristaudo, Belgium**
Large substrate effect on the organic ion yields in SIMS analysis using Ar-GCIB.
- 11⁰⁰-11²⁵ **Dirk Reiser, Germany**
Data driven continuum models of surface dynamics - inference of atomistic parameters.
- 11³⁰-11⁵⁵ **Guanghua Du, China**
The Interdisciplinary Application of a GeV Single Ion Microbeam.
- 12⁰⁰-12¹⁵ *Coffee break*
- 12¹⁵-12³⁰ **V.K. Egorov, E.V. Egorov, A.A. Galitsin.**
X-ray emission induced by high energy excitation for element analysis of nanostructures
- 12³⁵-12⁵⁰ **Yu.A. Melkozerova, I.K. Gainullin.**
Three-dimensional modelling of charge exchange between atomic particle and surface with adsorbates.
- 12⁵⁵-13¹⁰ **N.V. Novikov.**
Evaluated charge – changing cross section data.
- 13¹⁵-13³⁰ **E.Yu. Zykova, E.I. Rau, A.A. Tatarintsev, I.K. Gainullin, K.E. Ozerova, V.V. Khvostov, K.F. Minnebaev.**
Change in charging state of insulators irradiated by charged particles of medium energy.
- 13³⁵-14³⁰ *Lunch*

24 August, Tuesday

Section 3. Ion implantation and surface modification

Chairs: K. Nordlund, F. Djurabekova

- 14³⁰-14⁵⁵ **Facsco Stefan, Germany**
Nanopatterning of crystalline Ge (001) surfaces by ion irradiation at off-normal incidence
- 15⁰⁰-15²⁵ **Anna Mackova, Czech Republic**
Key role of ion beam technologies for application in microelectronics, optics and sensors.
- 15³⁰-15⁵⁵ **Vladimir Popov, Russia**
Quantum technologies based on the NV point defects created in diamond by implanted ions.
- 16⁰⁰-16¹⁵ **A. Azarov, V. Venkatachalapathy, E. Monakhov, A. Kuznetsov.**
Dose-rate effect in β -Ga₂O₃.
- 16²⁰-16³⁵ *Tea break*
- 16⁴⁰-16⁵⁵ **N.N. Andrianova, A.M. Borisov, A.V. Makunin, E.S. Mashkova, M.A. Ovchinnikov, E.A. Vysotina.**
Surface structure modification of PAN based carbon fibers by high fluence ion irradiation.
- 17⁰⁰-17¹⁵ **M.A. Makhavikou, F.F. Komarov, O.V. Milchanin, I.N. Parkhomenko, L.A. Vlasukova, V.A. Skuratov, A. Janse van Vuuren, D.S. Korolev, E. Wendler, A.V. Mudryi.**
Structure-phase composition and luminescence of SiO₂ layers implanted with Zn ions: influence of the degree of supersaturation and heat treatment.
- 17²⁰-17³⁵ **A.A. Nikolskaya, D.S. Korolev, A.N. Mikhaylov, T.D. Mullagaliev, Yu.I. Chigirinsky, A. I. Belov, A. V. Nezhdanov, V. N. Trushin, D.E. Nikolichev, A.V. Almaev, R. Giulian, M. Kumar, D.I. Tetelbaum.**
Ion-beam modification of the structure and properties of gallium oxide.
- 17⁴⁰-17⁵⁵ **K.V. Rudenko, S.G. Simakin, S.M. Tarkov, A.K. Gutakovsky, V.I. Vdovin, V.A. Antonov, F.V. Tikhonenko, V.P. Popov.**
Carboxide insulating layers with implanted molecular CO⁺ ions in silicon and SOI structures

- 18⁰⁰-18¹⁵ **D.V. Shyrokora**d, **G.V. Kornich**, **S.G. Buga**.
Controlled modifications of the bimetallic janus-like nanoclusters under low energy Ar_n impacts.
- 18²⁰-18³⁵ **S.A. Krivelevich**. Ion implantation and tristate transistors.
- 18⁴⁰-18⁵⁵ **A.I. Titov**, **K.V. Karabeshkin**, **A.I. Struchkov**, **P.A. Karaseov**, **A. Azarov**. Amorphization of GaN during consecutive irradiation by ions of different types and energies.
- 19⁰⁰19¹⁵ **V.A. Andrianov**, **K.A. Bedelbekova**, **A.L. Tregub**.
Fe implantation into metallic Mo and Ta: Mossbauer effect and EXAFS.
- 19²⁰-19³⁵ **A.V. Almaev**. Ion implantation for MOSFETs based on β-Ga₂O₃
- 20⁰⁰-20³⁰ *Dinner*

25 August, Wednesday

Section 4. Ion-assisted processes in thin films and nanostructures

Chairs: A. Krashennnikov, A. Titov

- 10⁰⁰-10²⁵ **Andrej Kuznetsov, Norway**
Frenkel pairs versus secondary defects balance in ion irradiated semiconducting oxides.
- 10³⁰-10⁵⁵ **Katharina Lorenz, Portugal**
Radiation sensors based on GaN microwires.
- 11⁰⁰-11²⁵ **Flyura Djurabekova, Finland.**
Electron dynamics during swift heavy ion irradiation of graphene.
- 11³⁰-11⁴⁵ *Coffee break*
- 11⁴⁵-12⁰⁰ **M.V. Sorokin, K. Schwartz, S.O. Aisida, I. Ahmad, M. Izerrouken, A.N. Khodan.**
On track core formation in lithium fluoride crystals irradiated with swift heavy ions.
- 12⁰⁵-12²⁰ **D.S. Korolev, A.A. Nikolskaya, A.N. Mikhaylov, A.I. Belov, A.A. Konakov, D.A. Pavlov, D.I. Tetelbaum.**
Properties of ion-synthesized 9R-Si nanoinclusions: theory and experiment.
- 12²⁵-12⁴⁰ **Ph.V. Kiryukhantsev-Korneev, P.A. Loginov, Yu. Kaplansky, A. Orekhov, A.D. Sytchenko, E.A. Levashov.**
DCMS and HIPIMS ZrB₂-based protective coatings: in-situ TEM study of structural-phase transformations.
- 12⁴⁵-13⁰⁰ **G.E. Remnev.**
Modification of the material surface layer under the action of high-intensity nanosecond ion beams.
- 13⁰⁵-13²⁰ **O.S. Trushin, A.A. Popov, A.N. Pestova, L.A. Mazaletsky, A.A. Akulov.**
Nanostructuring at oblique angle deposition.
- 13²⁵-13⁴⁰ **A.K. Mutali, V.A. Skuratov, A.D. Ibrayeva, A.T. Zhumazhanova, A. Dauletbekova, A.Akilbekov, M.V. Zdorovets.**
Swift heavy ion irradiation induced amorphization and mechanical stresses in Si₃N₄.

- 13⁴⁵-14¹⁰ **André Schleife, USA**
Pre-equilibrium effects and dynamic ionic charge in 2D materials
under particle radiation.
- 14³⁰-15⁰⁰ Lunch
- 15⁰⁰-20⁰⁰ **Excursions**
- 20⁰⁰-22⁰⁰ *Dinner*

26 August, Thursday

9⁰⁰-10⁰⁰ *POSTERS, 5 and 6 section*

Section 4. Ion-assisted processes in thin films and nanostructures

Chairs: T. Michely, P. Karaseov

- 10⁰⁰-10²⁵ **Anna Niggas, Austria**
The interaction of highly charged ions with atomically thin materials.
- 10³⁰-10⁵⁵ **Arkady Krasheninnikov, Helmholtz Zentrum Dresden-Rossendorf, Germany**
Production of defects in two-dimensional materials under ion irradiation: insights from first-principles and analytical potential molecular dynamics simulations.
- 11⁰⁰-11²⁵ **Sergei Kucheyev, USA**
Energetic condensation of ultra-thick films and coatings.
- 11³⁰-11⁵⁵ **Ambuj Tripathi, India**
Ion beam induced modifications in carbon based 2D materials.
- 12⁰⁰-12¹⁵ *Coffee break*
- 12¹⁵-12³⁰ **S.M. Novikov, J. Fiutowski, N.V. Doroshina, A.V. Arsenin, V.S. Volkov, V.N. Popok.**
Focused ion beam graphene patterning and nanoparticle deposition for plasmonic applications
- 12³⁵-12⁵⁰ **E.A. Korneeva, A. Ibrayeva, J.O'Connell, A.Mutali, A.S. Sohatsky, T.N. Vershinina, V.A. Skuratov, M.Zdorovets, L.S. Alekseeva, A.V. Nokhrin.**
TEM study of Y-Ti-O and Y-Al-O in ODS alloys irradiated with swift heavy ions.
- 12⁵⁵-13¹⁰ **Yu. Petrov, O. Vyvenko, O. Gogina, K. Bolotin, S. Kovalchuk.**
Effect of ion irradiation on cathodoluminescence of hexagonal boron nitride.
- 13¹⁵-13³⁰ **R.A.Rymzhanov, N.Medvedev, A.E. Volkov.**
Track formation in insulators under normal and grazing incidence swift heavy ion impacts.
- 13³⁰-14³⁰ Lunch

26 August, Thursday

Section 5. Plasma-surface interaction - physics and technology

Chairs: Yu. Gasparyan, A. Pisarev

- 14³⁰-14⁵⁵ **Christian Linsmeier**, *Institut für Energie- und Klimaforschung - Plasmaphysik, Germany*
Influence of plasma impurities on the fuel retention in tungsten.
- 15⁰⁰-15²⁵ **Stepan Krat**, *MEPhI, Russia*.
Deuterium trapping in co-deposited layers of ITER-relevant materials.
- 15³⁰-15⁵⁵ **Christian Grisolia**. *France*
Dust in tokamak and related safety open issues.
- 16⁰⁰-16²⁵ **Christian Cupak**, *Austria*
Studying plasma-wall-interaction processes in the laboratory using a sensitive quartz crystal microbalance.
- 16³⁰-16⁴⁵ *Tea break*
- 16⁴⁵-17¹⁰ **Georgy Vinogradov**, *Russia*
Modern etching technologies in nanoelectronics.
- 17¹⁵-17³⁰ **N.A. Puntakov, L.B. Begrambekov, G.D. Dolganov, A.V. Grunin**.
Sputtering and porous layer formation in graphite under high temperature ion irradiation.
- 17³⁵-17⁵⁰ **Z. Harutyunyan, Yu. Gasparyan, A. Pisarev, A. Litnovsky, F. Klein, Ch. Linsmeier**.
Comparison of deuterium retention in tungsten and WCrY alloy in the presence of helium.
- 17⁵⁵-18¹⁰ **N.N. Cherenda, V.V. Uglov, I.S. Rogovaya, V.I. Shymanski, V.M. Astashynski, A.M. Kuzmitski, Yu.F. Ivanov, V.V. Shugurov, N.A. Prokopenko, E.A. Petrikova**. Multicomponent surface layer synthesis in titanium under the impact of compression plasma flows.
N.N. Cherenda, V.V. Uglov, A.V. Basalai, A.Yu. Isobello, V.M. Astashynski, A.M. Kuzmitski. Structure and phase composition of Ti-6Al-4V alloy surface layer doped with copper atoms under the impact of compression plasma flows.

- 18¹⁵-18³⁰ **N.N. Nikitenkov, A.N. Sutygina, V.S. Sypchenko, Yu.I. Tyurin, Le Zhang.**
On the issue of craters on the metals surface after immersion implantation from the plasma of a vacuum arc discharge.
- 18³⁵-18⁵⁰ **L.B. Begrambekov, S.A. Dovganyk, Yu.G. Rukina, N.N. Kasimova.**
Trapping and retention of gases in layers formed on metals during plasma deposition of aluminum atoms.
- 18⁵⁵-19¹⁰ **I.I. Amirov, R.V. Selyukov, V.V. Naumov.**
Effect of ion-plasma treatment on the electric conductivity of nanometer thickness tungsten films
- 19¹⁵-19³⁰ **V.S. Zheltukhin, I. Sh. Abdullin, D.D. Nicholson.** Simulation of a polyethylene surface modification by a low-intensity ion flow in a low-pressure RF discharge.
- 20⁰⁰-22⁰⁰ *Conference dinner*

27 August, Friday

Section 6. Ion irradiation in biology and medicine

Chairs: R. Webb, V. Bachurin

- 10⁰⁰-10²⁵ **Katia Parodi, Germany**
Challenges and prospects of high precision ion beam therapy
- 10³⁰-10⁵⁵ **Elke Wendler, Germany**
Radiation damage and thin film stress in ion implanted layers
- 11⁰⁰-11¹⁵ **F.A. Doronin, A.V. Savitskaya, N.N. Bozko, G.O.Rytikov, N.A. Bogdanova, V.G. Nazarov.**
Structure and properties plasma-chemical modified polymer substrates for additive manufacturing.
- 11²⁰-11³⁵ **M.Yu. Karganov, I.B. Alchinova, M.V. Polyakova, F.O. Akhmetov, P.A. Babaev, S.A. Gorbunov, T. Friedrich, R.A. Rymzhanov, E.A. Nasonova, A.E. Volkov.**
Modeling of dry DNA damage by heavy components of cosmic rays: accelerator experiments and simulations.
- 11⁴⁰-11⁵⁵ *Coffee break*
- 12⁰⁰-11¹⁵ **P. Ada Bibang, A.N. Agnihotri, P. Boduch, A. Domaracka, Z. Kanuchova, H. Rothard.**
Radiolysis of pyridine-water ices by ion irradiation.
- 12²⁰-12²⁵ **V.S. Chudinoy, I.N. Shardakov, V.V. Litvinov, S.Yu. Solodnikov, S.V. Galkin, Ya.V. Savitsky, A.V. Kondyurin.**
High energy ion beam treatment of inner surface of polymer vascular shunt for small diameter blood vessels.
- 12⁴⁰-12⁵⁵ **A.S. Grenadyorov, A.A. Solovyev, K.V. Oskomov, M.O. Zhulkov, A.M. Chernyavskiy, D.A. Sirota, N.A. Karmadonova, V.V. Malashchenko, L.S. Litvinova, O.G. Khaziakhmatova, N.D. Gazatova, I.A. Khlusov.**
Surface modification of VT6 titanium alloy for medical applications
- 13⁰⁰-13⁴⁵ **Summary and closing**
- 14⁰⁰-14³⁰ *Lunch*
- 14³⁰ and later Departure of participants from Yaroslavl

POSTER REPORTS

23 August, Monday

Section 1. Sputtering, surface erosion, desorption

1. **B.G. Atabaev, R. Dzabbarganov, F.R. Yuzikaeva, M.A. Permukhamedova, A.S. Khalmatov.** Temperature dependencies of negative ion silicon cluster sputtering.
2. **N.E. Efimov, D.N. Sinelnikov, D.G. Bulgadaryan, Y.M. Gasparyan, E.D. Vovchenko, E.D. Marenkov.** Application of LIBS, LA-QMS, LA-TOF-MS for fusion relevant materials analysis.
3. **L. Forlano and A. I. Tolmachev.** Angle of incidence dependence of the sputtering yield at ion bombardment of solids.
4. **A.K. Homiakov, S.A. Krat, A.S. Prishvitsyn, E.A. Fefelova, Y.M. Gasparyan, A.A. Pisarev.** The influence of ultraviolet radiation on the content and desorption of deuterium from co-deposited lithium films.
5. **I.A. Kanshin, N.V. Mamedov, A.A. Solodovnikov, N.E. Efimov.** Estimation of the electrodes sputtering of the miniature liner accelerator.
6. **R.Kh. Khisamov, A.M. Borisov, M.A. Ovchinnikov, E.S. Mashkova, R.R. Mulyukov.** The effect of nickel submicrocrystalline structure on the cones formation on the surface under ion irradiation and their thermal stability.
7. **R.Kh. Khisamov, R.R. Timiryayev, S.N. Sergeev, E.A. Korznikova, K.S. Nazarov, R.U. Shayakhmetov, G.F. Korznikova, R.R. Mulyukov.** Irradiation of magnesium by argon ions with energy 5 keV, processed by severe plastic deformation.
8. **S.A. Krat, E.A. Fefelova, A.S. Prishvitsyn, Yu.M. Gasparyan, A.A. Pisarev.** Influence of helium on the deuterium accumulation in co-deposited tungsten films.
9. **Ma Xiaole, Zhang Hongru, Y.I. Tyurin.** Research and modeling of the release of hydrogen from titanium and nickel during linear heating.
10. **S.E. Maksimov, B.L. Oksengendler, Kh. B. Ashurov, N.Yu. Turaev, Sh.T. Khozhiev.** Cluster formation under ion sputtering: synergetics and combinatoric mechanism.
11. **A. Merkulov.** Ultra-low impact energy sputtering using Dynamic Secondary Ion Mass Spectrometry.
12. **V.S. Mikhailov, D.S. Meluzova, P.Yu. Babenko, A.N. Zinoviev.** Sputtering of a tungsten surface by a stream of backscattered light atoms.
13. **A.I. Musin, V.N. Samoilo.** The formation of energy distribution of atoms ejected from Ni (100) surface and observed in small spatial angle.
14. **A.B. Nadiradze, D.V. Struchalin.** Angular dependence of the sputtering coefficient of a lattice of parallel cylindrical rods.
15. **K.S. Nazarov, R.Kh. Khisamov, R.R. Timiryayev, R.R. Mulyukov.** Low-energy ion sputtering of ultrafine grained tungsten by Ar⁺ ions.
16. **O.V. Podorozhniy, A.V. Rumyantsev, N.I. Borgardt.** Determination of the surface binding energy for sputtering simulation of binary materials by gallium ions using Monte Carlo method.
17. **A.V. Rumyantsev, N.I. Borgardt, R.L. Volkov.** Sputtering yield angular dependence in gallium focused ion beam milling of silicon dioxide.
18. **V.S. Sypchenko, N.N. Nikitenkov, Yu.I. Tyurin, Le Zhang.** Thermally stimulated desorption from titanium, Zr-1% Nb zirconium alloy and Ti / Zr-1% Nb thin film system.
19. **O.A. Tomilina, V.N. Berzhansky, S.V. Tomilin, A.A. Syrov.** The formation of edge with smoothed profile for epitaxial ferrite-garnet films using the method of ionic etching.

20. **Y.I. Tyurin, N.N. Nikitenkov, V.S. Sypchenko, Xiaole Ma, Hongru Zhang.** Simulation of thermostimulated hydrogen release from Ti, Zr, Pd, Ni.

23 August, Monday

Section 2. Ion scattering, emission of ions, electrons, photons and X-rays under ion-surface interaction

1. **V.P. Afanas'ev, P.S. Kaplya, L.G. Lobanova.** The effect of multiple scattering on the accuracy of determining the concentration of hydrogen isotopes using ERBS spectroscopy.
2. **I.O. Afanasieva, M.O. Azarenkov, V.V. Bobkov, V.V. Gritsyna, I.I. Okseniuk, D.I. Shevchenko.** Comparison of the spatial distribution of the radiation of excited particles sputtered from the garnets and metals under ion bombardment.
3. **P.Yu. Babenko, A.N. Zinoviev.** Calculation of nuclear stopping in the semiclassical approximation.
4. **E.R. Burmistrov, L.P. Avakyants.** Implementation of non-equilibrium Auger - transition during surfaces sputtering by corpuscular probes.
5. **V.V. Evstifeev, N.V. Kostina.** Anisotropy of the recoil energy during bombardment of a single crystal by slow ions.
6. **N.A. Ivanov, V.L. Paperny, S.S. Kolesnikov, L.I. Bryukvina, S.A. Nebogin.** X-ray diffractometry of thin polycrystalline films of lithium fluoride with silver nanoparticles on an amorphous substrate.
7. **V.P. Koshcheev, Yu.N. Shtanov.** Simulation of electronic terms of diatomic molecules in the first order of perturbation theory.
8. **V.A. Litvinov, I.I. Okseniuk, D.I. Shevchenko, V.V. Bobkov.** Study of secondary ion emission during the interaction of Zr²Fe getter alloy with oxygen.
9. **M.N. Makhmudov, E.N. Moos.** Features of selective photoionization in ion spectroscopy.
10. **V.S. Mikhailov, P. Yu. Babenko, A.P. Shergin, A.N. Zinoviev.** Lifetime of the 2p π -vacancies and Auger transitions in the quasimolecule Ne⁺-Ne.
11. **S.S. Moskalenko, I.K. Gainullin.** Theoretical study of charge transfer between metal surface and three-dimensional atomic states.
12. **S.S. Volkov, T.I. Kitaeva, S.V. Nikolin, A.A. Kotchurov, N.L. Puzevitch.** Charging processes on the surface and interfacial borders.
13. **Yaoming Wang, Y.I. Tyurin, N.N. Nikitenkov, V.S. Sypchenko.** Non-stationary luminescent methods for studying the interaction of hydrogen atoms beam with surface of solids.
14. **V.E. Yurasova, K.A. Tolpin.** Spatial distribution of secondary ions from single crystal and amorphous targets.

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Section 3. Ion implantation, surface modification and surface analysis

1. **B. Batgerel, I.V. Puzynin, T.P. Puzynina, I.G. Hristov, R.D. Hristova, Z.K. Tukhliyev, Z.A. Sharipov.** Molecular dynamics simulation of processes in metals with prescribed structure defects under irradiation with metal nanoclusters.
2. **E.Yu. Buchin, Yu.I. Denisenko.** Ion synthesis of SOI structures with lead-silicate insulator.
3. **Yu.A. Danilov, I.N. Antonov, V.A. Bykov, O.V. Vikhrova, Yu.A. Dudin, R.N. Kriukov, A.V. Kudrin, A.V. Nezhdanov, E.A. Pitirimova, M.N. Drozdov,**

- A.E. Parafin, Yu.A. Agafonov, V.I. Zinenko.** Studing the properties of GaAs, bombarded by ions of iron and manganese with followed pulsed laser annealing.
4. **S.B. Donaev, B.E. Umirzakov, A.K. Tashatov, G.M. Shirinov, N.M. Mustafaeva.** Dependence of the parameters of energy bands on the depth of the ion-doped layer for Si implanted with ions Ba⁺.
 5. **S. B. Donaev, E. Rabbimov, B. E. Umirzakov, B. D. Donaev, G. M. Shirinov.** Effect of implantation of barium ions and oxygen on the emission properties of Mo, Pd and Pd-Ba.
 6. **B.F. Farrakhov, A.L. Stepanov, Ya.V. Fattakhov, D.A. Konovalov, V. I. Nuzhdin, V.F. Valeev.** Incoherent-light pulse annealing of nanoporous germanium layers formed by ion implantation.
 7. **Yu.V. Goryunov.** About role of Ehrlich - Schwoebel barrier in implantation dopping by means accelerating ions.
 8. **V.S. Kalinovskii, E.V. Kontrosh, I.A. Tolkachev, K.K. Prudchenko, E.A. Makarevskaya, D.A. Novikov, V.M. Mikoushkin.** Diode effect of the p-n structure formed on the n-GaAs surface by low-energy Ar⁺ ions.
 9. **R.Kh. Khasanshin, D.A. Primenko.** Analysis of the results of the influence of 30-keV protons on the K-208 glass plates.
 10. **V.S. Klimin.** Formation of autoemission elements on Si surface by comby ion-plasmatic technology.
 11. **M.Mamatova, V.A. Skuratov, A. Olejniczak, A.K. Dauletbekova, S.G. Giniyatova.** Time-resolved photoluminescence of Al₂O₃ irradiated with 1.2 – 3 MeV/amu.
 12. **N.S. Melesov, E.O. Parshin.** Determination of the oxygen concentration profile in thin films of Si-O-Al by elastic (non-Rutherford) backscattering spectrometry (EBS).
 13. **E.N. Moos, E.B. Trunin, I.A. Zeltser.** Capture of nitrogen ions by electrodes from the discharge plasma.
 14. **A.V. Nazarov, A.D. Zavilgelsky, V.S. Chernysh, Alvaro Lopez-Cazalilla, Flyura Djurabekova, Kai Nordlund.** The noble gas cluster species effect on the cluster-surface interaction.
 15. **S.J. Nimatov, B.Y. Umirzakov, F.Y. Xudayqulov.** Features of formation of monomolecular films of complex composition on silicon surface during ionic implantation and spraying
 16. **S.J. Nimatov, B.Y. Umirzakov, F.Y. Xudayqulov.** Complex study of the composition and structure of the surface layers of ion-implanted tungsten with cylindrical shape.
 17. **E.O. Parshin, N.S. Melesov.** Investigation of the defect profiles evolution during thermal annealing of silicon amorphized by germanium ions implantation.
 18. **V.V. Poplavsky, O.G. Bobrobich, A.V. Dorozhko, V.G. Matys.** Surface modification of nafion membrane electrolyte by ion beam assisted deposition of platinum and rare earth metals from vacuum arc discharge plasma.
 19. **V.V. Privezentsev, A.P. Sergeev, A.A. Firsov, V.S. Kulikauskas, E.E. Yakimov, A.N. Tereshchenko.** Study of Zn implanted SiO₂ films for memristor application.
 20. **A.A. Rezvan, V.S. Klimin, R.V. Tominov.** Topology modification of SiC surface for following pale.
 21. **N.A. Sobolev, A.E. Kalyadin, E.I. Shek, K.F. Shtel'makh.** Luminescence in silicon, implanted oxygen ions.
 22. **.Sh. Sodikjanov, B.E. Umirzakov, Z.A. Isakhanov, R.M. Yorkulov.** Study of the emission and optical properties of CdS under the adsorption of Ba atoms.
 23. **D.A. Tashmukhamedova, B.E. Umirzakov, M.B. Yusupjanova, A.N. Urokov, S.T. Gulyamova, F.F. Riskiniboev.** Obtained of SiO₂ layers in the surface region of Si implantation of O₂⁺ ions.

24. **D.A. Tashmukhamedova, B.E. Umirzakov, A.A. Abduvaitov, X.X. Boltaev, J.Sh. Sodikjanov, S.X. Odilov.** Influence of adsorption of Ba atoms on the electronic properties of CdS monocrystals.
25. **A.I. Titov, K.V. Karabeshkin, P.A. Karaseov, A.I. Struchkov, A.I. Pechnikov, V.I. Nikolaev, A. Azarov, D.S. Gogova.** Nitrides vs oxides: ion-induced damage formation in GaN and Ga₂O₃.
26. **A.V. Zdoroveyshchev, M.V. Ved, Yu.A. Danilov, P.B. Demina, M.V. Dorokhin, Yu.A. Dudin, D.A. Zdoroveyshchev, A.V. Kudrin, V.E. Kotomina, Yu.M. Kuznetsov.** Application of ion implantation to create a magnetically controlled light-emitting diode.

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Section 4. Ion-assisted processes in nanostructures and thin films

1. **A.A. Abduvaitov, Kh.Kh. Boltaev, G.A. Rozikov, Ж.Б. Хужаниязов.** Electronic and optical properties of Si with nanocrystals and silicide nanofilms.
2. **A.S. Babushkin, A.N. Kupriyanov.** Molecular dynamics study of mechanical stress formation in polycrystalline Cr films and the effect of Ar ion bombardment during and after deposition.
3. **M.D. Gritskovich, D.V. Fominski, R.I. Romanov, V.Yu. Fominski.** Expansion of laser plasma in hydrogen sulfide and formation of thin-film a-C (S, H) coatings with high-quality antifriction properties.
4. **I.L. Kalentyeva, O.V. Vikhrova, Yu.A. Danilov, Yu.A. Dudin, A.V. Zdoroveyshchev, A.V. Kudrin, M.V. Dorokhin, Yu. M. Kuznetsov, M.P. Temiriazeva, A.G. Temiriazev, A.V. Sadovnikov, P.A. Unin.** Influence of ion irradiation on the magnetic properties and domain structure of thin CoPt films.
5. **R.Kh. Khisamov, R.R. Timiryayev, S.N. Sergeev, E.A. Korznikova, K.S. Nazarov, R.U. Shayakhmetov, G.F. Korznikova, R.R. Mulyukov.** Irradiation of magnesium by argon ions with energy 5 keV, processed by severe plastic deformation.
6. **S.V. Konstantinov, F.F. Komarov, V.A. Zaykov.** Effect of proton irradiation on the structural and mechanical properties of nanostructured TiZrSiN coatings.
7. **E.A. Makarevskaya, S.Yu. Nikonov, D.A. Novikov, A.P. Solonitsyna, D.E. Marchenko, V.M. Mikoushkin.** Ar⁺ ions bombardment effect on core-level binding energies of the *n*-GaAs surface
8. **S.E. Maksimov, B.M. Abdurakhmanov, Kh.B. Ashurov, F.G. Djurabekova, Sh.K. Kuchkanov, S.J. Nimatov.** Influence of the ionic component on the processes of EMF and current generation in Si / Si film structures obtained by vacuum deposition.
9. **E.V. Okulich, V.I. Okulich, D.I. Tetelbaum, A.N. Mikhaylov.** Simulation of the initial stage of Si cluster formation upon post-implantation annealing of SiO₂.
10. **E.V. Okulich, V.I. Okulich, D.I. Tetelbaum, A.N. Mikhaylov, A.V. Zdoroveishchev, V.L. Vorobyev.** Effect of silicon ion implantation in silicon oxide films on the parameters of resistive switching of memristors on their basis.
11. **S.K. Pavlov, F.V. Konusov, A.L. Lauk, R.M. Gadirov, V.A. Tarbokov, G.E. Remnev.** Influence of short-pulsed ion irradiation on the optical properties of Al-Si-N coatings.
12. **O.A. Podsvirov, A.I. Sidorov, D.A. Kirpichenko, U.V. Yurina.** Radiation effect of 50 keV electron irradiation on quartz structure.
13. **A.V. Prokaznikov, V.A. Paporkov, V.A. Chirikov.** Features of magneto-optical response of nanostructures formed in various regimes of ion surface treatment.
14. **R.V. Selyukov, M.O. Izyumov, V.V. Naumov, L.A. Mazaletskiy.** Changes of the texture of Ti films caused by ion-plasma treatment.

15. **A.P. Solonitsyna, E.A. Makarevskaya, D.A. Novikov, V.M. Mikoushkin.** Arsenic diffusion in the GaAs oxide irradiated by Ar⁺ ions.
16. **O.A. Soltanovich, S.V. Koveshnikov, A.V. Kovalchuk, S.Yu. Shapoval.** Impact of ECR hydrogen plasma treatment on the properties of silicon oxide and silicon nitride dielectric films.
17. **O.A. Streletskiy, I.A. Zavidovskiy, S.M. Novikov, N.V. Doroshina, V.V. Sychev, D.E. Tatarkin, M.S. Mironov, A.V. Arsenin, V.S. Volkov.** High stable silver nanoparticles for sensing applications from dual magnetron ion-stimulated deposition.
18. **A.A. Sycheva, E.N. Voronina.** Irradiation of nanoporous structures with light and heavy low-energy ions.
19. **A.D. Sytchenko, Ph.V. Kiryukhantsev-Korneev.** Structure and properties of Ta-Si-N coatings obtained at different Ar/N₂ ratio.
20. **S.V. Tomilin, V.N. Berghansky, A.N. Shaposhnikov A.A. Fedorenko, O.A. Tomilina.** Ion-stimulated diffusion on “film-substrate” interface during ionic sputtering of film surface.
21. **B.E. Umirzakov, D.A. Tashmukhamedova, Y.S. Ergashov, A.K. Tashatov, N.M. Mustafoeva, Z.Z. Kamolov.** Parameters of energy bands and optical properties of MeSi₂/Si (111) nanosized structures.
22. **I.A. Zavidovskiy, O.A. Streletskiy, O.Yu. Nishchak, A.V. Pavlikov, N.F. Savchenko.** Ion assistance influence on the structure of a-C:Ag films deposited by pulse-plasma deposition technique.

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Section 5. Plasma-surface interaction – physics and technology

1. **U.S. Andropova, O.A. Serenko, V.N. Chernik, L.S. Novokov.** Investigation of polyimide composite resistance to the oxygen plasma flow.
2. **V.N. Arustamov, Kh.B. Ashurov, I.Kh. Khudakulov, B.R. Kakhramonov, A.M. Juravlev.** Ionization and recharge of ions in cathode spot of arc discharge in vacuum.
3. **V.N. Arustamov, Kh.B. Ashurov, I.Kh. Khudakulov, B.R. Kakhramonov, A.M. Juravlev.** Vacuum-arc treatment of construction material surface.
4. **V.N. Arustamov, Kh.B. Ashurov, I.Kh. Khudaykulov.** Analysis of vacuum arc anode spot formation and response of anode potential drop to plasma injection.
5. **P.Yu. Babenko, M.I. Mironov, V.S. Mikhailov, A.N. Zinoviev.** The first wall and divertor sputtering in the ITER.
6. **Kh.B. Ashurov, V.N. Arustamov, I.I. Khudaykulov, J.R. Ravshanov, D.T. Usmanov.** Formation of tungsten carbide nanoparticles during synthesis by plasmochemical method.
7. **N.A. Azarenkov, V.V. Bobkov, L.P. Tishchenko, Yu.I. Kovtunenkov, A.A. Skrypnik, and L.A. Gamayunova.** The influence of tungsten coatings temperature and dose of irradiation with He⁺ ions on helium accumulation.
8. **G.G. Bondarenko, V.I. Kristya, Myo Thi Ha, M.R. Fisher.** A model of the thermo-field electron emission from the cathode with a thin insulating film in glow discharge.
9. **A.S. Dvogyuk, V.I. Shymanski, V.M. Astashynski, A.M. Kuzmitski.** Phase composition of tungsten alloyed with copper by compression plasma flows impact.
10. **E.A. Grushevski, N.G. Savinski, V.I. Bachurin, L.A. Mazaletsky.** Formation of nanoscale matrices of anodized aluminum oxide using the method of electrolyte-plasma processing of materials.
11. **M. O. Izyumov.** Investigation of heat exchange of high-density low-pressure plasma with silicon wafers by laser interferometry.

12. **A.I. Kamardin, A.A.Simonov, B.D. Igamov, O.G. Pak.** Study of the conductivity of metal coatings deposition by thermal evaporation and magnetron recharge.
13. **V.O. Kuzmenko, A.V. Miakonkikh, S.N. Averkin, K.V. Rudenko.** Anisotropic etching of silicon in a cyclic process with oxygen passivation: optimization of selectivity.
14. **S.V. Nikolin, S.S. Volkov, B.V. Nasedkin, M.V. Chirkin.** Physical processes in an arc switching device with a moving bit channel.
15. **A.S. Rysbaev, M.T. Normuradov, I.R. Bekpulatov, I.Kh. Turapov, S.U. Irgashev, B.D. Igamov.** Formation of a Mn₄Si₇ film on a dielectric substrate by local laser transfer and annealing.
16. **D.N. Savelyev, E.A. Grushevski, N.G. Savinski, M. A. Smirnova, L.A. Mazaletsky, V.I. Bachurin, A.B. Churilov.** The investigation of electrophoretically deposited suspended graphene-based films by means of SEM, EDX/X-ray diffraction, and Raman spectroscopy measurements.
17. **A.V. Savitskaya, N.N. Bozko, F.A. Doronin, G.O. Rytikov, V.G. Nazarov.** Effect of plasma treatment on chemical composition, structure and functional properties of polymers.
18. **V.I. Shymanski, N.N. Cherenda, V.V. Uglov, V.M. Astashynski, A.M. Kuzmitski.** Ternary alloy Ti-Zr-Nb formation by means of high-energy compression plasma flows impact.
19. **A.A. Simonov, K.E. Vasilkovskiy, A.I. Kamardin, I.U. Kochemasov.** Study of the characteristics of corona discharge of point electrodes with various vacuum coatings.
20. **E.A. Smirnova, A.V. Miakonkikh, A.E. Rogozhin, K.V. Rudenko.** Physical properties of ruthenium films grown by atomic layer deposition.
21. **I.A. Sokolov, M.K. Skakov, A.Zh. Miniyazov, T.R. Tulenbergenov.** Research of beryllium stability under the conditions of operation of fusion installations.
22. **Yaoming Wang, Y.I. Tyurin, N.N. Nikitenkov, V.S. Sypchenko.** Luminescent methods for studying the interaction of atomic gases with ZnS-Mn²⁺.
23. **S.P. Zimin, I.I. Amirov, V.V. Naumov, Ya.D. Belov, E. Abramof, P.H.O. Rappl.** Ion-plasma modification of the surface of lead-tin telluride films at low ion energies.

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Section 6. Ion irradiation in biology and medicine.

1. **A.V. Agafonov, N.A. Sirotkin, A.V. Khlyustova, M.N. Shipko, M.A. Stepovich.** On the usage of low-temperature plasma in contact with a liquid for obtain nanostructured iron oxides.
2. **B.Sh. Kasimov, Sh.Dj. Akhunov, D.T. Usmanov.** Study of the additivity of mass spectra of stimulants in biofluids by the surface ionization method.
3. **F. Sanchez, L. Marot, R. Antunes, R. Steiner, M. Kisiel, E. Meyer, M. Astasov-Frauehoffer, I. Hauser-Gerspach, S. Köhl, J. Köser, R. Wagner, J. Hofstetter, K. Mukaddam.** Structuration of titanium surfaces using He ions.
4. **A.V. Stepanov, A.P. Popov, A.V. Kovalenko, A.I. Dimitrieva, D.S. Yumanov, A.A. Shemukhin, E.A. Vorobieva, A.P. Evseev.** Biointerfaces for intestinal microflora based on ion-modified carbon nanotubes.
5. **A.P. Evseev, E.A. Vorobyeva, Yu.V. Balakshin, A.V. Stepanov, D.K. Minnebaev, A.A. Shemukhin.** Influence of ion-induced defect formation in MWCNT on surface wettability.
6. **A.A. Shemukhin, E.N. Muratova, Yu.V. Balakshin, A.P. Evseev, D.K. Minnebaev, V.A. Moshnikov.** Localization of ionizing radiation using nanoporous alumina matrices.

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