POLYTECH
Peter the Great
St. Petersburg Polytechnic
University

Conference Program

XV International Conference «Physics of dielectrics» (Dielectrics–2020)

October 5-8, 2020

XV International Conference "Physics of Dielectrics"

October 5 – 8, 2020

The objective of the conference: exchange of research data and coordination of research between specialists in the field of Physics and Technology of dielectrics.

The main topics

Processes of charge transfer and accumulation in inorganic dielectrics	Electrophysics of polymer dielectrics and composites based on them
Dielectrics under extreme conditions	Physics of nanostructured dielectrics

The Physical Processes in Glassy Dielectrics

11.00	**Opening** Join in Zoom: https://us02web.zoom.us/j/5673452403?pwd=YU4xVVVYbGtDUlVzek5rZ1dZbHV0dz09 ID: 567 345 2403 Password: 678081
	welcoming speech by Director of Institute of Physics, Nanotechnology and Telecommunications of SPbPU, vice-chair of the Organizing Committee, **professor Vladimir Sorotsky**
	welcoming speech by President of Herzen State Pedagogical University of Russia, co-chair of the Organizing Committee, **Member of Russian Academia of Education Gennady Bordovsky**
	welcoming speech by President of MIREA — Russian Technological University, **Member of Russian Academia of Science Alexander Sigov**
	Plenary report
Chairs	**Alexander Sigov,** *professor, member of RAS, President of MIREA – Russian Technological University (Moscow)*
11.30	**Vladimir Gritsenko, leading researcher of Institute of Semiconductor Physics (Novosibirsk)** Charge Transport Mechanism in Stoichiometric and Non-stoichiometric Dielectric Films
12.00	**Galina Elyashevich, leading researcher of Institute of Macromolecular Compounds (St. Petersburg)** Polymer piezoelements based on polyvinylidene fluoride porous films
Session #5	**The Physical Processes in Glassy Dielectrics** Join in Zoom: https://us02web.zoom.us/j/5673452403?pwd=YU4xVVVYbGtDUlVzek5rZ1dZbHV0dz09 ID: 567 345 2403 Password: 678081

Chairs	**Alexander Kolobov,** *professor of Herzen State Pedagogical University of Russia (St. Petersburg)*
12.30	**The Influence of Iron on Structure and Electrical Properties of Sodium Borosilicate Glasses** Ewa Rysiakiewicz-Pasek[1], Agnieszka Ciżman[1], Marina Konon[2] and Tatiana Antropova[2] *[1]Wrocław University of Science and Technology, Wrocław, Poland* *[2]Grebenshchikov Institute of Silicate Chemistry, Russian Academy of Science, St. Petersburg, Russia*
12.45	**Antistructural Defects in a Glassy As_2Te_3** Gennady Bordovsky, Alla Marchenko, Aleksandr Luzhkov, Aleksandr Zharkoy and Pavel Seregin *Herzen State Pedagogical University of Russia, St. Petersburg, Russia*
13.00	**Dielectric Relaxation in the $GeSb_2Te_4$ Phase-Change Material** Aleksei Kononov[1], Yuta Saito[2], Paul Fons[2, 3], Junji Tominaga[2], Nadezhda Anisimova[1] and Alexander Kolobov[1, 2] *[1]Herzen State Pedagogical University of Russia, St. Petersburg, Russia* *[2]National Institute of Advanced Industrial Science & Technology, Ibaraki, Japan* *[3]Keio University, Yokohama, Japan*
13.15	**Antimony Concentration Effect on Luminescent Properties of Chromium-Doped Borate Glasses** Ekaterina Kulpina, Anastasiia Babkina and Kseniia Zyryanova *ITMO University, St. Petersburg, Russia*
13.30	**Research of Fatigue Damage in Organic Glass by Speckle Images** Vadim Davydov[1], Denis Nikolaev[1], Angelina Moroz[1], Galina Druzhinina[1], Diana Dmitrieva[2] and Valeria Pilipova[2] *[1]Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia*

	[2]*Bonch-Bruevich St. Petersburg State University of Telecommunications Nanotechnology and Telecommunications, St. Petersburg, Russia*
13.45	**Low-Frequency Dielectric Relaxation in Amorphous $MoTe_2$ Layers Obtained by RF Magnetron Sputtering** Rene Castro[1], Sergej Khachaturov[1], Aleksei Kononov[1], Yuta Saito[2], Paul Fons[2, 3], Nadezhda Anisimova[1] and Alexander Kolobov[1, 2] [1]*Herzen State Pedagogical University of Russia, St. Petersburg, Russia* [2]*National Institute of Advanced Industrial Science & Technology, Ibaraki, Japan* [3]*Keio University, Yokohama, Japan*
14.00	**Charge Transfer Hopping Mechanism in Thin Layers of Chalcogenide System $(As_2Se_3)_{100-x}Bi_x$** Gennadiy Bordovskii[1], Nadezhda Anisimova[1] and Gennady Grabko[2] [1]*Herzen State Pedagogical University of Russia, St. Petersburg, Russia* [2]*Transbaikal State University, Chita, Russia*
14.15	**About Concentration Profiles In Thermally Poled Glasses** Dmitrii Raskhodchikov[1, 2], Alexey Dergachev[3] and Andrey Lipovskii[1, 2] [1]*Alferov University, St. Petersburg, Russia* [2]*Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia* [3]*TESCAN Ltd Russia, St. Petersburg, Russia*
Session #3	**Dielectrics under extreme conditions** Join in Zoom: https://us02web.zoom.us/j/5673452403?pwd=YU4xVVVYbGtDUlVzek5rZ1dZbHV0dz09 ID: 567 345 2403 Password: 678081
Chairs	**Victoria Kapralova,** *associated professor of the Peter the Great St. Petersburg Polytechnic University (St. Petersburg)*

15.00	**Ferroelectric Capacitors under Extreme Load Conditions** Oleg Emelyanov and Andrey Plotnikov *Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia*
15.15	**Radio Pulse Generation at Electric Breakdown of Polypropylene Thin Film** Viktoria Kapralova[1], Vladimir Pakhotin[2] and Nicolay Sudar[1] *[1]Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia* *[2]Ioffe Institute, Russian Academy of Sciences, St. Petersburg, Russia*
15.30	**Polarization-Optical Tomography of Mechanical Stresses in Dielectric Cylindrical Structures of Hexagonal Single Crystal** Dmitriy Karov[1], Alfred Puro[2] and Anna Kuzmina[1] *[1]Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia* *[2]Euroakadeemia, Tallinn, Estonia*
15.45	**Study of Charge Processes in Gate Dielectrics of MOS Structures under Concurrent Influence of High-Field Tunnel Injection of Electrons and Ionization Radiation** Dmitrii Andreev[1], Vladimir Maslovsky[2], Vladimir Andreev[1] and Alexander Stolyarov[1] *[1]Bauman Moscow Technical University, the Kaluga branch, Kaluga, Russia* *[2]Moscow Institute of Physics and Technology (National Research University), Moscow region, Russia*
16.00	**The Influence of Ionizing Radiation Intensity on the Surface States in MOS-Structures** Oleg Aleksandrov *The St. Petersburg state electrotechnical university "LETI", St. Petersburg, Russia*
16.15	**Resonance Characteristics of Negative Ion Emission in the Rupture of Polymers**

	Vladimir Pakhotin[1], Viktoria Kapralova[2] and Nicolay Sudar[2] *[1]Ioffe Institute, Russian Academy of Sciences, St. Petersburg, Russia* *[2]Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia*
16.30	**Dielectric Spectroscopy of Frozen Dispersed Systems Based on Quartz** Aleksandr Volkov[1] and Gennadiy Koposov *[1]Northern (Arctic) Federal University named after M.V. Lomonosov, Arkhangelsk, Russia*
16.45	**Electrical Characteristics of Thin Zinc Tetraphenylporphyrin Films in Strong Electric Fields** Irina Zakharova[1], Marina Elistratova[2], Bolormaa Burentogtokh[1] and Valery Borodzulya[1] *[1]Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia* *[2]Ioffe Institute, Russian Academy of Sciences, St. Petersburg, Russia.*

Session #2 **Part 1**	**Electrophysics of polymer dielectrics and composites based on them** Join in Zoom: https://us02web.zoom.us/j/5673452403?pwd=YU4xVVVYbGtDUlVzek5rZ1dZbHV0dz09 ID: 567 345 2403 Password: 678081
Chairs	**Margarita Borisova,** *professor of the Peter the Great St. Petersburg Polytechnic University (St. Petersburg)*
11.00	**Piezoelectric Properties of the Oriented Porous Poly(vynilidene) Fluoride Films** Dmitrii Gerasimov[1], Ivan Kuryndin[2], Viktor Lavrentyev[2], Dmitry Temnov[3] and Galina Elyashevich[2] *[1]St. Petersburg State Institute of Technology (Technical University), St. Petersburg, Russia* *[2]Institute of Macromolecular Compounds, Russian Academy of Sciences, St. Petersburg, Russia* *[3]Herzen State Pedagogical University of Russia, St. Petersburg, Russia*
11.15	**Functional Composite Polymer Materials for Electrical Purpose** Ekaterina Tsobkallo[1], Olga Moskalyuk[1], Anna Stepashkina[2] and Vladimir Yudin[3] *[1]St. Petersburg State University of Industrial Technologies and Design, St. Petersburg, Russia* *[2]St. Petersburg State University of Aerospace Instrumentation, St. Petersburg, Russia* *[3]Institute of macromolecular compounds Russian academy of sciences, St. Petersburg, Russia*
11.30	**Study and Simulation of Heat Transfer in Nanostructured Polymer Dielectric Composites** Efrem Feklistov[1], Ekaterina Tsobkallo[1, 2], Olga Moskalyuk[2] and Anna Stepashkina[3] *[1]Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia*

	[2]St. Petersburg State University of Industrial Technologies and Design, St. Petersburg, Russia *[3]St. Petersburg State University of Aerospace Instrumentation, St. Petersburg, Russia*
11.45	**Effect of Stretching Rate on Charge Relaxation in PVDF Films** Yurij Gorokhovatsky[1], Anna Gulyakova[1], Yulia Sotova[1], Dmitry Temnov[1] and Vasilij Shabanov[2] *[1]Herzen State Pedagogical University of Russia, St. Petersburg, Russia* *[2]Concern "Oceanpribor", St. Petersburg, Russia*
12.00	**Electret State Influence of Polymer Fibrous Materials on Sorption of Petroleum Products** Victor Goldade *V.A. Belyi Metal-Polymer Research Institute of NAS of Belarus; Francisk Skorina Gomel State University, Gomel, Belarus*
12.15	**Formalized Modeling of Pyroelectric Coefficient Dependence on the Kinematic Viscosity During the First Order Phase Transitions in Oligodimethylsiloxanes** Nikolay Matveev, Viktor Saushkin, Natalya Evsikova, Nina Kamalova and Viktor Lisitsyn *Voronezh State University of Forestry and Technologies named after G. F. Morozov, Voronezh, Russia*
12.30	**Luminescence of Organic Sensitizing Dyes Adsorbed on Silver Stearate** Mikhail Goryaev and Alexander Smirnov *Herzen State Pedagogical University of Russia, St. Petersburg, Russia*
12.45	**Study of Electrophysical Properties of Electrical Insulating Paper Made of Low Polymerisation Degree Cellulose** Natalia Zhuravleva[1], Dmitry Kiesewetter[1], Alexandr Reznik[1], Ekaterina Smirnova[2], Albert Khripunov[3], Victor Malyugin[1], Nquyen Ngoc Tan[4] and Nquyen Tran An Tuan[4]

	[1]*Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia* [2]*State University of Industrial Technologies and Design, St. Petersburg, Russia* [3]*Institute of Macromolecular Compounds of Russian Academy of Science, St. Petersburg, Russia* [4]*Binh Duong University, Thu Dau Mot, Binh Duong, Vietnam*
13.00	**Features of Dielectric α-Relaxation Process in Thermoplastic Polyimides and Nanocomposites** Natalia Nikonorova[1], Daria Nazarova[2] and Rene Castro[2] [1]*Institute of Macromolecular Compounds Russian Academy of Science, St. Petersburg, Russia* [2]*Herzen State Pedagogical University of Russia, St. Petersburg, Russia*
13.15	**Composite Polyethylene with Diatomite as a Promising Material for Active Package** Nataliya Demidova and Dmitry Temnov *Herzen State Pedagogical University of Russia, St. Petersburg, Russia*
13.30	**Thermally Stimulated Short-Circuit Current Method and Features of Analyzing Methods on The Example Of EO-Polymers Based on PMMA-MAA and Porous PET Films** Natalia Shabanova, Yuri Gorokhovatsky and Elena Karulina *Herzen State Pedagogical University of Russia, St. Petersburg, Russia*
Session #2 Part 2	**Electrophysics of polymer dielectrics and composites based on them** Join in Zoom: https://us02web.zoom.us/j/5673452403?pwd=YU4xVVVYbGtDUlVzek5rZ1dZbHV0dz09 ID: 567 345 2403 Password: 678081

Chairs	**Ekaterina Tsobkallo,** *professor of St. Petersburg State University of Industrial Technologies and Design (St. Petersburg)*
14.00	**Influence of Manufacturing Techniques R-BAPB Polyimide Films on Charge Relaxation** Almaz Kamalov[1], Margarita Borisova[1], Andrey Didenko[2], Gleb Vaganov[2] and Vladimir Yudin[2] *[1]Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia* *[2]Institute of Macromolecular Compounds, Russian Academy of Sciences, St. Petersburg, Russia*
14.15	**Electric Modulus Spectroscopy of PA6/PA66 Aliphatic Polyamide** Vachagan Avanesyan and Zhanna Salnikova *Herzen State Pedagogical University of Russia, St. Petersburg, Russia*
14.30	**Dielectric Characteristics of Thermoplastic Polyimide R-BAPB in the Low Frequency** Margarita Borisova[1], Andrey Didenko[2], Benthara Mahasamilage Don Nilan Sankalapa Jayasinghe[1], Almaz Kamalov[1], Gleb Vaganov[2] and Vladimir Yudin[2] *[1]Peter the Great St. Petersburg Polytechnical University, St. Petersburg, Russia* *[2]Institute of Macromolecular Compounds of Russian Academy of Sciences, St. Petersburg, Russia*
14.45	**Change of Structure and Properties of Polymer Corona Electrets Due to Fine Fillers** Mansur Galikhanov *Kazan National Research Technological University, Kazan, Russia*
15.00	**The Study of Dipolar Relaxation in Chromophore-Containing Methacrylic Copolymers Using Thermally Stimulated Depolarization Current Measurements** Anvar Mukhtarov[1], Maksim Smirnov[2], Marina Balakina[1] and Tatyana Vakhonina[1] *[1]Arbuzov Institute of Organic and Physical Chemistry, FRC Kazan Scientific Center of RAS, Kazan, Russia*

	[2]*A N Tupolev Kazan National Research Technical University, Kazan, Russia*
15.15	**Derivation of the Havriliak – Negami Equation for the Complex Electrical Modulus** Zhanna Salnikova and Alexey Kononov *Herzen State Pedagogical University of Russia, St. Petersburg, Russia*
15.30	**Dielectric Spectroscopy of Blood Serum of Patients with Chronic Lymphocytic Leukemia** Zhanna Salnikova[1], Lyudmila Plotnikova[2], Alexander Smirnov[1], Andrey Garifullin[3], Andrey Kuvshinov[3], Sergey Voloshin[3, 4, 5] and Alexander Polyanichko[2, 6] [1]*Herzen State Pedagogical University of Russia, St. Petersburg, Russia* [2]*St. Petersburg State University, St. Petersburg, Russia* [3]*Russian Scientific Research Institute of Hematology and Transfusiology, St. Petersburg, Russia* [4]*Military Medical Academy named after SM Kirov, St. Petersburg, Russia* [5]*North-western State Medical University named after I.I.Mechnikov, St. Petersburg, Russia* [6]*Institute of Cytology of the Russian Academy of Sciences, St. Petersburg, Russia*
15.45	**Temperature Dependence of the Heat Capacity of Polymer Compositions with Metal Oxide Fillers** Abdusalom Umarov[1] and Khaqberdi Khamzaev [1]*Tashkent State Transport University, Tashkent, Uzbekistan* [2]*Jizzakh State Pedagogical Institute, Jizzakh, Uzbekistan*
16.00	**Investigation of Ultrafine Expansion in Epr Studies of a Polymer Composition Based on Polystyrene** Abdusalom Umarov[1] and Dilnavoz Kamalova[2] [1]*Tashkent State Transport University, Tashkent, Uzbekistan* [2]*Navoi State Pedagogical Institute, Navoi, Uzbekistan*

Session #1	**Processes of charge transfer and accumulation in inorganic dielectrics** Join in Zoom: https://us02web.zoom.us/j/5673452403?pwd=YU4xVVVYbGtDUlVzek5rZ1dZbHV0dz09 ID: 567 345 2403 Password: 678081
Chairs	**Sergey Nemov,** *professor of the Peter the Great St. Petersburg Polytechnic University (St. Petersburg)*
11.00	**Studies of the Distribution of Relaxators in Proustite Crystals at High Frequencies** Aleksander Ilinskiy[1], Iulia Gendina[2], Marina Pashkevich[3], Irina Popova[2] and Eugeniy Shadrin[1] *[1]Ioffe Institute, Russian Academy of Sciences, St. Petersburg, Russia* *[2]Herzen State Pedagogical University of Russia, St. Petersburg, Russia* *[3]Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia*
11.15	**Controlling Anisotropy of Multilayered Graphenes for Usage in Charge Storage Devices** Kirill Levine[1], Rojerio Jelamo[2], Vyacheslav Doronin[1], Irina Sapurina[3], Samuil Khanin[1] and Mikhail Kampan[4] *[1]Telecommunication academy named after S.M. Budienny, St. Petersburg, Russia* *[2]Federal University of Triangulo Mineiro - UFTM, Institute of Technological and Exact Sciences, Uberaba, Brazil* *[3]Institute of Macromolecular Compounds, Russian Academy of Sciences, St. Petersburg, Russia* *[4]Ioffe Institute, Russian Academy of Sciences, St. Petersburg, Russia*
11.30	**Optical Properties of Undoped Oxygen-Containing Compounds of $Gd_3Al_2Ga_3O_{12}$ and $Gd_3Al_3Ga_2O_{12}$ Single-Crystals**

	Valentina Kasimova[1], Nina Kozlova[1], Oleg Buzanov[2] and Evgeniya Zabelina[1] *[1]Laboratory "Single crystals and stock on their base", National University of Science and Technology MISIS, Moscow, Russia* *[2]JSC "Fomos-Materials", Moscow, Russia*
11.45	**The Action of an Electric Field on the Aluminum Hydride Decomposition** Mikhail Goryaev *Herzen State Pedagogical University of Russia, St. Petersburg, Russia*
12.00	**Features of Applying the Power-Law Function to the Analysis of the Frequency Dependences of the Conductivity of Disordered Semiconductors** Mikhail Ormont *Moscow State University, Moscow, Russia*
12.15	**$(Pb_zSn_{1-z})_{1-x}In_xTe$ Compounds: Superconductor-Insulator State Transition** Nikolay Mikhailin[1], Sergei Nemov[2], Robert Parfeniev[1] and Dmitri Shamshur[1] *[1]Ioffe Institute, Russian Academy of Sciences, St. Petersburg, Russia* *[2]Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia*
Session #4	**Physics of nanostructured dielectrics** Join in Zoom: https://us02web.zoom.us/j/5673452403?pwd=YU4xVVVYbGtDUlVzek5rZ1dZbHV0dz09 ID: 567 345 2403 Password: 678081
Chairs	**Rene Castro,** *professor of Herzen State Pedagogical University of Russia (St. Petersburg)*
12.45	**Dielectric Spectroscopy and Semiconductor–Metal Phase Transition in VO_2:W Films** Aleksandr Ilinskiy[1], Rene Castro[2], Lidiia Smirnova[2], Vladimir Klimov[1], Marina Pashkevich[3] and Evgeniy Shadrin[1]

	[1]*Ioffe Institute, Russian Academy of Sciences, St. Petersburg, Russia* [2]*Herzen State Pedagogical University of Russia, St. Petersburg, Russia* [3]*Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia*
13.00	**Formation of Fresnoite Nanostructures in SiO_2 Porous Glasses** Jose Angel Roldan Lopez[1, 2], Luis Manuel Angelats Silva[1, 2], Henry Leon-Leon[1], Miguel Valverde-Alva[2], Leonid Korotkov[3], Ewa Rysiakiewicz-Pasek[4] and Nikita Emelianov[5] [1]*Antenor Orrego Private University, Trujillo, Peru* [2]*National University of Trujillo,Trujillo, Peru* [3]*Voronezh State Technical University, Voronezh, Russia* [4]*Wroclaw University of Science and Technology, Wrocław, Poland* [5]*Kursk State University, Kursk, Russia*
13.15	**Mechanical Properties of Nanoporous Organo Silicate Glass Films for the Use in Integrated Circuits Interconnects** Ivan Ovchinnikov, Georgiy Orlov, Dmitriy Seregin, Alexey Vishnevskiy, Konstantin Vorotilov and Alexandr Sigov *MIREA – Russian Technological University (RTU MIREA), Moscow, Russia*
13.30	**Spectral and Luminescent Characteristics of $La_{1-x}Pr_xGa_5Sb_{1.5}O_6$, $Bi_{1-x}Pr_xGe_{0.5}Sb_{1.5}O_6$ (x = 0 - 0.5) Solid Solutions** Anna Egorysheva[1], Olga Gajtko[1], Svetlana Golodukhina[1], Svetlana Khrushchalina[2], Polina Ryabochkina[2], Alina Taratynova[2] and Ivan Yurlov[2] [1]*Kurnakov Institute of General and Inorganic Chemistry, Russian Academy of Sciences, Moscow, Russia* [2]*National Research Mordovia State University, Saransk, Russia*

13.45	**Spectral Dependence of Photocurrent of UV Sensor Based on In-Zn Oxide Nanofibers** Nadezhda Markova, Vitaliy Pikulev, Olga Berezina, Aleksandr Pergament and Elena Kolobova *Petrozavodsk State University, Petrozavodsk, Russia*
14.00	**Effect of High-Temperature Annealing on Photoluminescent Properties of Anodic Alumina** Nikolai Mukhurov, Irina Gasenkova, Sergei Zhvavyi, Eduard Kolesnik and Irina Andrukhovich *State Research and Production Association "Optic, Optoelectronic and Laser techniques", Minsk, Belarus*
14.15	**Insulator–Metal Transition in Vanadium Dioxide Nanofibers** Olga Berezina, Nadezhda Markova, Aleksandr Pergament, Anton Alekseev and Andrey Sharlaev *Petrozavodsk State University, Petrozavodsk, Russia*
14.30	**Topological Insulator's State in Bismuth Thin Films** Evgenii Demidov, Vasilisa Gerega, Vladimir Grabov, Vladimir Komarov and Anton Suslov *Herzen State Pedagogical University of Russia, St. Petersburg, Russia*
14.45	**Mechanism of the Autowave Process in a Thin Layer of Colloidal Solution of Magnetic Nanoparticles in Liquid Dielectric** Vladimir Chekanov[1, 2] and Elena Diskaeva[2] [1]*North-Caucasus Federal University, Stavropol, Russian Federation* [2]*MIREA-Russian Technological University, Stavropol, Russian Federation*
15.00	**Conference closing**
Chairs	**Yuriy Gorokhovatsky,** *professor of the Herzen State Pedagogical University of Russia (St. Petersburg)*
	Short report by Session Chairs