IV International Conference on Ultrafast Optical Science (UltrafastLight-2020)

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IV International Conference on Ultrafast Optical Science (UltrafastLight-2020) was held on September 28-October 02, 2020 in P.N. Lebedev Physical Institute (LPI) in Moscow, Russia. The mixed (offline and online) Conference format was chosen due to the current quarantine measures and travel restrictions, nonetheless it did not affect the highest quality of the talks given by all the speakers registered at the Conference. The possibility of broadcasting through Zoom drastically increased the number of reports made by foreign participants which enabled more detailed outlook of the present problems and development of the optical science field. IV International Conference on Ultrafast Optical Science aimed at experience exchange between scientists and researchers from different countries and united the specialists presenting even different continents. Succession ensurance and its maintenance being the sufficient part of our mission was reflected in practice by inviting not only scientists, but also students specialized in optics and laser physics.

The Conference was represented by a large number of sessions covering various topics in modern physics of ultrafast optical phenomena and their applications in technology, medicine, production, research in other fields of science. Six main topics (sections) were presented, including Extreme light, Ultrafast phenomena in condensed matter and ionized gases, Ultrafast laser nanofabrication and nanophotonics, Femtosecond non-linear optics and filamentation, Frequency combs in spectroscopy and optical clocks, Physics and technology of ultrafast lasers and ultrashort laser pulses. The unusual event format enabled participants not only to unite within the sections, but also to attend the speeches of colleagues from related fields, exchange ideas, establish new business contacts, find new tasks and expand the horizons of their research thanks to the emerging collaborations.

The Conference traditionally consisted of plenary sessions, oral reports, flash talks and a poster session, which allowed not only world famous scientists, but also young professionals and students to take part in the event. The following time frame was set for reports: plenary presentation duration 35 min plus 5 min for questions, invited presentation 25 min total, oral presentation 15 min total, flash talk 5 min. The possibility of discussing the presentation not only after the speech itself, but also during it (using text messages in the chat) radically changed the format of the Conference, allowing expanding the boundaries of the usual "question-answer" to discussions involving a large number of participants simultaneously.

The main aim of the Conference is to unite specialists from all over the world, which has been successfully implemented for the fourth time. The Conference in LPI in Moscow has been held annually...
since 2017, attracting various information resources, scientific journals and publishers, technology companies as sponsors and participants in addition to the speakers.

The organizing and scientific committee of the IV International Conference on Ultrafast Optical Science (UltrafastLight-2020) expresses gratitude to all participants for their invaluable contribution to the event, for their willingness to share knowledge, for taking part in such an unusual format despite all the difficulties and even different time zones. We hope that this volume of JPCS will contribute in the scientific knowledge development and will be of interest to both specialists and students who are just taking their first steps in science.

Scientific Program Committee

Nikolay Kolachevsky (chair), Prof., The Corresponding Members of the RAS, LPI director
Andrey Ionin (vice-chair), Prof., head of Division of Quantum Radiophysics, LPI
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Conference Sections

Section 1. Extreme light
Section 2. Ultrafast phenomena in condensed matter and ionized gases
Section 3. Ultrafast laser nanofabrication and nanophotonics
Section 4. Femtosecond non-linear optics. Filamentation. High field THz generation.
Section 5. Frequency combs in spectroscopy and optical clocks
Section 6. Physics and technology of ultrafast lasers and ultrashort laser pulses
Plenary Speakers

Vladimir Belotelov, M.V. Lomonosov Moscow State University, Russia
Sergey Makarov, ITMO University, Russia
Ya Cheng, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China
Harald Giessen, 4th Physics Institute and Research Center, University of Stuttgart, Germany
Vladimir Tikhonchuk, Centre Lasers Intenses et Applications, University of Bordeaux, CNRS, CEA, France
Andrei Kabashin, Aix Marseille Univ, CNRS, France
Stefan Maier, Nanoinstitute Munich, LMU Munich
Jean Claude Kieffer, L'Institut national de la recherche scientifique, Canada
Miguel Alonso, The Institute of Optics, University of Rochester, US
Natalia Litchinitser, Duke University, US
Alexander Kolobov, Herzen State Pedagogical University of Russia, Russia

Invited Speakers

Vyacheslav Morozov (International Laser Center and Physics Faculty of M.V.Lomonosov Moscow State University, Russia)
Sergei Nikitin (OOO "FentoVision" Russian Quantum Center Group, Russia)
Alexey Andrianov (Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia)
Pavel Kostryukov (P.N. Lebedev Physical Institute of RAS, Russia)
Olga Kosareva (Lomonosov Moscow State University, Russia)
Arnaud Couairon (École Polytechnique, France)
Gattamraju Ravindra Kumar (Tata Institute of Fundamental Research, India)
Aurelien Houard (École Polytechnique, France)
Stelios Tzortzakis (Foundation for Research and Technology - Hellas, Greece)
Ladan Arissian (University of New Mexico)
Eduardo Oliva (Instituto de Fusión Nuclear "Guillermo Velarde" Universidad Politécnica de Madrid, Spain)
Olga Rosmej (Helmholtzzentrum für Schwerionenforschung GSI Darmstadt, Germany)
Nikolay Andreev (Joint Institute for High Temperatures of the Russian Academy of Sciences, Russia)
Konstantin Lotov (Budker INP, Russia)
Sergey Stremoukhov (National Research Centre “Kurchatov Institute”, Russia)
Vladimir Antonov (Institute of Applied Physics of the Russian Academy of Sciences, Russia)
Nadezhdta Bulgakova (HiLASE Centre, Institute of Physics AS CR, Prague)
Martynas Beresna (Optoelectronics Research Centre, University of Southampton, UK)
Razvan Stoian (CNRS - Université de Lyon, France)
George Tsibidis (IESL-FORTH, Greece)
David Grojo (CNRS, Aix-Marseille University, LP3 laboratory, France)
Emmanuel Haro Poniatowski (Departamento de Fisica, Universidad Autónoma Metropolitana Iztapalapa, México)
Ivan Pavlichenko (University of Nizhny Novgorod Institute of Applied Physics RAS, Russia)
Alexander Pukhov (Heinrich Heine University of Dusseldorf, Germany)
Sergey Rykovnov (Skolkovo Institute of Science and Technology, Russia)
Masakatsu Murakami (Institute of Laser Engineering, Osaka University, Japan)
Sergey Pikuz (Joint Institute for High Temperatures RAS, Russia)
Konstantin Ivanov (Physics faculty of M.V. Lomonosov MSU, Russia)
Andrey Stepanov (Institute of applied Physics, Russia)
Eric Suraud (University Paul Sabatier, Toulouse, France)
Evgeny Gurevich (Laser Center (LFM) FH-Muenster, Germany)
Thibault Derrien (HiLASE Centre, Institute of Physics, Czech Academy of Sciences, Czech Republic)
Andrei Savel'ev (Lomonosov Moscow State University, Russia)
Vasily Kostin (University of Nizhny Novgorod, Russia)
Alexander Popov (Physics faculty of M.V. Lomonosov MSU, Russia)
Ihar Babushkin (Institute of Quantum Optics, University of Hannover, Germany)
André Mysyrowicz (École Polytechnique, France)
Maksim Melnik (ITMO University, St. Petersburg, Russia)
Andrey Brantov (P.N. Lebedev Physical Institute of RAS, Russia)
Victor Kulagin (Sternberg Astronomical Institute of Lomonosov Moscow State University, Moscow, Russia)
Alexander Fedotov (National Research University MEPhI, Russia)
Evgeny Gelfer (ELI Beamlines, Czech Republic)
Sven Reichenberger (University of Duisburg-Essen, Germany)
Sergey Kudryashov (P.N. Lebedev Physical Institute of RAS, Russia)
Stanislav Zabotnov (Lomonosov Moscow State University, Faculty of Physics, Moscow, Russia)
Leonid Zhigilei (University of Virginia, USA)
David Amans (Université de Lyon, Université Claude Bernard Lyon 1, France)
Katharine Moore Tibbets (Virginia Commonwealth University, USA)
Martin Garcia (University of Kassel, Germany)
Ivan Oladyshkin (Institute of Applied Physics of the Russian Academy of Sciences, Russia)
Irina Balakireva (Russian Metrological Institute of Technical Physics and Radio Engineering, Russia)
Piotr Masłowski (Institute of Physics, Nicolaus Copernicus University in Toruń, Poland)
Dmitry Skryabin (University of Bath, UK)
Anton Afanasiev (Institute of Spectroscopy RAS, Russia)
Mikhail Gubin (P.N. Lebedev Physical Institute of RAS, Russia)
Takashi Omatu (Chiba University, Japan)
Yoshiki Nakata (Osaka University, Japan)
Aleksandr Kuchmizhak (Institute of Automation and Control Processes, Far Eastern Branch, Russian Academy, Russia)
Alexey Porfirov (Image Processing Systems Institute of RAS – Branch of the FSRC “Crystallography and Photonics” RAS, Russia)
Oleg Vitrik (Institute for Automation and Control Processes FEB RA, Russia)
Tatiana Itina (Jean Monnet University, Univ. Lyon, France)
Dmitrii Pushkarev (P.N. Lebedev Physical Institute of RAS, Russia)
Ludwig Maximilians (University of Munich, Munich, Germany; Department of Physics, Imperial College London, London, UK)

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Fig. 1 Poster session (top). Extreme Light session (bottom).