15th International Conference “Gas Discharge Plasmas and Their Applications”

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Abstract. This paper is a preface to the proceedings of the 15th International Conference “Gas Discharge Plasmas and Their Applications”, which was held in Ekaterinburg, Russian Federation on September 5 to 10, 2021.

1. Introduction

The 15th International Conference “Gas Discharge Plasmas and Their Applications” (GDP-2021) took place (in-person) in Ekaterinburg, Russian Federation on September 5 to 10, 2021 [1].

The Conference is a significant scientific event that has been held in Russia since 1982. Initially, it arose as an all-union meeting on physics of electrical breakdown in gases, which acquired the status of an international conference since 2007. Traditionally, the Conference is held every two years in various cities of Russia: Makhachkala, Omsk, Ryazan, Kazan, Novosibirsk, Samara, etc. This year, Ekaterinburg was chosen as the venue for the first time in the long history of the event.

2. Conference location

The Conference was held in Ekaterinburg, located in the heart of the Urals on the border of Europe and Asia. Oral sessions took place in the center of the city at the World Trade Center's conference hall “Panorama” (Ekaterinburg, Kuibysheva st., 44D). Poster reports were presented at the Institute of Electrophysics of the Ural Branch of the Russian Academy of Sciences (Ekaterinburg, Amundsena st., 106). Along with the poster session, participants could take part in an excursion to the laboratories of the Institute.

It is very important that this time the Conference was managed by the Institute of Electrophysics of the Ural Branch of the Russian Academy of Sciences, which celebrates the 35th anniversary of its founding this year. The Institute was organized back in 1986 by a group of scientists under academician G A Mesyats leadership. Then, despite the difficult conditions, the novel investigations were immediately started as well as the previous works were continued in the unprecedented for the Ural region field – a powerful impulse technique. The Institute of Electrophysics was and remains not only a regional and national, but also a world scientific leader in the areas of its research.

3. Organizers

The organizers of the Conference are as follows:

- Institute of Electrophysics, Ural Branch of RAS (main organizer);
These organizations have quite a long experience of cooperation in the field of scientific research, educational activities and management. In addition, research in the scientific fields presented at the conference is being conducted in all of these organizations. This Conference is a real example of the integration of academic and university science.

4. Organization

4.1. General Chairmen of the Conference
- Gennady Mesyats

4.2. Organizing Committee Chairman
- Stanislav Chaikovsky

4.3. Program Committee
- Nikolay Zubarev (Chairman)
- Yuri Korolev (Co-Chairman)
- Nikolay Gavrilov (Co-Chairman)
- Igor Beketov
- Grey Boltachev
- Igor Filatov
- Boris Gelchinski
- Alexander Kamenetskikh
- Elena Kokorina
- Vasily Lisenkov
- Vladimir Ovchinnikov
- Sergei Rukin
- Alexander Safronov
- Igor Uimanov

4.4. Local Organizing Committee
- Anton Kaygorodov (Chairman)
- Yuliya Bryukhanova
- Alexander Chepusov
- Alexander Dyadkov
- Olga Kaygorodova
- Efrem Makarov
- Anna Makarova
- Yuri Mamontov
- Andrey Menshakov
- Nikita Pavlov
- Nikita Pavzderin
- Maksim Pedos
- Ivan Punanov
4.5. Advisory Committee

- Alexander Akimov, Budker Institute of Nuclear Physics SB RAS, Russia
- Yury Akishev, Troitsk Institute for Innovation & Fusion Research, Russia
- Sergey Barengolts, P.N. Lebedev Physics Institute RAS, Russia
- Alexander Batrakov, Institute of High Current Electronics SB RAS, Russia
- Massimiliano Bestetti, Politecnico di Milano, Italy
- Peitian Cong, The Northwest Institute of Nuclear Technology, China
- Victor Ivanov, Moscow Institute of Physics and Technology, Russia
- Vladimir Ivanov, Ural Federal University, Russia
- Weihua Jiang, Extreme Energy-Density Research Institute, Japan
- Nail Kashapov, Kazan Federal University, Russia
- Nikolai Koval, Institute of High Current Electronics SB RAS, Russia
- Andrey Kozyrev, National research Tomsk State University, Russia
- Yakov Krasik, Israel Institute of Technology “Technion”, Israel
- Valery Krivobokov, National Research Tomsk Polytechnic University, Russia
- Alexey Makarov, Ural Branch of RAS, Russia
- John Mankowski, Texas Tech University, USA
- Alexey Markov, Tomsk Scientific Center SB RAS, Russia
- Nikolay Mushnikov, M.N. Mikheev Institute of Metal Physics UB RAS, Russia
- Bucur Novac, Loughborough University, UK
- Efim Oks, Tomsk State University of Control Systems and Radioelectronics, Russia
- Vladimir Oreshkin, Institute of High Current Electronics SB RAS, Russia
- Viktor Papan'nyi, Irkutsk State University, Russia
- Laurent Pecastaing, Université de Pau et des Pays de l’Adour, France
- Nikolay Ratakhin, Institute of High Current Electronics SB RAS, Russia
- Luis Redondo, Lisbon Engineer Superior Institute, Portugal
- Gennady Remnev, National Research Tomsk Polytechnic University, Russia
- Andrey Rempel, Institute of Metallurgy UB RAS, Russia
- Vladimir Rogalin, Institute for Electrophysics & Electric Power RAS, Russia
- Ilya Romanchenko, Institute of High Current Electronics SB RAS, Russia
- Alexander Schwock, BalticNet-PlasmaTec, Germany
- Tao Shao, Institute of Electrical Engineering, China
- Alexander Semenov, Institute of Physical Materials Science SB RAS, Russia
- Oleg Volokitin, Tomsk State University of Architecture and Building, Russia
- Xinxin Wang, Tsinghua University, China
- Michael Yalandin, Institute of Electrophysics UB RAS, Russia
- Vladimir Yamschikov, Institute of Electrophysics and Electric Power RAS, Russia
- Hanwu Yang, National University of Defense Technology, China
- Zicheng Zhang, National University of Defense Technology, China

5. Topics
The scientific program of the conference consists of four main topics, which determined its division into four sections:

- Fundamental processes in low-temperature plasma: low and high pressure discharges, near-electrode phenomena, radiation, ultrafast processes, diagnostics (Section 1).
- Gas-discharge methods for surface modification and coating deposition: surface modification, ion implantation, combined methods of surface treatment (Section 2).
- Plasma-chemical, electrophysical and laser technologies: environmental applications, production of nanopowders and functional materials (Section 3).
- Sources of low-temperature plasma: generators of continuous, pulse-periodic and pulsed action, gas switches, power supply (Section 4).

Like any communication platform, the Conference initiates discussions on topics of interest to participants. As a result, participants have the opportunity to identify state-of-the-art in resolving issues raised in the framework of the conference, as well as to determine the prospects for the development of areas related to the conference topics.

6. Participants
270 people were pre-registered as participants of the conference. They submitted 236 abstracts which were published in [2].

The total number of participants was 175: 155 of them were present on-site (see figure 1) and 20 on-line. Participants represent 9 counties: Azerbaijan – 2, Belarus – 2, China – 7, France – 1, Israel – 1, Italy – 1, Japan – 1, Kazakhstan – 4 and Russia – 156. Distribution by cities: Ekaterinburg – 78, Tomsk – 40, Moscow – 17, Novosibirsk, Beijing, Ufa – by 4, another 22 cities – by 1 or 2 participants.

![Figure 1. Participants of the GDP-2021 conference.](image)

7. Scientific program and Conference proceedings
The conference program consisted of 7 Plenary and Invited Lectures, 72 Invited Reports and Oral Presentations, and 96 Poster Presentations. 140 articles have been sent to Organizing Committee; 135 articles have been accepted for publication in Journal of Physics: Conference Series. The Conference proceedings were edited by Nikolay Zubarev, Vasily Lisenkov, Alexandre Kamenetskikh, Igor Filatov, Sergei Rukin and Grey Boltachev (Institute of Electrophysics UB RAS).

8. Young scientist competition
38 young scientists took part in Young Scientist Competition in both Oral and Poster sessions. Each scientist was evaluated by 3-4 referees. 4 best presentations have been chosen to be awarded by diplomas and prizes. Prizes went to:
Acknowledgments
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[1] URL https://gdp2021.uran.ru
[2] Zubarev N M (ed) 2021 Book of Abstracts of the 15th International conference “Gas discharge plasmas and their applications” (Ekaterinburg: IEP UB RAS)