XXXV International Conference on Equations of State for Matter

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Abstract. This paper is a preface to the proceedings of the XXXV International Conference on Equations of State for Matter, which was held at the Cheget pension in the village of Terskol, in the settlement of Elbrus, in the Kabardino-Balkar Republic of the Russian Federation, from March 1 to 6, 2020.

1. Introduction
The XXXV International Conference on Equations of State for Matter (ELBRUS 2020) was held at the Cheget pension located on Polyana Cheget in the village of Terskol, in the settlement of Elbrus, in the Kabardino-Balkar Republic of the Russian Federation, from Sunday, March 1, to Friday, March 6, 2020 [1].

2. Conference location
The Cheget pension in Terskol is 5 km from Mount Elbrus (the highest peak of the Caucasus at 5642 m), about 120 km from Nalchik, which is the capital of the Kabardino-Balkar Republic, where the nearest international airport is located, and about 180 km from Mineralnye Vody, where there is another international airport.

The village of Terskol is located in the valley of the Baksan River, which begins on Mount Elbrus. It is a famous ski resort at altitude of about 2000 m. This valley is in a national park, which is a region of extreme natural beauty. Visit to Mount Elbrus is possible by cable car for seeing the Greater Caucasus range with permanent snow from the Old Krugozor (3000 m), Mir (3500 m) and Gara-Bashi (3780 m) stations.

3. Founders
- Joint Institute for High Temperatures (JIHT) RAS, Moscow, Russia;
- Institute of Problems of Chemical Physics (IPCP) RAS, Chernogolovka, Russia;
- Kabardino-Balkarian State University (KBSU), Nalchik, Russia.
4. **Sponsor**
- Russian Academy of Sciences (RAS).

5. **Organization**

5.1. **Chairmen**
- Vladimir E Fortov† (JIHT RAS, Moscow, Russia);
- Barasbi S Karamurzov (KBSU, Nalchik, Russia).

5.2. **Vice-Chairmen**
- Konstantin V Khishchenko (JIHT RAS, Moscow, Russia);
- Valery G Sultanov (IPCP RAS, Chernogolovka, Russia).

5.3. **Secretary**
- Maxim A Kadatskiy (JIHT RAS, Moscow, Russia).

5.4. **Organizing committee**
- Sergey Garanin (Russian Federal Nuclear Center—All-Russian Scientific Research Institute of Experimental Physics [RFNC-VNIIEF], Sarov, Russia);
- Alexander A Golubev (Institute for Theoretical and Experimental Physics named by A. I. Alikhanov of National Research Centre “Kurchatov Institute”, Moscow, Russia);
- Radii I Ilkaev (RFNC-VNIIEF, Sarov, Russia);
- Dieter H H Hoffmann (Xi’an Jiaotong University, Xi’an, China);
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- Pavel R Levashov (JIHT RAS, Moscow, Russia);
- Alexander A Lutovinov (Space Research Institute RAS [IKI], Moscow, Russia);
- Alexander E Mayer (Chelyabinsk State University [CSU], Chelyabinsk, Russia);
- Anatoly L Mikhailov (RFNC-VNIIEF, Sarov, Russia);
- Mikhail A Mochalov (RFNC-VNIIEF, Sarov, Russia);
- Vladimir V Molkov (University of Ulster, Northern Ireland, UK);
- Genri Norman (National Research University Higher School of Economics, Moscow, Russia);
- Yuri A Olenin (ROSATOM, Moscow, Russia);
- Dmitry V Petrov (Russian Federal Nuclear Center—Academician Zababakhin All-Russian Scientific Research Institute of Technical Physics [RFNC-VNIITF], Snezhinsk, Russia);
- Oleg F Petrov (JIHT RAS, Moscow, Russia);
- Sergey V Razorenov (IPCP RAS, Chernogolovka, Russia);
- Gerd Röpke (University of Rostock, Rostock, Germany);
- Georgy N Rykovanov (RFNC-VNIITF, Snezhinsk, Russia);
- Alexey P Savinsev (KBSU, Nalchik, Russia);
- Boris Yu Sharkov (Joint Institute for Nuclear Research, Dubna, Russia);

† 23 January 1946 to 29 November 2020.
• Eduard E Son (JIHT RAS, Moscow, Russia);
• Vladimir V Stegailov (JIHT RAS, Moscow, Russia);
• Lev M Zeleny (IKI, Moscow, Russia);
• Marvin A Zocher (Los Alamos National Laboratory, Los Alamos, NM, USA).

5.5. **Website coordinator**
• Maxim A Kadatskiy (JIHT RAS, Moscow, Russia).

5.6. **Program committee**
• Konstantin V Khishchenko (JIHT RAS, Moscow, Russia);
• Maxim A Kadatskiy (JIHT RAS, Moscow, Russia);
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• Pavel R Levashev (JIHT RAS, Moscow, Russia);
• Denis V Shakhray (IPCP RAS, Chernogolovka, Russia);
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• Nikolay E Andreev (JIHT RAS, Moscow, Russia);
• Vladimir P Efremov (JIHT RAS, Moscow, Russia);
• Victor B Mintsev (IPCP RAS, Chernogolovka, Russia);
• Vladimir V Stegailov (JIHT RAS, Moscow, Russia);
• Valery G Sultanov (IPCP RAS, Chernogolovka, Russia);
• Eduard E Son (JIHT RAS, Moscow, Russia);
• Igor L Iosilevskiy (JIHT RAS, Moscow, Russia);
• Lev G D’yachkov (JIHT RAS, Moscow, Russia).

5.7. **Organizers**
• Elena S Khromova (Research Consulting Center “FORUM-SM”, Chernogolovka, Russia);
• Galina Yu Vorob’eva (Research Consulting Center “FORUM-SM”, Chernogolovka, Russia).

6. **Topics**
• Equations of state and constitutive equations for matter under extreme conditions at high pressures and temperatures;
• Shock waves, detonation and combustion physics;
• Interaction of intense laser, x-ray and microwave radiation with matter;
• Interaction of powerful particle beams with matter;
• Experimental techniques of generation and diagnostics of extreme states of matter;
• Methods of mathematical modeling in physics of extreme states of matter;
• High-energy astrophysics;
• Low-temperature plasma physics;
• Issues of physics and power engineering, technology aspects.
7. Participants
364 people were pre-registered as participants of the conference. They submitted 306 abstracts with results of works of 751 co-authors from 121 institutions from 15 countries (Argentina, Australia, Belarus, the People’s Republic of China, the Czech Republic, France, Germany, Italy, Japan, Poland, Russia, Turkey, Ukraine, the United Kingdom, the United States of America). 201 participants attended the sessions from different cities of Russia (figure 1).

8. Scientific program
The conference program consisted of 5 plenary, 66 regular oral and 235 poster presentations.

8.1. Plenary
During the first four days of the conference sessions, the plenary talks were given by five invited speakers:

- Vladimir Evgenyevich Fortov (JIHT RAS, Moscow, Russia) “\( T = (Z^2 e^2 / \varepsilon T) n_e^{1/3} \)”; 
- Mochalov Mikhail Alekseevich (RFNC-VNIIEF, Sarov, Russia) “Strong shock waves and extreme states of plasma obtained in the Russian Federal Nuclear Center—VNIIEF in experiments at pressures up to 20 TPa”; 
- Veiko Vadim Pavlovich (ITMO University, Saint-Petersburg, Russia) “Compressed laser-induced microplasma as an effective tool for transparent materials processing”; 
- Inogamov Nail Alimovich (ITP RAS, Chernogolovka, Russia) “Laser technologies: From physics of ablation to surface nanostructuring and to synthesis of colloids”;

Figure 1. Participants of the ELBRUS 2020 conference.
• Byalko Alexey Vladimirovich (ITP RAS, Chernogolovka, Russia) “Fate of fragments of the Moon formation during the giant impact”.

8.2. Oral sessions
There were 53 regular talks presented during 5 consecutive sessions:

• Equations of State for Matter;
• Shock Waves, Detonation and Combustion;
• Power Interaction with Matter;
• Methods of Mathematical Modeling;
• Physics of Low Temperature Plasma.

8.3. Poster session
All posters were presented during two poster sessions on March 2 and 3, 2020.

9. Best poster awards
A contest for the best poster was held among the participants. Prizes went to five:

• Arseniy Burov (JIHT RAS, Moscow, Russia) “Ab initio study of MgO under pressure using quasiharmonic approximation”;
• Ekaterina Godina (Institute for Electrophysics and Electrical Power RAS, Saint-Petersburg, Russia) “Arc pyrolysis of methane in the presence of oxygen”;
• Alina Kirillova (Saint-Petersburg State Technological Institute [Technical University], Saint-Petersburg, Russia) “Investigation of wood ash melting by ac plasma torch”;
• Anastasia Igorevna Krikunova (Moscow Institute of Physics and Technology, Dolgoprudny, Russia) “Flames under the reducing gravity”;
• Alexandra Igorevna Khirianova (Lebedev Physical Institute RAS, Moscow, Russia) “The simultaneous use of interferometry and schlieren photography in laser diagnostics of plasma objects”.

10. Prospects
The next meeting in the series is the XXXVI International Conference on Interaction of Intense Energy Fluxes with Matter, 1–6 March 2021, Elbrus, Kabardino-Balkaria, Russia [3].

Acknowledgments
We thank all the conference participants and authors of the materials, as well as all the organizers of the conference. We are especially grateful to E S Khromova and G Yu Vorobyeva for technical assistance and Yu K Khishchenko for developing conference symbols. We appreciate deeply A P Savintsev for the local organizing efforts.

We are very thankful to G E Norman, P R Levashov, N A Inogamov, V P Veiko, N E Andreev, V V Stegailov, L G D’yachkov and B B Zeleny for chairing the sessions.

We appreciate greatly I Alikhanov, S Yu Ananev, E M Apfelbaum, S I Ashitkov, A A Baldin, R S Belikov, V R Bilyak, A Yu Dolgoborodov, V S Dozhidikov, L G Dyachkov, N A Inogamov, V A Khokhlov, N D Kondratyuk, A V Konyukhov, O N Koroleva, V S Krasnikov, A I Krikunova, Yu K Kurilenkov, P R Levashov, E A Lisin, A E Mayer, D V Minakov, I V Morozov, D N Nikolaev, A V Oginov, M E Pinchuk, S I Popel, M E Povarnitsyn, N P Satonkina, A Ye Shapiyeva, A P Shevelko, E L Spirina, V A Sirot, D S Sitnikov, A M Tereza, S A Trigger, A V Utkin, I A Valuev, L M Vasilyak, M S Vlaskin and V S Vorob’ev for reviewing the articles.

We also thank P A Pankratov for providing us with a photograph for this preface.
[1] URL http://www.ihed.ras.ru/elbrus20
[2] Fortov V E et al (eds) 2020 Book of Abstracts of the XXXV Int. Conf. on Equations of State for Matter URL http://www.ihed.ras.ru/elbrus20/abstracts/ELBRUS2020_book_of_abstracts.pdf
[3] URL http://www.ihed.ras.ru/elbrus21