

Preface

In the first two decades of the 21st century, the world witnessed the emergence of large ground-based telescopes and space projects and the rapid improvement of astronomical instrumentation, electromagnetic emission receivers, information and telecommunication technologies. Astronomical research in Russia has progressed not only toward integration with the world community but also aimed at the development of scientific equipment and methods of observation with Russian instruments ensuring the preservation, demand, and improvement of Russian telescopes, the largest of which are: the optical BTA and the RATAN-600 radio telescope. The Special Astrophysical Observatory of the Russian Academy of Sciences (SAO RAS), which manages these instruments, carries out research on a wide range of tasks in modern astrophysics observing celestial objects (from the bodies of the Solar system to distant galaxies) including those in the interests of astronomical institutions in Russia and in the world. It was the initial aim of the observatory to open its instruments for the entire astronomical community and to select observation programs on a competitive basis that played a major role in possessing the status of SAO RAS as the largest center of the ground-based astronomy in Russia.

In 2020 in the village of Nizhny Arkhyz, the Special Astrophysical Observatory of RAS organized the All-Russian Scientific Conference “Ground-Based Astronomy in Russia. 21st Century” which discussed the current state of the ground-based astronomy in Russia and the prospects for its development in the next decade. It was dedicated to the memory of Yuri Nikolaevich Gnedin and Dmitry Alexandrovich Varshalovich, who made great contribution to the development of astronomy in Russia. The report by the Full Member of RAS A. M. Cherepashchuk in the Proceedings is devoted to Yu. N. Gnedin and D. A. Varshalovich.

The conference was held at SAO RAS from September 21 to 25, 2020. It was conducted with the personal attendance of the participants taking into account the limitations caused by the epidemic situation. The organizers provided the opportunity for some speakers to talk remotely also.

The conference was attended by about 200 people, among them were the Full Members of RAS: Yu. Yu. Balega, R. A. Sunyaev, and A. M. Cherepashchuk, the Corresponding Members of RAS: D. V. Bisikalo, Yu. Yu. Kovalev, A. V. Stepanov, B. M. Shustov, the directors of almost all astronomical institutions in Russia: Director of the Crimean Astrophysical Observatory of RAS A. N. Rostopchina-Shakhovskaya, Director of INASAN D. V. Bisikalo, Director of SAI MSU K. A. Postnov, Director of GAO RAS N. R. Ikhsanov, Director of SAO RAS V. V. Vlasyuk, heads of departments of the Kazan and Southern Federal Universities: I. F. Bikmaev and I. A. Acharova. The conference was attended by the representatives of the St. Petersburg State and Ural Federal Universities and academic institutions: the Space Research Institute (Moscow), the Institute of Applied Astronomy (Saint Petersburg), the Ioffe Physical-Technical Institute (Saint Petersburg), the Institute of Applied Physics (Nizhny Novgorod), the Baksan Neutrino Observatory and others, our partners from the LLC “Promgeodesia”, as well as astronomers, engineers, and graduate students of the Special Astrophysical Observatory of RAS.

The conference presented 110 oral and 70 poster presentations. The reports of particular interest were presented by Yu. Yu. Balega “Strategy for the development of astronomy in Russia in the next decade”, B. M. Shustov “On the support of space missions by ground-based telescopes: the Spectrum-UV project”, and R. A. Sunyaev “SRG Orbital Observatory: results of the first all-sky survey in the X-ray and long-term observations during the “Functional Checks” of the SRG/eROSITA telescope. The role of ground-based optical support.”

In the conclusion of the conference it was noted:

1. The conference was successful despite the difficult external circumstances caused by the coronavirus pandemic.
2. The ground-based astronomy in Russia is developing, and there is certain success achieved. Interesting results have been reported at the conference. They have been already obtained using new, recently put into operation ground-based and space instruments (for example, at the SRG space observatory and at the Caucasian Mountain Observatory of SAI MSU); test observations began at the new fiber-optic spectrograph of the BTA.
3. However, the general gap with the advanced (world) level continues. An example is the absence of telescopes in the millimeter and submillimeter ranges in Russia and the unclear prospects in this direction.

The conference participants decided:

1. To support the opinion stated in the report of the Vice-President of the Russian Academy of Sciences Yu. Yu. Balega on the absolute requirement to develop a high-level program (Federal Research and Development Program—FRDP) for the development of astronomy in Russia; expressed their readiness to participate in the early development of such a program.
2. To draw attention to the need of taking high-priority measures to eliminate Russia’s obvious gap in the field of creating the means of the millimeter and submillimeter astronomy.
3. To express gratitude to the conference organizers for providing the conditions for successful holding this important event.

These Proceedings contain the invited, oral, and poster presentations provided by the participants.

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The Editors

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