

# Contribution of the student conferences “Physics of Space” to the continuing astronomy education system

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**Abstract.** Ural Federal University is one of the main and most effective centers for educating young astronomers in Russia. The traditional student scientific conferences “Physics of Space” have been successfully held annually in Kourovka Astronomical Observatory of the Ural Federal University for 50 years and have gained recognition not only in Russia. The conference initiated many educational initiatives both in the Ural region and, in general, in Russia. The astronomy education system implemented by UrFU and partners includes the following activities: 1) education and career guidance of schoolchildren in the Lyceum of UrFU, 2) activities to attract applicants, 3) training at the speciality, undergraduate, and graduate level, 4) participation in the student conferences “Physics of Space”, 5) postgraduate studies, 6) cooperation in the field of education. This activity ensures the attraction of promising youth to scientific research.

**Keywords.** continuing astronomy education system, student conferences

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## 1. Introduction

Ural Federal University (UrFU) is one of the main and most effective centers for educating young astronomers in Russia. The traditional student scientific conferences “Physics of Space” have been successfully held annually in Kourovka Astronomical Observatory (KAO) of UrFU for 50 years and have gained recognition not only in Russia. Every winter, at the end of January, 40–50 students from Russia and 15–25 graduate students and young scientists from universities and academic astronomical organizations gather here. Foreign participants, as a rule, are fluent in Russian. The conference initiated many educational initiatives and, what is essential, allows them to maintain a high scientific and educational level. The astronomy education system implemented by UrFU and partners

includes the following activities: 1) education and career guidance of schoolchildren in the Lyceum of UrFU, 2) activities to attract applicants, 3) training at the speciality, undergraduate, and graduate level, 4) participation in the student scientific conferences “Physics of Space”, 5) postgraduate studies, 6) cooperation in the field of education.

## 2. Astronomy education system activities

1) *Education and career guidance of schoolchildren in the Lyceum of UrFU.* Special program for the graduates of Lyceum annually provides 4–6 graduates which enter UrFU and other universities that teach specialists in astronomy.

2) *Activities to attract applicants.* The thematic lecture hall on astronomy, implemented in KAO for schoolchildren of Yekaterinburg and Ural region and accompanied by excursions to the telescopes of the observatory, significantly expand the base of potential applicants for the speciality “Astronomy”.

3) *Training at the speciality, undergraduate, and graduate level.* The UrFU has implemented training in the speciality “Astronomy” based on the best world experience. The programs are aimed at training specialists in digital technology in space sciences and big data mining. Practices in KAO and leading astronomical institutions are aimed at developing skills and experience in astronomy using various instruments.

4) *The student conferences “Physics of Space”* (<https://astro.insma.urfu.ru/school>). Conferences provide an opportunity to train skills, take part in the competition of scientific reports, get acquainted with leading scientists, and form cooperations for scientific work (Sobolev *et al.* 2003). Review lectures have been published since 1997. Conference site contains archive of review lectures and abstracts of the student and young scientist talks starting from 2002 (<https://astro.insma.urfu.ru/school/archive>). Starting from 2018 these publications became refereed, contain abstracts in English and have DOI numbers. Student conferences are a catalyst for how scientists of the future are formed from the students interacting with scientists of reknown.

5) *Postgraduate studies.* The contacts established at the conferences “Physics of Space” increase research efficiency by forming teams of researchers from potential graduate students and their leaders. Graduate students of UrFU, Institute of Astronomy of the Russian Academy of Sciences (INASAN), St. Petersburg University (more than 20 people) participate in joint projects of Russian and international research groups.

6) *Cooperation in the field of education.* The interaction of universities and scientific institutions during the organization and research, internships for students and graduate students provides access to modern equipment of the Terskol Observatory of INASAN, KAO UrFU, SAO RAS, Moscow State University and world facilities of the common use. Joint research involving students and graduate students in promising projects is crucial in the success of cooperation between research groups from various organizations.

## 3. Conclusions

Conferences “Physics of Space” play a significant role in the continuing astronomy education system, combining education and scientific research. At these conferences, employees of leading astronomical institutions in Russia and abroad present review lectures, students and graduate students test their work, and research groups are formed for new projects. Young scientists have the opportunity to get involved in the work of leading research groups, and the leaders of these groups participate in the preparation and selection of the most promising students and graduate students. Each year 30–40 people

take part in this process as young researchers, ensuring involvement of the promising young people in the Russian scientific community.

### **Reference**

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