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SLOVAK ACADEMY OF SCIENCES

PROCEEDINGS OF THE CONFERENCE  
**VII BREDIKHIN CONFERENCE**

May 24 – 28, 2021, Zavolzhsk, Russia

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# PROCEEDINGS OF THE CONFERENCE

Edited by:

Mikhail Sachkov & Anna Kartashova

## VII BREDIKHIN CONFERENCE

May 24 – 28, 2021, Zavolzhsk, Russia

Institute of Astronomy Russian Academy of Sciences, Moscow, Russia  
Zavolzhsk Municipal Museum , Zavolzhsk, Russia

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## PREFACE

A series of conferences dedicated to the latest achievements in the theory of comets and the dynamics of small bodies of the solar system called "Bredikhin Readings" was organized by the Russian Academy of Sciences (until 1991 of the USSR Academy of Sciences). The conferences are named after the great Russian astronomer Fedor Bredikhin, director of the Moscow Observatory, director of the Pulkovo Observatory, who made a decisive contribution to the development of comet and meteor research. Initially, it was planned that the conference would take place every three years and be held in places associated with Bredikhin. The first conference was held in 1983 in Zavolzhsk, Ivanovo region, Russia. There, until 1917 it was named the Kineshma district of Kostroma province, there was a manor "Pogost" (Churchyard), in which the scientist conducted his astronomical observations, where he made his most significant discoveries, a place that were visited by the scientific elite of pre-revolutionary Russia. Here (now - on the territory of the city of Zavolzhsk, Ivanovo region) is the family tomb of the Bredikhins - a monument of federal significance. The second Bredikhin readings were held in 1986 in Nikolaev (Ukraine), the place where the scientist was born. The third readings were held in 1989 at the Pulkovo Observatory, the director of which was Bredikhin. The fourth readings were held in 1992 in the city of Zavolzhsk. Further, for 22 years, the "Bredikhin readings" were not held. In 2014, on the initiative and with the support of the administration of Zavolzhsk and the Russian Academy of Sciences, it was decided to resume this conference. In 2014, the "V Bredikhin Conference" were successfully held. According to the results of the conference, it was decided to hold "Bredikhin conference" regularly in the city of Zavolzhsk. In May 2021, the VII Bredikhin conference were held.

The conference was held in three sections: "Comets", "Meteoroids, meteors, meteorites", "History of cometary astronomy". This collection includes original works written based on materials that were presented at the VII Bredikhin conference.

The most important contribution to the development of cometary astronomy was the results of the ROSETTA space mission. According to modern ideas, comets have retained the primary matter in their composition, so their study is of crucial importance for understanding the processes of formation of the Solar System. Many problems of determining the chemical composition of comets and studying the physical processes in their nuclei and comas can be solved exclusively using ultraviolet data, at the same time, a number of tasks require supplementing UV data with data obtained from ground-based telescopes. Due to the opacity of the earth's atmosphere for UV radiation, obtaining data in the UV region of electromagnetic radiation is possible only using methods of extra-atmospheric astronomy. UV data is particularly important, because it is in the UV part of the spectrum that most of the astrophysical significant resonance lines of atoms (OI, CI, HI, etc.), molecules (CO, CO<sub>2</sub>, OH, etc.), and their ions are located. In recent years, interesting results have been obtained from



monitoring high-resolution spectra in the region of CaII lines in gas disks around selected stars, which is explained by cometary activity around these stars. We assume that UV observations will also be effective in exometrical studies. A number of works presented in this collection are devoted to the upcoming World Space Observatory Ultraviolet project. This is one of the main projects of the Federal Space Program of Russia of fundamental space research. The project is to replace the Hubble Space Telescope in orbit. The equipment of the project should be ready in 2025. Most of the scientific research program is occupied by exoplanetary research. A number of articles in this special issue are also devoted to them. Meteor studies are important for understanding the processes of formation and evolution of the Solar System. The works of this collection are also devoted to this scientific problem.

I am pleased to acknowledge all who have contributed to the success of the conference. I thank for finance support the Administration of Zavolzhsk town. I am grateful to my fellow SOC members for valuable suggestions on invited speakers, assistance with putting together the scientific program. Special thanks to the Local Organizing Committee for conceiving the conference and managing all of its logistical aspects. We thank all participants for making this conference memorable and scientifically rewarding. I would like to express my special gratitude to the staff of the Zavolzhsk Municipal Museum and personally to the director Svetlana Kasatkina for her help in organizing the conference

Mikhail Sachkov, SOC Chair

Moscow, November 2021