

Astronomical and geophysical meteor observations: past, present, future

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Technological innovations and other achievements of the beginning of the XXI century have already provided new opportunities for the entire astronomical science in general and meteor astronomy in particular. Progress in modern meteor science closely interacts with the general progress of international organized science. Behind many important and striking discoveries of modern astronomy are large international research projects and large international organizations (United Nations Office for Outer Space Affairs (UNOOSA), Committee on Space Research (COSPAR), International Astronomical Union (IAU), International Union of Geodesy and Geophysics (IUGG) and International Union of Radio Science (URSI) etc.). We emphasize, first of all, an important contribution to the development of the meteor science by the International Astronomical Union. The object of the study are meteors, meteoroids, geophysical and astronomical conditions in the Earth's atmosphere and in open space. The goal is to show, from a historical perspective, the interconnection, interaction and complementarity of geophysical and astronomical meteor studies. The strategic plan for the development and application of astronomy for 2020-2030 established by the International Astronomical Union and is easily accessible for study on the website of the IAU (WEB IAU Strategic Plan 2019). The plan has five objectives: 1) worldwide coordination of astronomy and the promotion of communication and the dissemination of astronomical knowledge among professional astronomers; 2) the inclusive advancement of the field of astronomy in each country; 3) the use of astronomy as a tool for development in each country; 4) public involvement in astronomy through access to astronomical information and science messages of astronomy; 5) encouraging the use of astronomy for teaching and education at the school level. Each task has detailed tasks and actions to accomplish it, the celebration of the 100th anniversary of the international astronomical union in 2019 is an obvious simultaneous holiday for meteoric astronomy as well, and the goals in the field of astronomy outlined by the international astronomical association will undoubtedly be taken into account by the commission of the International Astronomical Union "Meteors, Meteorites and Interplanetary Dust" and the entire scientific community of meteor researchers in their plans for the development of meteor astronomy in the future. And, of course, interdisciplinary research is in the field of priority research. We immediately emphasize the interdisciplinary nature of the meteor phenomenon in the Earth's atmosphere, which is associated both with geophysics and astronomy. The development of meteor astronomy and the monitoring of its events take place under the management of Commission F1 "Meteors, Meteorites and Interplanetary Dust" of Division F of the International Astronomical Union "Planetary Systems and Bioastronomy."

The International Geophysical Year 1957 program conducted in 1957-1958 was the first successful global project of joint astronomical and geophysical studies of solar-terrestrial relations. The fifth section of this program had the name "Ionosphere. Meteors". At the same time, as part of the program, the world's first space explorations were planned through launches of artificial Earth satellites. The space age was opened and with it a new direction of meteor research appeared, connected with the meteoroid danger for spacecraft and direct research in space. This project was associated with SCOSTEP (Scientific Committee on Solar-Terrestrial Physics). Today, more than ten years after the program "The International Heliophysical Year 2007" (Kolomiyets&Slipchenko 2007), the term "space weather" is relevant, which expanded the field of studying solar influence to the borders of the Heliosphere. Examples of interdisciplinary research tools include such meteor radar systems: in the past - "MARS" (Meteor Radar Automatic System, Ukraine (Kolomiyets 2012)), and now -SAAMER (The Southern Argentina Agile Meteor Radar, Argentina (Janches et. al. 2015)). The report positions the relationship of astronomical and geophysical research in future methods and techniques.

References

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