

30 years of the Moscow-Minneapolis collaboration in space physics

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For the past 30 years, I used to spend several months in Minnesota, at Augsburg University, almost every year (with the exception of periods of political complications). This small private university, across the Mississippi river from the University of Minnesota, houses the Center for Space and Atmospheric Physics, led by Prof. Mark Engebretson. As typical for U.S. research centers, most of the group and students are supported by “soft money” from grants from the National Science Foundation. The main direction of work is the deployment and support of continuous operation of a network of highly sensitive magnetometers for recording Ultra-Low-Frequency waves (frequencies from several mHz to several Hz) at high latitudes: in Arctic Canada, Antarctica, and Greenland. ULF waves are the image of magnetohydrodynamic waves in the near-Earth space, penetrating to the earth's surface. The deployed network of magnetometers provides ground support for measurements carried out simultaneously on satellites in the magnetosphere and ionosphere. The goal of these studies is to understand the physical mechanisms of the generation and propagation of ULF waves, and on this basis to develop ground-based diagnostics of plasma processes in the near-Earth media.

The Laboratory of Physics of the Near-Earth Space at the Institute of Physics of the Earth (Russian Academy of Sciences), which I am now leading, is working in the same direction. Naturally, having somehow met with prof. M. Engebretson at a conference, we have decided to do something together. At the first stage, the visits of the Moscow staff were supported by Supplements for International Collaboration for ongoing NSF grants. During the collapse of the USSR, when the country happened to be in the hands of marauders, these were the money that enabled the laboratory to survive. Then, upon submitting new proposals to the NSF, V. Pilipenko was included in the collaborators, which made it possible for Augsburg University to pay him salary as a visiting professor. Apparently, a small part of NSF funds, which ultimately went to support the laboratory in Moscow, turned out to be the most effective investment of American taxpayers' funds in scientific research. Within the framework of several grants, 75 articles have been published in Q1-Q2 journals, in addition to countless papers at conferences.

Based on this experience of scientific cooperation between scientists from the USA and the Russian Academy of Sciences, in my report I will try to draw some conclusions and generalizations.