

Introduction by the authors

Russia launched the first Earth satellite in 1957 and the first scientific laboratory into Earth orbit the following year – Sputnik 3. Most accounts of Russian and Soviet space achievements have, understandably, focused on manned spaceflight, the cosmonauts, the rockets, the politics, and the engineering achievements of the Russian and Soviet space programs. There has not yet been an examination of what Russian space science has actually achieved in building our knowledge of the space environment and the solar system. This is a largely untold story. During the days of the space race, the scientific outcomes of Soviet space missions were not well known and reached only eminent scientists at international gatherings of their peers. In the English-language-speaking world, media coverage of Russian scientific discoveries was limited, some was even dismissive (and, in the Cold War period, suspicious), and the Soviet Union lacked the channels like *National Geographic Magazine* to communicate its message. Their leading scientists were little known.

As we will see, these discoveries were substantial. This book attempts to build a comprehensive picture of the record and story of Russian space science, before, during, and after the Soviet period. It focuses not just on the higher-profile missions to Mars, Venus, and the Moon, but on a broad range of missions from astrophysics to the ionosphere, from solar studies to the plasmasphere. The questions we attempt to answer are: *What scientific missions were undertaken? How? Why? What instruments were used? What was learned? What discoveries were made? Where were the greatest gains in our knowledge? How important was science within the Soviet and Russian space program? Who were the key personalities? What were the principal decisions and priorities?*

Defining what is and what is not “space science” is not as straightforward as it may first appear, especially in the area of space-based applications looking back towards Earth. Here, we have generally excluded the use of space-based instruments to map the Earth and its ground features, as well as other applications of spaceflight, such as communications and navigation. This book includes space-based research to improve our knowledge of the relationship between our atmosphere, water, and land, as well as space biology and the analysis of substances in microgravity in Earth orbit. This book covers not only unmanned robotic probes, but scientific work

undertaken on board orbital space stations, such as Salyut, Almaz, Mir, and the International Space Station.

Although the Soviet Union and Russia have engaged in many international collaborative missions, especially around the space station Mir, the focus here will be on Soviet/Russian space science, rather than on international equipment carried on Russian satellites and space stations. Where international equipment was used as an integral part of Russian space science projects, it is, of course, very much included.

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2010

Russian Space Probes
Scientific Discoveries and Future Missions
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2011, XXIX, 514 p., Softcover
ISBN: 978-1-4419-8149-3
A product of Praxis