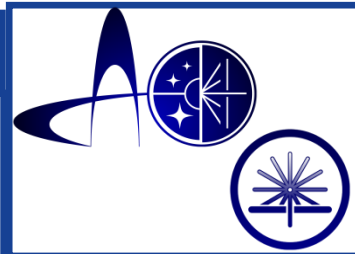


The Special Astrophysical Observatory of the RAS - RATAN-600

The Special Astrophysical Observatory of the Russian Academy of Sciences (SAO RAS) was founded in 1966 as an open access center. It is the largest Russian astronomical center for ground-based observations of objects in the Universe. One of the main instruments of the observatory is the RATAN-600 radio telescope with a 600 m multi-element ring antenna. RATAN-600 has a status of open access instrument and it is registered in the scientific and technological infrastructure of the Russian Federation. The observational time is provided free of charge on the competitive basis only (via Russian Telescope Time Allocation Committee).

RATAN-600 is the large multifrequency instrument with possibility to measure instantaneous radio spectrum at the frequencies of 1-30 GHz. This advantage allows to solve a wide range of astrophysical tasks, space weather forecasting and multichannel astronomy goals. The main areas of observatory research are:

- the cosmic objects of different nature: stars and planets, the protoplanet systems, the Sun and the Solar system objects, pulsars, the Galaxy, galaxies and other extragalactic objects, background radiation of the Universe and an interstellar medium;
- the near-Earth environment and the atmospheric studies;
- implementation and development of the newest observational methods, the telescope modernization, the information support of the astronomical research.



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Instruments:

Domain and object of research : PSE

RATAN-600

A radio telescope with variable profile ring antenna 600 m in diameter. The focus and the form of the main mirror are changed during the observations. Such antenna was created for achieving a large geometric area and a high angular resolution. Due to its wide free-aberration zone the telescope can get instantaneous radio spectra of objects in the frequency range 1-30 GHz during 2-3 min without significant losses of a signal with the transverse removal of a primary feeds. The following methods are realized with the RATAN-600: the measurements spectral flux densities in the frequency range 1-30 GHz for the cosmic objects, the measurements of the radio emission intensity and polarization at 3-18 GHz for Sun and discreet radio sources; the measurements spectral flux density at the frequency 5 GHz with a high time resolution.

The following RATAN-600 methods are used:

1. The cosmic radio sources flux density measurement in frequency range 1.3-22.3 GHz (continuum).
2. The cosmic radio sources flux density measurement in frequency range 4.8-22.3 GHz (continuum).
3. Measurement of discrete radio sources and Sun radio emission (intensity and polarization) in a dynamic range up to 60 dB at the frequencies 3-18 GHz.
4. Measurement the Sun radio emission (intensity and polarization) with frequency resolution up to 1% in the frequency range 0.75-18 GHz.
5. Measurement of the spectral flux density of radio sources in the frequency range 4.4-5.0 GHz with a high temporal resolution 60 μ s (continuum).