Spectrum-RG

Spectrum-RG is joint project of Russian Federal Space Agency (Roscosmos) and German Space Agency (DLR) of X-ray astrophysical observatory. Its main aim is to make all-sky survey in the X-ray (0.5–11 keV) band in order to find all massive clusters of galaxies in the Universe, millions of active galactic nuclei, including obscured ones and hundreds of thousands of Galactic X-ray sources. This information is crucial to understand the nature of dark energy and the role, which dark matter played in the evolution of the Universe, namely, in formation of its large-scale structure. In addition to the all-sky survey, dedicated sky regions will be observed with higher sensitivity and follow-on pointed observations of selected sources at energies up to 30 keV thereafter.

Two scientific instruments will be installed onboard the spacecraft:

- *eRosita* (Germany) X-ray grazing-incident mirror telescope, consisting of 432 mirrors combined in 7 modules. Energy band 0.3–10 keV. The telescope is developed by Max-Planck Institute for Extraterrestrial Physics.

- ART-XC (Russia) X-ray mirror telescope, consisting of 7 modules with 7 mirror shells. Energy band 6–30 keV. The telescope is developed by IKI, All-Russian Institute for Experimental Physics (VNIIEF, Sarov), with the contribution from NASA's Marshall Space Flight Center (the USA).

Scientific payload is housed on *Navigator* bus, developed by Lavochkin Association (Russia). Spectrum-RG will be launched on *Zenit* launcher and delivered to Lagrange point L2 at the distance of 1.5 million km from the Earth on the Sun-Earth line outside Earth's orbit.

Total mass of the spacecraft — ~2200 kg. Anticipated launch date — 2017. Observational program will last for 7 years, the first four of which will be devoted to the all-sky survey, and the rest of the mission nominal lifetime will be spent on follow-on pointed observations of the most interesting sources.

Main scientific objectives of the survey mode

The major scientific goals of the SRG mission all-sky survey are:

- to study large-scale structure of the Universe and to measure the Dark Energy equation of state;

- to study the process of growth and cosmological evolution of supermassive black holes in the Universe;

- to search for the rarest and exotic objects in the Universe.

Further Information

Project's official web page http://hea.iki.rssi.ru/SRG/en/index.php
eRosita's official web page, Max-Planck's Institute for Extraterrestrial Physics
http://www.mpe.mpg.de/eROSITA

[ИЛЛЮСТРАЦИИ]
<SRG_illustration> Spectrum-RG. Artist's view (c) IKI
<SRG_mirrors_marshall> One of the mirror systems for ART-XC (c) IKI
<SRG_detectors> Assemling the electronics unit for ART-XC detectors (c) IKI