

PROTOCOL

on the Conditions of Cooperation in the Framework of the SRG Project

This Protocol is linked to the **Amendment to the Agreement on the establishment of a 1.5-m optical telescope facility in Turkey signed on March 21, 1995** between The Space Research Institute, Kazan Federal University and The Scientific and Technological Research Council of Turkey signed on December, 22 2014.

The protocol defines the conditions of cooperation in the framework of the SRG project, including the description of tasks to be performed, equipment to be delivered, the data sharing procedure, and financial and legal issues, including procedures in the case of force majeure.

1. **ART-XC X-ray data sharing procedure.** After the successful launch of the SRG space observatory, IKI will provide to TUBITAK the coordinates and X-ray data of 2% (minimum 200) of all newly discovered ART-XC sources, and TUBITAK will obtain the rights to investigate these sources independently, without the participation of IKI or KFU. In addition, the coordinates and X-ray data for another 2% (minimum 200) X-ray sources discovered by ART-XC will be provided to TUBITAK for joint analysis by Russian and Turkish scientists. The principal investigators of such joint projects will be split equally between both sides (half Turkish and half Russian). IKI will provide the safe and timely flow of the X-ray data required for optical identification and other scientific investigation of these X-ray sources to TUBITAK. The exact definitions of the ART-XC survey, new ART-XC sources and ART-XC data associated with this Protocol, the procedure and timing of data delivery of these X-ray data, the proprietary period, and other relevant terms, are provided in **Appendix** to this document, which is an essential part of this Protocol.
2. Turkish scientists will have the right to use the coordinates of a source allocated to the Turkish side and associated X-ray data for observations with RTT150 and other ground and space based telescopes. In the case that collaboration with other scientific groups is desired, the Turkish side will first propose collaboration to IKI and KFU.
3. An additional opportunity of collaboration is foreseen for very bright X-ray sources among the ART-XC sources provided to TUBITAK. If the Turkish side considers some of these sources interesting for detailed spectral analysis of ART-

XC X-ray data, TUBITAK should inform the Russian side about such interest and the Russian side will then invite Turkish scientists to IKI to participate in the analysis of the relevant X-ray data together with their Russian colleagues. The total number of such ART-XC sources must not exceed 5.

4. **Publication policy.** Any publications on ART-XC sources, analyzed by Turkish scientists and analyzed by Russian and Turkish scientists jointly, will be coordinated between the Russian and Turkish sides in order to enhance the scientific return of the SRG mission. By coordination it is understood as to just inform the Russian side about the research work done on the sources allocated to TUBITAK, and by any means it does not mean to interfere with the publication of the research work.
5. IKI will keep TUBITAK up-to-date on the scientific and technical status of the SRG mission and the ART-XC telescope.
6. **RTT150 telescope operation.** Since RTT150 remains a property of the Russian Federation (KFU), its engineering support will remain a responsibility of the Russian side. However, the Turkish side will make all reasonable efforts to support the efforts of the Russian side to maintain the proper operation of the RTT150 telescope. Any operations made by the Turkish and/or Russian side that can affect the quality of the telescope or of the optical data obtained with it, must be explicitly agreed upon by both sides. The engineering support of the TFOSC spectrograph and camera will remain a responsibility of the Turkish side. On their part, the Russian side will make all reasonable efforts to support the efforts of the Turkish side to maintain the proper operation of the TFOSC spectrograph and camera
7. **Force majeure.** Special rules will be defined or the whole agreement will be revised in the following cases:
 - if the SRG space observatory has not been launched or the first 6-month period of the SRG all-sky X-ray survey has not been completed within 3 years after the start of the transition period mentioned in the **Amendment** to the **Agreement**;
 - if after the launch of the SRG space observatory the whole SRG mission or either of the two telescopes aboard SRG (eROSITA or ART-XC) fail to operate;
 - if the observational program of the SRG observatory, for any reason, proves to

be significantly different from the planned mission;

- if, for any reason, the (minimum required) 200 ART-XC sources to be delivered to the Turkish side amount to more than 10% of the whole sample of new X-ray sources detected by ART-XC;
- if, for any reason, the RTT150 telescope or the TFOSC spectrometer and camera (the main focal instrument to be used for follow-up observations of SRG X-ray sources) fail to operate.

All these cases will be considered force majeure. At force majeure conditions, the current **Amendment to the Agreement on the establishment of a 1.5-m optical telescope facility in Turkey** and also this **Protocol** will be regarded as invalid anymore. In this case, all involved and interested parties will discuss a new **Amendment** to the existing **Agreement** or a new **Agreement** in order to regulate the same issues under new conditions. Presently, neither side can take any obligations for the case of force majeure.

8. Any other issues that may arise should be resolved within the frame of the **Agreement, Amendment to the Agreement** and this **Protocol** and laws of the two respective countries.

Appendix to Protocol

on the Conditions of Cooperation in the Framework of the SRG Project, agreed between IKI RAN, KFU and TUG

The ART-XC survey will presumably consist of 8 half-a-year scans of the entire sky (i.e., 4 years in total) at the beginning of the SRG mission and subsequent 3 years of pointed observations of selected targets (mostly new sources discovered during the scanning phase). It should be noted however that the durations of the scanning and pointing phases may be redefined by the SRG Steering Committee prior to or during the SRG mission. The procedure of delivering the data for new ART-XC sources to the Turkish side, outlined below, attempts to minimize the effects of possible modifications in the strategy of the SRG mission.

The sky region associated with the agreement with TUBITAK, hereafter the TUBITAK sky region, is the part of the sky defined by the superposition of the following conditions:

- Galactic longitude $l > 0$, in order to avoid possible conflicts of interests for sources detected by the eROSITA telescope aboard SRG in the German hemisphere ($l < 0$) of the eROSITA survey;
- Excluding the region with a diameter of 16 deg around the Northern Ecliptic Pole – NEP (RA = 18 00 00, Dec = 66 33 38.5), because the data rights for ART-XC sources in that region of the sky lie with Russian and US scientists according to the agreement with NASA in return for the US contribution to the ART-XC hardware (production and calibration of three flight and one spare mirror systems);
- Excluding the central 10 arcmin of the ART-XC field of view in the data of pointed observations.
- Equatorial latitude > -30 deg, restriction imposed by the visibility conditions at the RTT150 site.

It should be noted that some parts of the sky may prove to be significantly underexposed by ART-XC observations compared to the sky average exposure should some technical problems (e.g. temporary switching off of the instruments) arise during the SRG mission. This will effectively lead to some further reduction of the TUBITAK sky region.

A new ART-XC source associated with the Agreement with TUBITAK, hereafter a TR ART-XC source, is a region of the sky with a diameter of 2 arcmin in the TUBITAK sky region at the center of which the ART-XC count rate has exceeded by at least 5 standard deviations the average background level for sky regions of similar size and exposure. In addition, that region of the sky may not overlap with the localization regions of previously known hard X-ray sources from the catalogs of existing all-sky surveys by BAT/Swift, ISGRI/INTEGRAL, PCA/RXTE and NuStar by the time the SRG surveys start.

X-ray data of the ART-XC survey associated with the Agreement with TUBITAK, hereafter ART-XC data are the coordinates with their error boxes and X-ray fluxes with their estimated errors in any predefined energy band of TR ART-XC source calculated from the data gathered during the entire ART-XC survey. Also the event lists of all the photon counts associated with a TR ART-XC source during the entire ART-XC survey will be provided. An event list provides the celestial coordinates, time of registration (UTC) and energy (keV) for each detected photon.

Procedure and timing of data delivery to TUBITAK for TR ART-XC sources. The ART-XC data for TR ART-XC sources detected during the scanning phase of the SRG mission will be delivered to the Turkish side in several portions, within a month after completing each consecutive scan of the sky (presumably lasting 6 to 7 months). Each time, TUBITAK obtains 2% of all new ART-XC sources that have been found as a result of the latest scan of the sky (i.e., after addition of the data accumulated in the latest scan to the data from all the preceding scans). TR ART-XC sources are selected randomly among all the sources discovered by ART-XC. The Russian side will propose a concrete algorithm and discuss it with TUBITAK before implementation; TUBITAK can also send its representative to IKI to monitor the selection of sources each time such a procedure is carried out. In total, there are planned to be 8 all-sky scans and therefore 8 regular data deliveries to the Turkish side. It should be noted that the sensitivity of the ART-XC survey is expected to improve approximately linearly as the survey proceeds, so that the majority of new ART-XC sources will likely be delivered upon completion of the later (6th – 8th) scans.

If after the completion of the last (presumably the 8th) all-sky scan the Turkish side has received in total less than 200 TR ART-XC sources, the Russian side will bring the total number to 200 sources by providing additional new ART-XC sources detected during the pointing phase of the SRG mission. These additional sources may

not be the target sources of pointed observations. Specifically, the search for new sources will be done within the ART-XC field of view excluding the central 10 arcmin diameter region around a target source. No more than one source per field of view can be given to the Turkish side. If there are more than one source in the field of view, a TR ART-XC source will be selected randomly among such sources.

In addition, if a TR ART-XC source selected during the scanning phase is chosen for pointed ART-XC observations, the Turkish side will be invited to a scientific collaboration with the Russian side on that source and informed about the results of the analysis of the data of the ART-XC pointed observations.

The proprietary period. The Turkish side is supposed to use (perform optical observations and prepare a publication) the data for a TR ART-XC source within two years after the data delivery. During this proprietary period, the Russian side will restrain from publishing any results for the TR ART-XC source using eROSITA data (if any). Furthermore, the Russian side will not include TR ART-XC sources into any catalogs based on ART-XC data during the corresponding proprietary periods. After the two years proprietary period mentioned above the data on TR ART-XC sources may be used by the Russian side for publication of catalog of ART-XC sources and in other studies.

Additional 2% or 200 new ART-XC sources for joint collaboration of Russian and Turkish scientists. The selection and data delivery procedure for these additional sources are the same as for TR ART-XC sources.