

Report of the RadioAstron International Science Council meeting of June 18-20, 2012

The RISC congratulated Nicolai Kardashev and the entire Astro Space Center team for their leadership and determination over more than 30 years resulting in the successful launch of RadioAstron and the magnificent early interferometer results in all four frequency bands. The RISC also thanked the Lavochkin Association and Roscosmos for their important role in making RadioAstron a reality, as well as the support and advice of previous RISC members.

Ken Kellermann reviewed the history of the RISC and noted that we are entering a third phase where the membership is composed of Russian Project Leadership (RPL), representatives from the supporting institutions, and individual scientific members. He remarked on the advisory nature of the RISC, which reports to the Project Director, to optimize the scientific returns from RadioAstron and the challenges created by the need to coordinate different ground and space facilities, each with their own cultures policies and procedures, and responsible to different national governments.

The RISC reviewed the draft Terms of Reference (ToR) produced by Ken Kellermann and Yuri Kovalev. Norbert Bartel, Rene Vermeulen, and Yuri Kovalev were asked to edit the draft ToR to reflect the comments and suggestions received from the RISC.

The RISC received reports on the results and status of the space radio telescope (SRT) in-orbit check out, the initial fringe search, the tracking station in Puchino, planned tracking capability in Green Bank and South Africa, and early science programs. All systems on the SRT are working close to design specifications except for a factor of three loss in the sensitivity of the K-band system, thought to be due to thermal distortion of the dish or improper illumination of the dish. Earlier problems with decoding the downlink signal and its power level appear to have been solved.

The RISC heard about the progress with the software correlator at the ASC, and was delighted to learn of the recent successful implementation of the MPIfR DiFX correlator which verified the parameters of detected fringes on baselines to RadioAstron. Additional correlation capability may be implemented in Socorro and JIVE. Members from the supporting institutions each gave a brief report on the potential participation from their facility. INAF, Yebes, Robledo, Usuda, KVAZAR, and Evpatoria have committed time to RadioAstron, while the other facilities will react to proposals following their normal review process. MPIfR (Effelsberg), the GBT, the EVN, the LBA, the WSRT, and Arecibo have each committed significant observing time for the Early Science Program in response to previously submitted proposals.

Decisions

In order to facilitate the effective operation of RadioAstron and to coordinate activities taking place at geographically dispersed locations, the RISC established the following technical working groups and suggested memberships:

Tracking Stations. Membership: A. Smirnov (ASC), Sergei Likachev (ASC), Glen Langston (NRAO), Marty Bloss (NRAO), Larry D'Addario (JPL).

Correlation: Sergei Likachev (ASC), Vladimir Kostenko (ASC), Petr Voitsik (ASC), James Anderson (MPIfR), Andrei Lobanov (MPIfR), Jon Romney (NRAO), Walter Bricken (NRAO), Adam Deller (ASTRON).

Orbit Determination: Viktor Stepanyants (KIAM); Leonid Gurvits (JIVE).

Recommendations

The RISC advised the ASC to develop an Open Skies phase of RadioAstron research beginning mid 2013. Recognizing the specialized experimental nature of RadioAstron, in order to optimize the scientific return the RISC suggested that the Open Skies phase be built around a limited number of consortia including AGN, masers, pulsars, the ISM, gravity, and astrometry. Participation in the consortia should be open to experienced investigators who are prepared to contribute to the implementation of RadioAstron Open Science program including mission support. It was agreed to hold a workshop, probably in Bonn in early December, 2012, to bring together scientists interested in forming consortia that will propose to RadioAstron as well as to the GRTs needed to implement the planned research programs.

It was noted that the requirement to meet separate proposal deadlines for various GRTs will complicate the evaluation, coordination, and scheduling of ground and space facilities. The RISC suggested that the call for Expressions of Interest (EoI) be issued no later than early August 2012, with a target date of early October 2012 for responses. Following discussions at the December 2012 Workshop, each consortium will be expected to submit to RadioAstron one or more proposals by the February 1, 2013, deadline to be evaluated by the ASC for technical feasibility, the RadioAstron Program Evaluation Committee (PEC) and the GRTs. The PEC will pass their evaluations to GRT program committees if requested. It was agreed that the observing consortia will have exclusive rights to the correlator output data for one year following delivery of the data from the correlator to the team(s). However, in view of the extensive space and ground facilities needed to carry out the RadioAstron Observing program as well as the broad interest in RadioAstron, each consortium will be encouraged to make their visibility data, calibrated to the degree dictated by the science requirements, publicly available in a timely way.

In view of the early technical delays and the need to properly inform participants interested in participating in the Open skies era, the RISC suggested extending the Early Science phase to mid 2013, recognizing that there will be overlap with the start of the Open skies phase.

The RISC appointed a Program Evaluation Committee (PEC) to review proposals for the Open Sky phase of the mission starting in mid 2013. The PEC will report to the RadioAstron Project Director. The following were appointed to the PEC, and have agreed to serve: Phil Edwards (CASS, Chair), Richard Porcas (MPIfR), Mark Reid (CfA), Misha Popov (ASC), Tim Pearson (Caltech), and Elaine Sadler (Sydney Univ.).

Following discussions with the RISC, the RISC RPL co-chair Nikolai Kardashev appointed Yuri Kovalev and Ken Kellermann as the RPL and international co-chairs respectively. Andrei Lobanov, Rene Vermeulen, and Carl Gwinn were appointed to serve on the Executive Committee along with the co-chairs. These officers will serve through the next face-to-face meeting of the RISC.

The RISC agreed to hold teleconferences in early August, mid September and mid October 2012.

It was noted that RadioAstron has an expected lifetime of 5 years, but that although there are no known limitations to a longer operational period, like any spacecraft, single point failures can occur at any time. Thus the RPL as well as the international VLBI community should not defer any opportunities for the effective use of RadioAstron.

The RISC noted the good publicity received by the RadioAstron in the Russian media, but noted the relative lack of visibility in the international media. The RISC recommends that the RPL as well as RISC members take advantage of any opportunity to advertize the accomplishments as well as potential research opportunities of RadioAstron.

The RISC noted that there appears to be insufficient resources to fully exploit the scientific return from RadioAstron. The RPL is encouraged to seek funds to support science activities within the project. This includes visiting scientists for periods ranging from a few weeks to a year, as well as supporting visits of the ASC staff, especially the younger members, to observatories and institutions outside of Russia.

The RISC encouraged better communication among the correlator teams in Moscow, Bonn, Socorro, and Dwingeloo which will be needed to insure the uniform treatment of the expected larger load of data expected during the ESP and Open Skies programs.

The RISC noted the opportunity for enhanced orbit determination made possible by the PRIDE technique, and suggested investigating the effectiveness of PRIDE by correlating at the JIVE SFXC correlator a short (~30 min) RadioAstron-EVN observation supported by simultaneous PRIDE-based orbit determination. Similarly, a quasi-simultaneous Spectr-R PRIDE and laser ranging observation should be considered.

Action Items

Modify and distribute for approval the draft ToR prepared by Kovalev, Vermeulen, and Bartel to reflect the possibility of not having an Executive Officer and to change the frequency of RISC meetings to “up to twice per year.” (Bartel, Kovalev)

Invite Pearson, Sadler, and Longair to serve on the PEC (Kellermann).

Draft Program Evaluation Committee guideline: (Edwards, Porcas)

Complete the preparation of the RadioAstron User Handbook (Edwards, RPL)

Investigate feasibility of holding a workshop in Bonn in the first half of December 2012 to form consortia to plan for the Open Skies phase (Zensus).

Draft Call for Expressions of Interest for the Open Skies phase of RadioAstron (Kovalev and Kellermann)

Distribute the call for ASKAP and MeerKat proposals to the RISC for background information (Edwards, Kellermann)

Make all PPT presentations and conference photos available on the RadioAstron web site (Ilya Pashchenko)

Issue Doodle poll for August, September and October 2012 telecons (Ilya Pashchenko)