

Memorandum of Understanding (MOU)
Between
XMM-Newton and
The National Radio Astronomy Observatory,
a facility of the National Science Foundation
operated under cooperative agreement by Associated Universities, Inc.

Purpose and Background:

Purpose

In recognition of the importance of radio observations using the National Radio Astronomy Observatory (NRAO), Green Bank Observatory (GBO) and Long Baseline Observatory (LBO) facilities to complement X-ray observations with the XMM-Newton Observatory, this agreement aims to establish a reciprocal and cooperative arrangement in which observing time on NRAO/GBO/LBO telescopes and on XMM-Newton is made available for coordinated observations on a competitive basis. The scientific programs that will be supported by this agreement are those that are enhanced by the combination of XMM-Newton observations with investigations using the radio facilities operated by the NRAO/GBO/LBO. The intent, in keeping with the missions of both XMM-Newton and the NRAO/GBO/LBO, is to maximize data availability and scientific return for the entire user community.

Background Description of XMM-Newton

The European Space Agency's (ESA) X-ray Multi-Mirror Mission (XMM-Newton) is ESA's second cornerstone of the Horizon 2000 Science Programme. It carries 3 high throughput X-ray telescopes with an unprecedented effective area, and an optical monitor, the first flown on an X-ray observatory. The large collecting area and ability to make long uninterrupted exposures provide highly sensitive observations. The XMM-Newton mission is helping scientists to solve a number of cosmic mysteries, ranging from the enigmatic black holes to the origins of the Universe itself. Observing time on XMM-Newton is being made available to the scientific community, applying for observational periods on a competitive basis. The XMM-Newton Science Operations Centre (SOC), located at the European Space Astronomy Centre (ESAC) in Villafranca near Madrid, Spain, is responsible for the science operations. Starting with the reception of the observer's proposals to the final delivery of calibrated scientific products to the observer, the activities of the SOC comprise all the necessary steps to ensure high quality and reliability of the scientific data. It also includes the provision of a major analysis software package, the Scientific Analysis System (SAS), needed by the observers for optimum exploitation of the XMM-Newton data, and the XMM-Newton Science Archive (XSA).

Background Description of NRAO/GBO/LBO Radio Telescopes

The NRAO operates the Karl G. Jansky Very Large Array (Jansky VLA), an arcsecond-resolution centimeter-wave interferometer array. The GBO operates the Robert C. Byrd Green Bank Telescope (GBT), a precise 100m single-aperture telescope. The LBO operates the Very Long Baseline Array (VLBA), a milliarcsecond-resolution continent-wide interferometer array. In addition, the NRAO is the North American Executive of the Atacama Large Millimeter/Submillimeter Array (ALMA). The present agreement covers the use of the VLA, GBT and VLBA. The GBT, VLBA, and VLA are pointed telescopes generally allocated for PI proposals; their data proprietary period is 12 months, beginning at the time of the last observations associated with a proposal. NRAO accepts proposal submissions on February 1 and on August 1 each year, for observing scheduled in semesters starting in October and April. NRAO is funded by NSF as a research facility that operates state-of-the-art telescopes in an "open skies" mode for the entire astronomical community.

General Responsibilities of Both Parties

Scope and Purpose of Joint Program

This agreement commits observing time on NRAO/GBO/LBO telescopes for correlative observations of XMM-Newton sources, and observing time on the XMM-Newton satellite for correlative observations of NRAO sources. The available time will be awarded on a competitive basis, and will be subject to approval by the NRAO /GBO/LBO Director and the XMM-Newton Project Scientist.

The scientific programs supported under this program are restricted to those that are enhanced by the combination of XMM-Newton observations with investigations using the radio facilities operated by NRAO/GBOLBO.

All standard observing restrictions for both observatories will apply to joint proposals under this program.

This program supports two distinct types of joint opportunities between NRAO/GBOLBO and XMM-Newton. The two opportunities are described below.

Specific Roles and Responsibilities of Both Parties

Joint Proposals Opportunity: Access to NRAO Telescopes

By this agreement, NRAO/GBOLBO permits the XMM-Newton Observatory to award VLA/GBT/VLBA observing time.

No more than 3% of the open skies scientific observing time will be made available on the VLA, GBT or VLBA through this agreement (as an indication, this corresponded to approximately 105/82/34 hours respectively in Semester 18A). The allocation of time on the Atacama Large Millimeter/Submillimeter Array (ALMA) is not covered by this agreement.

Only proposals falling in the NRAO/GBOLBO Regular proposals and Triggered proposals categories are eligible for observing time through this joint opportunity.

Radio data acquired through the XMM-Newton Program will be the property of the proposers for the standard NRAO 12-month proprietary period. Unless the users petition for an extension of the proprietary period, the data will then become publicly available in the NRAO Archive.

The peer-reviewed XMM-Newton proposal evaluation process will identify programs with sufficient merit to be allocated observing time, and those that fall within the agreed range of NRAO/GBOLBO observing time will be allocated NRAO/GBOLBO observing time without additional scientific review, if judged technically feasible, and provided compelling justification is provided to XMM-Newton that such observations substantially enhance the scientific reach of the proposed observations. NRAO/GBOLBO will perform feasibility checks on the proposed observations and reserves the right to reject any observation determined for any reason to be technically unfeasible or to jeopardize NRAO/GBOLBO instrumentation. Such a rejection could jeopardize the entire proposed science program and impact the award of XMM-Newton observing time as well.

Joint Proposals Opportunity: Access to XMM-Newton Observations

By this agreement, the XMM-Newton Observatory permits NRAO/GBOLBO to award up to 150ks of XMM-Newton observing time per year. This award of time shall occur without further scientific review by the XMM-Newton Observatory, provided compelling justification is provided to NRAO/GBOLBO that such observations substantially enhance the scientific reach of the proposed observations.

The peer-reviewed NRAO/GBOLBO proposal-evaluation process will identify programs with sufficient merit to be allocated observing time by NRAO, and those that fall within the agreed range of joint programs will be allocated XMM-Newton observing time without additional scientific review if they are judged to be technically feasible. The XMM-Newton Observatory will perform feasibility checks on the proposed observations and reserves the right to reject any observation determined to be technically unfeasible for any reason. Such a rejection could jeopardize the entire proposed science program and impact the award of NRAO/GBOLBO observing time as well.

Proposed observing time on XMM-Newton may be time-constrained, including coordinated and monitoring observations, and Targets of Opportunity, if full justification is included in the proposal. Note that proposed XMM-Newton observing time can include monitoring that precedes, follows and/or (for TOOs) triggers NRAO/GBOLBO observing time.

XMM-Newton data sets obtained under this agreement will be proprietary to the PI for the same 12-month period as other XMM-Newton data.

Criteria for Award of Joint Observing

Observing time under this program will be awarded only to proposals that require use of both observatories to meet the primary science goals and shall not apply to usage of archival data. No NRAO/GBO/LBO time will be allocated without XMM-Newton time, and vice versa.

Establishing Technical Feasibility

Establishing technical feasibility is the responsibility of the PI. To do so, proposers are strongly encouraged to:

- review the NRAO Call for Proposals, the GBO Call for Proposals and/or the LBO Call for Proposals
- consult the XMM-Newton Announcement of Opportunity
- contact the XMM-Newton Helpdesk and/or the NRAO Helpdesk in case of questions

Credits and Attributions

For results obtained using XMM-Newton and NRAO/GBO/LBO facilities, proper attribution to NRAO facilities must be included in all publications, conference proceedings, posters, abstracts and talks and colloquia. Such attribution should read: "The National Radio Astronomy Observatory (or Green Bank Observatory, or Long Baseline Observatory) is a facility of the National Science Foundation operated under cooperative agreement by Associated Universities, Inc."

XMM-Newton attribution is required for all XMM-Newton observations made under this program. Attribution for the observations will be the same as for all other use of XMM-Newton data products.

Terms of Memorandum

This agreement shall begin on May 1st 2018, or upon the date of its signing by both Parties, whichever is later, and will thereafter renew automatically for 12 months on the anniversary of that date, unless either XMM-Newton or NRAO/GBO/LBO informs the other Observatory that it is terminating the agreement.

This agreement may be suspended by mutual agreement of the signatories in the event of a major equipment failure on the XMM-Newton spacecraft or in the case of a major event that renders NRAO/GBO/LBO infrastructure incapable of supporting antenna operations for an extended period of time.

This agreement may be amended, subject to the written agreement of both signatories or their designated representatives.

AUI/NRAO



Digitally signed by
Tony Beasley
Date: 2018.04.16
12:51:49 -04'00'

Signature / Director

XMM-NEWTON



Signature / Director

17/4/2018
N. Scharnel