General Programmatic Terms and Conditions for the University Radio Observatories Program (AST-URO) (NSF 05-568)

1. **Key Personnel:** Except for the Principal Investigator(s) (PIs) or Co-PIs identified in this award, requests to make any changes to personnel, organizations, and/or partnerships specifically named in the proposal, that have been approved as part of this award, shall be submitted in writing to the cognizant NSF Program Official for approval prior to any changes taking effect. Requests for prior approval of changes to the PI(s) must be submitted through FastLane for review by the Cognizant NSF Program Officer and approval by an NSF Grants Officer.

2. **Project Description:** The Combined Array for Research in Millimeter-Wave Astronomy (CARMA) is a collaborative effort involving four universities: California Institute of Technology, the University of California at Berkeley, the University of Maryland, and the University of Illinois. CARMA was created by moving the six 10-meter telescopes at Caltech's Owens Valley Radio Observatory and the nine 6-meter telescopes at the Berkeley-Illinois-Maryland Association (BIMA) array to a new location at Cedar Flat in the Inyo Mountains near Bishop, California. The new science enabled by CARMA covers a broad range of astronomical topics, including star formation and molecular clouds, studies of external galaxies, and the investigation of solar system objects.

   The project will provide array operations support and development for the benefit of the member universities and for the general astronomical community, with 30% of observing time to be allocated to the community. The member universities will train students in millimeter-wave astronomy and instrumentation, will engage in other education and public outreach activities, and will endeavor to increase diversity, broaden participation, and establish connections with minority serving institutions. The project will also establish a data-reduction pipeline and a user-friendly archive. The archive will allow public access to CARMA data by the general astronomical community following an 18-month proprietary period for projects other than student thesis research.

3. **Project Governance:** The Awardees will ensure that an efficient and effective project governing structure is in place throughout the award period to support all project activities.

   CARMA Project Structure

   The CARMA Association consists of the California Institute of Technology, the University of California at Berkeley, the University of Illinois, and the University of

Maryland**.** This Association coordinates the separate activities of its member institutions to accomplish the common objective of developing, financing, constructing, managing, and operating CARMA.

The CARMA Board of Representatives (The Board) has overall authority and responsibility for fiscal oversight, long-term policy, operation and management of CARMA. The Board has four members representing each of the original CARMA Association institutions, each with one vote, two non-voting array scientist members, representing Caltech and BIMA, and one non-voting member from the general astronomical community. The Board recommends allocation of funds received from member institutions deriving from federal grants, and state and private resources. It determines the schedule of the project and implements periodic formal reviews of progress. The Board, in consultation with the CARMA Science Steering Committee, is responsible for decisions regarding project appointments, particularly those of the CARMA Director and Assistant Director for Operations*,* and for changes in the membership of CARMA.

The Science Steering Committee (SSC) is the principal advisory body to the Board. The SSC consists of eight scientists - four from Caltech, two from Berkeley, and one each from Illinois and Maryland. SSC decisions require six of eight votes. The Board appoints the CARMA Director from one of eight members of the SSC. The Director implements the policies and decisions of the Board in consultation and coordination with the Science Steering Committee and coordinates the operation, oversight, and management of CARMA, including any facilities, equipment, projects, finances, and personnel committed by the member institutions.

The CARMA Director serves as the project's principal point-of-contact with the NSF. Under circumstances where communication is required between NSF and the CARMA Board, such as during the appointment of Key Personnel or in relation to major fiscal or policy issues, the CARMA Board Chair will serve as the point-of-contact.

The CARMA Project Manager will provide detailed oversight of array activities during completion of the commissioning phase. As commissioning transitions to full operations, the Project Manager position will be replaced by that of Assistant Director for Operations. The Assistant Director for Operations will be resident at the observatory and will have responsibility for day-to-day observatory operations.

NSF will establish an internal CARMA Oversight Group (COG). The COG will consist of the cognizant NSF Program Officer on this Cooperative Agreement, who will serve as its head, plus 2 other Program Officers from AST, and may include one member from the Division of Grants and Agreements. The COG will review all CARMA reports and will participate in any site visits. The cognizant

Program Officer will be the Foundation's point-of-contact with the CARMA Director and the CARMA Board.

4. Reporting Requirements: The Awardees will provide regular reports to NSF as listed below. Additional ad hoc reports may be requested on occasion under special circumstances as designated by the NSF cognizant Program Officer. The Awardees will submit all required reports via FastLane using the appropriate reporting category; for any type of report not specifically mentioned in FastLane, the Awardees will use the "Interim Reporting" function to submit reports. Given the collaborative nature of this project, unless otherwise requested the reports should contain the contributions of all participating CARMA institutions in a single unified document. Each institution will submit the unified reports to Fastlane, with the inclusion of additional information pertinent to each institution (such as outside support for Senior Personnel).

Intermediate Progress Updates will be submitted to NSF within 30 days of the midpoint of the program year, and will consist of: a summary of work accomplished during the reporting period including major scientific and technical accomplishments; an assessment of current status against scheduled status; a review of current or anticipated problem areas and corrective actions; a summary of subawardee and subcontractor accomplishments; and all progress in the areas stated in Project Governance.

5. Awardee Support of Ongoing NSF Management and Oversight: The Awardees will ensure full commitment and cooperation among all CARMA components and all project staff during ongoing NSF project management and oversight activities. The Awardees will ensure availability of all key institutional partners during any desk or on-site review as well as timely access to all project documentation.

The Awardees will monitor performance of subawardees, including managing all performance related issues; the PI for each award will serve as the project point of contact for the NSF cognizant Program Officer, including providing notification of any critical project management issues such as changes in key personnel, cost, schedule, and funding profile prior to implementation of such changes.

Reviews: NSF (through the COG) may, at its discretion, conduct a review of the Project at least once per year. The COG will review project management, scientific and technical achievement, community access, and broader impacts, with possible assistance from an external panel of experts. The reviews will be held on mutually agreed upon dates and locations.