

ANASAC Charge #1: Should NRAO have a User Grants Program

From: Charge 1 sub-committee

John Bally	John.Bally@colorado.edu
R. Todd Clancy	clancy@spacescience.org
Xiaohui Fan	fan@as.arizona.edu
Alycia Weinberger	alycia@dtm.ciw.edu

CHARGE 1. Should NRAO Provide a User Grants program?

DRAFT ANASAC RECOMMENDATION:

We recommend that NSF funding be associated with ALMA time allocation for US investigators. A User Grants program that funds observers is required for efficient utilization of the NSF investment in ALMA and to preserve US competitiveness with partner countries who provide funding.

Currently, NSF funding and time-allocation on ground-based observing facilities are decoupled. Researchers must submit *separate* observing time requests and funding proposals to support data analysis and publication. This is an inefficient use of resources as some researchers will win observing time but not the funds to support analysis; others will be awarded funds, but not observing time to get the data. This is especially likely in a highly over-subscribed environment in which most proposals are of high quality, but most can't be selected.

In contrast, in Europe, Japan, and Canada, research activities such as travel, page charges, and computer resources are provided by the home institutions. Post-docs and graduate students are generally supported by their universities. The current decoupling of funding and observing time puts US scientists at a competitive disadvantage compared to those in the partner countries.

Linking data analysis funds to the development of a new facilities was a key recommendation in the last decadal survey (the McKee-Taylor Report): *'To achieve the full scientific potential of a new facility, it is essential that, prior to construction, funds be identified for operation of the facility, for renewal of its instrumentation, and for grants for data analysis and the development of associated theory.'*

NASA missions such as the Hubble, Chandra, and Spitzer Space Telescopes have shown that user grant programs maximize the return on capital investment, produce high quality science results, rapid publication, and incentives for new students to enter highly technical fields. A similar ALMA User Grant program will stimulate the user community and bring in new users working across the EM spectrum from high-energy, optical/IR, and radio wavelengths. The User

Grant program will contribute to the high-technology skill base of the US labor force in a regime especially important for our technical future.

We recommend the ALMA User Grants Program be funded at a level of \$6 M / year in FY2006 units. We arrive at this annual amount by assuming that a minimum observing allocation that gains funding should be half a track (4 hours) and that two to three tracks (20 hours) be sufficient for a graduate student project. Setting a floor to the funding of \$10,000 and graduate student support plus research funds or a summer faculty month, to \$50,000, the ‘value’ of an ALMA hour is about \$2,500. For a US share of 27%, or about 100 days per year, the total grant amount is \$6M.

This level of funding is comparable to existing NASA programs. Recent user grants (including archive and theory programs) for large NASA missions in FY04(*) include: HST with about 3000 (90 min) orbits / year, funded at a rate of \$21 M / year (\$4,700 / hour). Chandra with a total of 16.5 Msec /year is funded at a rate of \$11 M / year (\$3,700 / hour). The smaller GALEX mission has a User Grant program of \$3 M to cover 1,500, 98 min. orbits with 1,500 seconds of integration per orbit (Cycle 2; \$4,800 / hour); FUSE cycle 8 GO program is \$1.5 M / yr to cover 12 Msec (\$450 / hr). HST is a complex mission with many modes while FUSE takes only spectra. ALMA will produce data far more complex than any of these missions and will consist of large data cubes, multiple array configurations, frequencies, resolutions, and polarizations.

We suggest two potential implementations for an ALMA User Grants program. [A]. Allocation and administration of grants by NRAO through its program review process. [B] A dual review system in which the observing proposals are first evaluated for scientific merit by the ALMA program review. Successful proposals would then be forwarded to an NSF panel for funding consideration. A budget may be requested at this stage but the proposal will be the same as that submitted to the ALMA review. Option B allows ALMA science and demand to be directly compared to other facilities and enables the NSF to maintain programmatic balance.

We recommend that funding allocations be based on the amount of observing time, program complexity, and need. ALMA is a complex instrument with many modes that enable a vast range of program complexity. To avoid undue administrative complexity and overhead, small programs that either request only a few hours of ALMA time or which, according to the funding criteria, would be granted less than about \$10 k, should not be funded. However, NRAO should provide travel funds and page charge support for such small programs. We urge programmatic and administrative efficiency to minimize overhead costs, and to avoid unnecessary paper work such as annual reports. Up to 10% of the funding should be allocated for theory, archival work, and laboratory research relevant to ALMA science. The administration of this program should be carefully considered with inputs from the NSF and the non-ALMA astronomical community and should NOT be solely an NRAO process.

* http://www7.nationalacademies.org/bpa/CAA_Presentation_Kinney_Nov04.pdf.