

NRAO - ESO - NAO MEETING

PROSPECTS FOR A COMMON MMA - LSA - LMSA ARRAY

1999 February 10
Associated Universities, Inc.
Washington, DC

Draft Minutes

1. Representatives of the National Astronomical Observatory of Japan (NAOJ), the European Southern Observatory (ESO) and the National Radio Astronomy Observatory (NRAO) met at the offices of Associated Universities, Inc. (AUI) to discuss the prospects for a merger into a common array of three similar millimeter/submillimeter array projects: the Large Millimeter and Submillimeter Array (LMSA) of the NAOJ, the Large Southern Array (LSA) of ESO and collaborating countries in Europe, and the Millimeter Array (MMA) of the NRAO.

Meeting Participants:

Representing the NAOJ: K. Kodiara and M. Ishiguro

Representing the ESO: R. Giacconi and K. Menten

Representing the NRAO: P. Vanden Bout and R. Brown

2. The meeting agenda is attached as Appendix A. There were 3 main topics of discussion:
 - Description of the present US-European Planning for a joint array;
 - Description of the LMSA status;
 - Steps toward a 3-way partnership.
3. The US - European planning was discussed. It consists of three sequential steps.
 - A resolution of intent was signed in 1999 January that expresses the desire of both sides to continue the design and development work on both the LSA and the MMA, to establish a means to coordinate that development until a MOU can be agreed to cover the joint design and development activities and to include in that MOU a commitment to develop an agreement for construction that merges the two projects into a single project. The resolution of intent further acknowledges the desire of both sides to discuss with NAOJ the feasibility of including the LMSA in the new merged array.
 - The two sides aim to agree by May 1999 on a MOU to cover the joint design and development phase that will provide a framework for the work done in Europe and that done in the U.S. to be coordinated. The goal is to have that MOU signed by all involved agencies by the end of the summer of 1999.

- Finally, an Agreement for construction of a joint array will be drafted in the period between the summer of 1999 and the summer of 2000. This agreement will set up a single project office to oversee construction and it will establish the commitments of all participants to the agreed tasks and schedules that will lead to the joint array.

4. The NAOJ representatives described the status of the LMSA project and their plans for the design and development phase of that project. The LMSA project is pursuing four initiatives in the Design and Development phase:

- A contract has been let for a prototype 10 meter antenna that will have many of the properties needed for the LMSA antenna; the prototype can be used for engineering evaluation and single dish science;
- A prototype receiver will be built including both millimeter and submillimeter bands that can be used for antenna evaluation and first science;
- Advanced designs for submillimeter SIS mixers will be developed and evaluated;
- A single baseline FX correlator will be constructed for initial testing of array components.

Funding for the LMSA Design and Development phase will come from application of some of the Project Rainbow funds that have been approved by the Ministry of Education, Science, Sports and Culture (MESSC). Approximately \$6M can be expected for FY98 and each of the two succeeding years from a supplementary MESSC budget.

A LMSA Project Office and Management structure has been established in Japan that includes oversight and advisory committees in addition to Working Groups of scientists and engineers in the areas of System, Antenna, Receiver, Correlator, Computing, Phase Correction, Site and Science.

5. The group discussed the steps involved in expanding the MMA-LSA partnership planning to include the LMSA in a three-way partnership in a single project. The NAOJ representatives noted that it was the desire of the Japanese community to form a partnership with the U.S. and European groups in which all three partners contributed equally and were equal beneficiaries of the observing time on the array. This led to a discussion of the practicalities involved in setting up such a partnership in which there was good agreement about the approach to be taken, but in addition a number of points requiring future clarification were also identified.

- It was agreed that the Japanese, U. S. and European groups should coordinate their respective Design and Development work. To assure that such coordination leads to a common set of Project goals, the U.S. and European groups have drafted a Memorandum of Understanding (MOU) that defines a process by which those goals will be defined, agreed to, and supported by the Design and Development resources available to the two partners. The NAOJ representatives would like to review the provisions of that MOU with colleagues in Japan and determine whether or not the NAOJ could participate with the U.S. and European

groups. ACTION: R. Giacconi to seek permission of the European Coordinating Committee to send a draft of the MOU to the NAOJ for review.

- Many issues were discussed involving the construction and eventual operation of a joint array in Chile. The NAOJ representatives emphasized the need for flexibility in such a prospective joint project, flexibility in funding timescales, institutional requirements, and cultures. It was agreed that planning discussions for such a 3-way partnership should begin soon as there are many issues to discuss and many possible approaches to evaluate. The issue of *flexibility* in the partnership was of concern to the U.S. and European groups because it has the potential to run counter to the need for each partner in the partnership to commit firmly to performance specifications and delivery schedules for the contributions that partner will make to the project.
- It was agreed that the construction phase of the joint project should be directed by a single Project Office. The staff members for that Project Office should come from the 3 partners in approximately equal numbers.
- It was agreed that a single, common, approach should be made for use of the Chile site to CONICYT on behalf of the 3 partners and that the entire area requested would be used in common.
- It was agreed that the joint project should have a single point of contact in Chile for relations with the Chilean government, CONICYT, and Chilean universities. This is regarded as important to assure that everyone in Chile has the same awareness of the project. The point of contact should be identified as soon as the partnership is secure.

6. Next Meeting. Future meetings are dependent on the on the outcome of the review for possible Japanese participation in the draft MOU being negotiated between the U.S. and European groups for a joint Design and Development program. Following this review the NAOJ will suggest the role, date and venue for the next meeting.

Appendix A

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Draft Agenda

I. Description of the Present US-European Planning for a Joint Array

1. Overall Planning Strategy—the January 20, 1999 Resolution
2. Outline of the MOU for the Design and Development Phase (1999 - 2001)
3. Issues likely to be addressed in the Agreement for array construction and operation (2001 and subsequent years)

II. Description of the LMSA Status

4. Timescale for the project and timescale for resource availability
5. National and institutional requirements for NAO participation in a joint US - European - Japan array

III. Steps Toward a 3-Way Partnership

6. Is it feasible to coordinate a common design and development program by extending the US-European MOU?
7. Is it feasible to form a partnership for construction and operation of a joint array directed by a single project office staffed by individuals from the partner institutions?
8. Single approach to CONICYT for use of the entire site.
9. Awareness in Chile of the intention to form a 3-way partnership.