

**DRAFT**

**ALMA LEGAL ORGANIZATION:  
TASK-BASED OPTIONS**

**Report of the ACC Working Group on ALMA Legal Organization in Chile**

(Draft 5 June 2000)

**I. Overview**

*Purpose:* It is the common goal of the U.S. National Science Foundation (NSF) and the European Coordinating Committee (ECC) to build and operate the Atacama Large Millimeter Array (ALMA) as a bilateral partnership of equals. ALMA is a long-lived, thirty years or more, facility for astronomical research to be built in the Altiplano region of northern Chile.

*Representation:* The European organizations participating in the ECC have identified the European Southern Observatory (ESO) as their primary representative and executive for dealings by the ALMA partnership with the Republic of Chile to build and operate ALMA in Chile. The NSF has identified Associated Universities, Inc. (AUI) as its primary representative and executive for such dealings.

Under different legal authority, both ESO and AUI may secure permission from the Republic of Chile to build and operate the ALMA observatory in Chile. ESO is an international organization that currently operates two observatories in Chile under a Convention signed in 1964 and subsequently amended in 1995. ESO's participation in ALMA will require the approval of the Chilean government most likely through a specific amendment to the Convention related to ALMA. AUI is a not-for-profit education and research corporation granted permission by the Republic of Chile in 1998 to build and operate the Millimeter Array (MMA) in Chile through the University of Chile under the authority of Public Law 15172 as amended. Law 15172 is the authority by which the Association of Universities for Research in Astronomy (AURA) and the Carnegie Institution have operated the Cerro Tololo Interamerican Observatory (CTIO) and the Las Campanas Observatory, respectively, in Chile for more than thirty years.

*Parity:* It is the desire of the ALMA partners that in so far as possible parity be maintained in the construction and operation of ALMA, both with regard to resources brought to the project by the two partners and with regard to benefits derived from the project. In those cases where the goal of achieving parity may interact with the goal of efficient conduct of the ALMA project, in construction or operations, the common intent is to maximize the benefit to the partnership by building on the existing institutional strengths of the partners.

*Derivation of Options for ALMA Legal Organization:* The approach taken by the ALMA Coordinating Committee (ACC) Working Group on ALMA legal organization is

to recognize (1) the differing institutional strengths that the two partner executives, ESO and AUI, bring to the project; (2) the goal of achieving parity within the partnership, and (3) to create an organizational model which provides maximum efficiency and benefit to the project based specifically on what the partnership is trying to accomplish. The operational model will assign task responsibilities to the two executives, ESO and AUI respectively, with the explicit understanding that the executives will exercise their responsibilities through work shared by both partners.

*Additions to the ALMA partnership:* The organization for ALMA should facilitate the addition of Japan as a third, major, partner should this possibility become a reality.

## **II. ALMA Operating Model**

We propose to use an operational model to delineate the tasks required to operate ALMA and to develop a possible overall division of those tasks between the two partner executives, ESO and AUI, based on the institutional experience and existing infrastructure that these two organizations bring to the project.

The AUI through the National Radio Astronomy Observatory (NRAO) and ESO bring institutional strengths to the ALMA project that are complementary. ESO has long experience operating in Chile, experience dealing with the Chilean government, experience contracting in Chile, and experience with personnel staffing both international and in-country. AUI has long experience in the science operation of radio synthesis arrays; the experience includes instrumentation development, and development of the special purpose software required to produce images of synthesis interferometry data. With ESO and AUI together, this is a nearly ideal partnership for ALMA, a synthesis array radio telescope to be built and operated in Chile.

A possible model for operation of ALMA as a shared responsibility between ESO and AUI is given as an example in the Annex to this report. The actual model for ALMA operations and the division of responsibilities will be decided by the ACC. The point we wish to make here is this: *In order to discuss options for the legal structure of ALMA, we need to define ALMA; we have defined ALMA as a task-shared responsibility of the two primary representatives, ESO and AUI.* The model in the Annex is meant to illustrate that concept of *shared responsibility*. The intent is to assign organizational leadership and responsibility for a given task to one side of the partnership or the other; the partner given that responsibility is expected to exercise it, or some aspects of it, in cooperation with the other partner institution or institutions. *Responsibility is assigned, but the work is to be shared.*

### **III. Legal Organization of ALMA Operations in Chile**

As is highlighted in the discussion above, we regard the fundamental organization of ALMA to be a shared responsibility of the two primary representatives, ESO and AUI. In principal, either institution could represent ALMA to the government of Chile on behalf of all the participating ALMA organizations. In either case, the interface to the government is simple, and no new institutions have to be established. An *ALMA Agreement* that clearly defines the role of the representative institution, and the relation of the organizations participating in ALMA to that institution, will have to be negotiated and signed outside of Chile. Within Chile, ALMA will be presented to the government by the agreed representative institution, ESO or AUI, acting on behalf of the ALMA partnership.

#### **1. ESO as the Responsible Agent for ALMA in Chile**

With agreement of the ALMA partners, ESO could seek to amend its treaty to include permission to build and operate ALMA in Chile. In this case ESO would have the leadership role in representing the ALMA partnership to the government of Chile. This is the option we have highlighted earlier as being most consistent with the resources and experience of the two partner representatives. For this option,

- The request for permission of the government of Chile to make use of the Chajnantor site would be led by ESO on behalf of the ALMA partnership;
- Materials imported for ALMA would all be imported under the ESO permissions;
- Personnel assigned to Observatory Operations, either by AUI or by non-ESO European institutions, would enter Chile accredited with international (diplomatic) status by ESO;
- Consistent with the principle of *assigned responsibility but shared effort*, ESO and AUI will participate together in all discussions with the Chilean government involving ALMA.

Access by the ALMA partnership to the ESO institutional infrastructure and status in Chile is a key advantage of this approach. Potential issues involve the willingness of the Chilean government to extend to ALMA the ESO status, and if so the process and timescale needed to secure that permission. ESO attorneys estimate the approval process will require two years; construction before this date will require that provisional solutions are negotiated

#### **2. AUI as the Responsible Agent for ALMA in Chile**

With agreement of the ALMA partners, AUI could represent the ALMA partnership to the government of Chile. We believe that continued pursuit of this and other options is needed to guard against the possibility that the option with ESO serving as the responsible agent for ALMA would become unavailable for legal or political reasons. In this case,

- The request for permission of the government of Chile to make use of the Chajnantor site would be led by AUI on behalf of the ALMA partnership;
- Materials imported for ALMA would all be imported under the AUI permissions.
- Consistent with the principle of *assigned responsibility but shared effort*, ESO and AUI will participate together in all discussions with the Chilean government involving ALMA.

The key advantage of this approach lies in its ability to be implemented soon—parliamentary approval is not necessary. Issues needing resolution involve the ability of ESO to participate institutionally in the organization and how task assignments could be divided equitably based on institutional strengths and resources.

### **3. Initiatives for a Combined ESO+AUI Representation as the Fiduciary Agent for ALMA in Chile**

With the aid of material supplied from several sources, the ACC Working Group has considered several models in which AUI and ESO, together, represent ALMA to the Chilean government and seek permission to build and operate the array. We have not been able to identify an effective model of this kind; all prospective plans founder on one or both of the same two issues. Namely,

- The differing permissions under which AUI and ESO may operate in Chile necessarily means that different legal *regimes* apply to the two institutions and the employees of those institutions<sup>1</sup>.
- Formation of a single, joint ESO-AUI, entity for ALMA outside of Chile which would then approach Chile for permission to build and operate ALMA, can only be done via a treaty organization or via a corporation. The treaty organization would then negotiate permission with the Chilean government; the corporation would enter Chile via Public Law 15172. Since these two avenues are presently available to the ALMA partnership using ESO permissions on the one hand, or AUI permission on the other, no new option becomes viable<sup>2</sup>.

The Working Group therefore recommends that consideration of all such joint initiatives be abandoned.

## **IV. Recommendations**

---

<sup>1</sup> It is our understanding that this issue could, in principal, be resolved by agreement between AUI and ESO on the form of the legal entity (e.g. Chilean Sociedad Anonima, multi-national compact, etc.) authorized to proceed with the project under Chilean law.

<sup>2</sup> This possibility should be revisited should the partners agree that a single joint entity would be optimal for some purposes/functions while for others it would be advantageous for the partners to proceed separately (albeit with suitable contractual arrangements in place). We have explicitly assumed here that the joint entity is the sole common intent.

In order to start negotiations with the Chilean side without further delays with the aim to assure access to the site as required by the project schedule and to have one joint approach in these negotiations, the Working Group makes the following recommendations which we categorize in the areas of effectiveness, equity and parity.

#### Effectiveness

1. The Working Group encourages the ACC to place primary emphasis on Option 1 above, *ESO as the Responsible Agent for ALMA in Chile*. It should be made clear to the government of Chile that ESO is acting on behalf of the ALMA partnership. Moreover, consistent with the principle of *assigned responsibility but shared effort*, ESO and AUI will participate together in all discussions with the Chilean government involving ALMA.
2. A joint US-European negotiating team be established to start negotiations with Chile at an appropriate level. This team should be provided with adequate legal representation from both sides.
3. Nothing be done to compromise our ability to make use of Option 2, *AUI as the Responsible Agent for ALMA in Chile*, to guard against the possibility of Chilean resistance to Option 1 or delayed permission.

#### Equity

4. Work on drafting an *ALMA Agreement* should begin immediately. This agreement will define the specific role and authority of ESO's serving as the Responsible Agent for ALMA in Chile and the relations among all the organizations participating in ALMA.
5. Work on drafting an operating model for ALMA should begin immediately. The model should provide for a specific division of tasks and incorporate fully the principal of *assigned responsibility but shared effort*.

#### Parity

6. The ACC should initiate a discussion on ways to assure parity between the two sides of the project. In addition to the plans incorporated in the operating model noted in point 5 above, ideas should be exchanged involving the assignment of principle responsibility to one side for the construction phase of the project and to the other side for the operating phase.

## **ANNEX 1:**

### **A Possible Task-Based Operations Model for ALMA that Respects Parity**

We illustrate here an operational model to delineate the tasks required to operate ALMA. We will then outline a possible overall division of those tasks between the two partner executives, ESO and AUI, based on the institutional experience and existing infrastructure that these two organizations bring to the project. The task division will focus on achieving parity. However, we emphasize that both ESO and AUI will, in their executive capacities, be expected to exercise leadership roles for the entire ALMA Project.

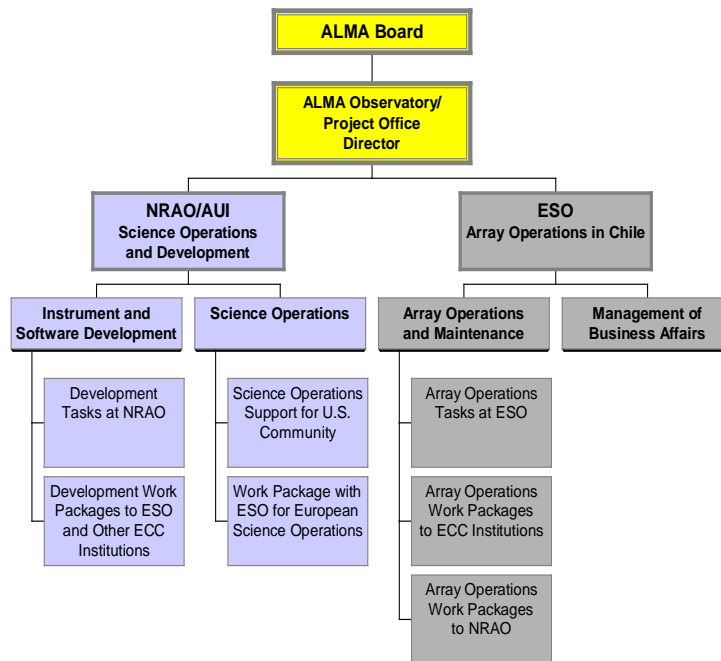
The *baseline* model for ALMA operations presented here is patterned after the discussion in the ALMA Project Book. This model has not been approved or endorsed by the ALMA Coordinating Committee, nor by the ECC, ESO, the NSF or AUI. However, since the model is based on a combination of tasking taken from operation of the Very Large Array (VLA) radio telescope, and from administrative tasks common to the ESO observatories in Chile, the functional representation of the model is complete even if the organization of those functions should ultimately be different from the model given here.

The organization chart used here for ALMA operations appears on the following page. At the highest level it consists of the following four primary areas of responsibility:

*ALMA Board:* This is the project's governing body. Its antecedent is the ACC. It consists of administrative representatives of the two partners. It sets the annual budget and provides primary guidance for the scope of ALMA operations. The ALMA Board is not a legal entity (i.e. it is not incorporated, has no authority to contract services or employ people).

*ALMA Observatory/Project Office:* In the construction phase of the project this is the *Project Office*. It will then consist of a small staff responsible for management of the construction project. It will manage the construction budget, allocate resources, assure schedule compliance, set standards and control the configuration. The Project Office is small, approximately seven individuals, employees from AUI and ECC member institutions respectively. In its operations phase, the *ALMA Observatory* will be responsible for the senior scientific and administrative management functions. Again, the staff is small and serves a managing function for the tasks assigned to the two partners. Its primary purposes are (1) to establish operational priorities; (2) to allocate tasks and resources to the partners, and (3) to be responsible to the ALMA Board for observatory tasks, schedule and budget. The ALMA Observatory/Project Office is not a legal entity; given the division of tasks outlined below it would seem most appropriate that it be co-located with the NRAO.

## ORGANIZATIONAL STRUCTURE OF THE ATACAMA LARGE MILLIMETER ARRAY



*Array Operations in Chile:* This administrative entity is responsible for all the ALMA operational tasks in Chile. It includes all the tasks and responsibilities related to conducting scientific observations and maintenance of the equipment. It has responsibility for imports to Chile and all local interaction with the government of Chile. Current estimates are that approximately 140 people will be involved in these tasks, all of whom are stationed in Chile. It is expected that many of these people will be employed under service contracts with private, Chilean, firms.

*Science Operations and Development:* This is the administrative entity responsible for all those tasks related to astronomers' use of ALMA. It includes proposal review and processing, logistics of astronomers using ALMA (whether from their office or by traveling to Chile), data quality control and verification, grant support, and scientific use of the data archive. This entity is also responsible for development of the next generation of instrumentation and software to be used on ALMA. This group is not responsible for maintenance of the operational hardware although the personnel working in advanced

development will be engaged, when necessary, in problem solving for particularly difficult operational problems as they arise.

At this point we use the guidelines mentioned above to facilitate a division of responsibilities between the partners for ALMA operations, namely: (1) respect parity; (2) build on existing institutional strengths of the partners; and (3) maximize the benefit to the partnership. In making this assignment of responsibility we note with emphasis: responsibility does not imply exclusivity. The task assignments done in recognition of the respective institutional strengths, specifically for ALMA, are coded on the organization chart. In this chart the brown color is used to indicate assignment of responsibility to ESO; the *periwinkle* (blue-gray) color represents assignment of responsibility to AUI.