

AGREEMENT
(amended on 28 February 2007)

CONCERNING THE JOINT CONSTRUCTION AND OPERATION
OF THE
ATACAMA LARGE MILLIMETER ARRAY
(ALMA)

BY

The National Science Foundation of the United States

hereinafter referred to as “NSF”,

and

The European Organisation for Astronomical Research in the Southern Hemisphere,

hereinafter referred to as “ESO” or “The European Southern Observatory”

TABLE OF CONTENTS

| | |
|---|----|
| PREAMBLE | 3 |
| ARTICLE 1: DEFINITIONS | 4 |
| ARTICLE 2: CONTRIBUTIONS | 5 |
| ARTICLE 3: OBJECTIVE | 5 |
| ARTICLE 4: SCOPE | 6 |
| ARTICLE 5: VALUATION | 6 |
| ARTICLE 6: AMENDMENT | 6 |
| ARTICLE 7: DURATION AND TERMINATION | 6 |
| ARTICLE 8: WITHDRAWAL | 7 |
| ARTICLE 9: PRECEDENCE | 7 |
| ARTICLE 10: OWNERSHIP | 8 |
| ARTICLE 11: NEW PARTICIPANTS IN ALMA | 8 |
| ARTICLE 12: BOARD | 8 |
| ARTICLE 13: EXECUTIVES | 11 |
| ARTICLE 14: JOINT ALMA OFFICE | 11 |
| ARTICLE 15: KEY PERSONNEL | 12 |
| ARTICLE 16: ALMA MANAGEMENT ADVISORY COMMITTEE | 13 |
| ARTICLE 17: ALMA SCIENCE ADVISORY COMMITTEE | 13 |
| ARTICLE 18: CHILE | 14 |
| ARTICLE 19: FINANCIAL PROVISIONS - GENERAL | 14 |
| ARTICLE 20: DEFAULT | 15 |
| ARTICLE 21: OBSERVING TIME AND DATA RIGHTS | 16 |
| ARTICLE 22: ACCESS TO OBSERVING TIME BY OTHERS | 16 |
| ARTICLE 23: INTELLECTUAL PROPERTY | 17 |
| ARTICLE 24: LIABILITY | 18 |
| ARTICLE 25: NOTICE | 18 |
| ARTICLE 26: DISPUTES | 18 |
| ARTICLE 27: ANNEXES | 19 |
| ARTICLE 28: EMPLOYMENT OF LOCAL STAFF IN CHILE | 19 |
| ARTICLE 29: RESPONSIBILITIES OF NSF AND THE NSF EXECUTIVE | 19 |
| ARTICLE 30: PAYMENTS BY ESO | 20 |

PREAMBLE

NSF and ESO (hereinafter referred to as the 'Parties'), desiring to

- contribute to global advances in understanding the physics of the Universe;
- ensure a continuing active program of astronomical research in Europe and the United States and Canada;
- encourage further scientific collaboration between the Parties, and other organizations with an interest in millimeter astronomy; and
- achieve full intellectual and economic benefits to all organizations and institutes participating in ALMA, with a fair and equitable division of responsibilities and benefits among them, consistent with their contributions and the cost-effective and timely execution of this project;

and recognizing

- the potential of large interferometric arrays operating at millimeter and submillimeter wavelengths to contribute to the study of a wide range of astronomical problems;
- the interest of the astronomical communities of Europe, the United States and Canada in developing such an array;
- the interest of other astronomical communities in participating in a large millimeter and submillimeter interferometric array project;
- the advantages of combining these aspirations in a single global project;
- the necessity to locate such an instrument at a dry, high altitude site;
- the identification of a suitable site in a region of the Altiplano in northern Chile known as Zona Chajnantor–Cerro Chascon; and
- that, by virtue of a Memorandum of Understanding (MoU) dated 10 June 1999, as amended, between NSF, the National Research Council of Canada (NRC), and ESO, with the Centre National de la Recherche Scientifique (CNRS) of France, the Max-Planck-Gesellschaft (MPG) of Germany, the Netherlands Foundation for Research in Astronomy/Nederlandse Onderzoekschool voor Astronomie (NFRA/NOVA), the Particle Physics and Astronomy Research Council (PPARC) of the United Kingdom, the Swedish Natural Science Research Council (NFR), and the Oficina de Ciencia y Tecnología and the Instituto Geográfico of Spain (OCYT/IGN), an extensive joint Design and Development program has been carried out in preparation for the construction and operation of the Atacama Large Millimeter Array project,

agree as follows:

ARTICLE 1: DEFINITIONS

“**This Agreement**” means the following Articles and Annexes, and any Amendments thereto agreed under the provisions of Article 6.

“**Assessment Point**” means the time(s) at which the Parties must decide whether or not to continue their collaboration.

“**ALMA**” means the collaborative project involving the joint Construction, Commissioning, and Operation of the Atacama Large Millimeter Array by the Parties.

“**Board**” means the Board established under Article 12.

“**Budget**” means an estimate of income, commitment and expenditure on ALMA within a specified Financial Year.

“**Commissioning**” means those activities by which the antennas and instrument systems are integrated and tested with instrumentation then available and brought into proper operation.

“**Construction**” means the planning, design, construction, and installation of antennas, infrastructure, and instrumentation.

“**Deliverables**” means the components of ALMA which have been assigned Value as set out in Annex D of this Agreement.

“**Early Operations**” refers to the scientific use of ALMA prior to the installation of the full complement of antennas and their associated instrumentation.

“**Engineering**” means the activities necessary for both the maintenance and improvement of ALMA and its instrumentation.

“**Executives**” means the entities designated under Article 13 of this Agreement to carry out the specific tasks required to construct and operate ALMA.

“**Financial Year**” means the 12-month period beginning January 1 and ending December 31.

“**Intellectual Property**” means intellectual and industrial property produced or generated during the performance of the Work which is capable of protection by patents, trademarks or copyright, and industrial design, technical information, inventions, prototypes and specifications produced or generated in the performance of the Work, which are capable of being licensed.

“**Joint ALMA Office**” means the entity established and described in Article 14 to be responsible for the overall management of ALMA Construction, Commissioning and Operations.

“**Key Personnel**” are the individuals in the positions described in Article 15, who play a central role in the Construction, Commissioning and Operation of ALMA.

“**Local Staff**” means all employees recruited and employed (by the NSF Executive) to work for ALMA under Chilean Contracts of Employment but not those employees hired to perform functions exclusively for the NSF Executive, such as, but not limited to, contracting and procurement, accounting and legal matters, etc.

“**Net Costs**” means costs incurred in connection with the employment of Local Staff, less any income received from third parties.

“**Observing Time**” means the time scheduled for the observing of astronomical objects for scientific purposes, excluding the time required for Engineering and Commissioning.

“**Operations**” means the stage after all ALMA antennas and their associated instrumentation as specified in Annex A have been fully commissioned, tested and accepted, and are operational.

“**Party**” means any signatory to this Agreement.

“**Value**” means the agreed worth of a Deliverable, expressed according to the model agreed upon by the Parties under the provisions of Article 5 of this Agreement, and as set forth in Annex D.

“**Work**” means any activity approved by the Board relating to ALMA according to the Project Description attached as Annex A, and the Work Breakdown Structure attached as Annex D.

ARTICLE 2: CONTRIBUTIONS

- 2.1 NSF and ESO will each make equal Value contributions to ALMA. To the maximum extent practicable, Work shall be fairly and equitably shared between NSF’s designated Executive and ESO.
- 2.2 The Parties, including their organizations and institutes, shall obtain intellectual and economic benefit from ALMA in all its phases in proportion to the Value of their contributions and consistent with the execution of assigned tasks on time and within budget.
- 2.3 Wherever practicable, ALMA will utilize existing institutions. Where necessary, personnel will be supplied by secondment from existing institutions. To the maximum extent possible, there shall be no exchange of funds between the Parties.
- 2.4 The Net Costs of employing Local Staff shall be shared equally between the Parties.

ARTICLE 3: OBJECTIVE

- 3.1 The objective of the Parties is to jointly carry out ALMA as a bilateral project between NSF and ESO in accordance with this Agreement and the Project Description; Science Requirements; Project Time Schedule; Work Breakdown Structure, Assignment of Deliverables, and Schedule of Values, as specified in Annexes A, B, C, and D, respectively.
- 3.2 NSF shall carry out its obligations under this Agreement subject to its applicable national laws and regulations, and ESO shall carry out its obligations under this Agreement within the framework of its Convention and statutes.

ARTICLE 4: SCOPE

This Agreement covers Construction, Commissioning, Early Operations, and Operations.

ARTICLE 5: VALUATION

- 5.1 The Schedule of Values and Assignment of Deliverables for Construction are specified in Annex D.
- 5.2 The components provided to ALMA shall be subject to common specifications and acceptance criteria. Defining, maintaining, and implementing ALMA specifications and acceptance criteria shall be the responsibility of the Joint ALMA Office.

ARTICLE 6: AMENDMENT

- 6.1 The Articles to this Agreement may be amended at any time. An amendment must specifically state the intention to amend this Agreement, and takes effect when signed and dated by the Parties.
- 6.2 The Annexes to this Agreement may be amended by the unanimous approval of the Board provided such amendment does not significantly alter the purpose of this Agreement and is consistent with the costing model agreed to by the Parties.

ARTICLE 7: DURATION AND TERMINATION

- 7.1 This Agreement shall enter into force on the date on which the last Party signs and shall expire on December 31, 2021 unless extended under Articles 7.2 and 7.3.
- 7.2 At pre-agreed Assessment Points, the Parties shall decide whether to extend this Agreement for a further period, normally of at least 5 years. In the absence of such a decision, this Agreement shall terminate on the last expiration date set.
- 7.3 The first Assessment Point shall be January 5, 2018. Subsequent Assessment Points shall be on the 5th of January at succeeding 5-year intervals unless otherwise agreed to in writing by the Parties.
- 7.4 In the event that this Agreement is terminated during Construction, Commissioning, or Operations, property shall revert to the owners as defined in Article 10.1 of this Agreement. Any additional costs or benefits shall be shared by the Parties in proportion to the Value of their contributions to ALMA up to the time at which this Agreement is terminated.

- 7.5 Before this Agreement is terminated, the Parties shall make best efforts to agree on the date and the manner in which the assets and obligations of ALMA shall be disposed of. Unless otherwise agreed, the owners of property shall be responsible for the disposal of that property. The costs or benefits arising from the disposal of jointly owned assets, including the net proceeds that may arise from the sale of such assets, shall be divided between the Parties in proportion to their contributions to those assets.

ARTICLE 8: WITHDRAWAL

- 8.1 A Party wishing to withdraw from this Agreement shall provide written notice to the other Party. If a Party gives notice of withdrawal from this Agreement, the Parties, with a view toward ensuring the continuation of the overall program, shall endeavor to reach agreement concerning the terms and conditions of the withdrawal prior to the effective date of the withdrawal.
- 8.2 The extent to which Work already completed and delivered and, where relevant, funds already paid, entitle a withdrawing Party to Observing Time after withdrawal shall be determined by the Parties prior to the effective date of the withdrawal. A withdrawing Party may not transfer any rights to Observing Time without the prior agreement of the other Party.
- 8.3 The withdrawing Party shall, at the request of the other Party, transfer, to the extent necessary for the continuation of ALMA, its right, title, and interest in any property, contracts (to the extent allowed under those contracts) or work in progress funded out of money contributed to ALMA under this Agreement to such other persons or bodies as the other Party directs and shall otherwise cooperate in order to facilitate the continuation of ALMA by the other Party.
- 8.4 The withdrawing Party shall not transfer any right, title, or interest in any property, contracts (to the extent allowed under those contracts) or work in progress funded out of money contributed to ALMA under this Agreement without the prior agreement of the other Party.
- 8.5 Notwithstanding Articles 8.2 and 8.3, a withdrawing Party shall retain its rights in Intellectual Property acquired as at the effective date of withdrawal.
- 8.6 Except as provided in Articles 8.2, 8.3, and 8.4 of this Agreement or as otherwise agreed by the Parties, all rights and benefits conferred on a Party under this Agreement shall be forfeited at the effective date of withdrawal.

ARTICLE 9: PRECEDENCE

- 9.1 This Agreement shall take precedence over all prior communications, negotiations and agreements between the Parties concerning ALMA.
- 9.2 Any inconsistency or conflict in this Agreement shall be resolved by giving precedence in the following order: Amendments (most recent first), Agreement, Annexes.

- 9.3 Neither Party shall enter into agreements concerning ALMA with third parties that conflict with the terms of this Agreement.

ARTICLE 10: OWNERSHIP

- 10.1 Deliverables supplied by NSF shall be the property of the Government of the United States. Deliverables supplied by ESO shall be the property of ESO. Intellectual property shall be subject to the provisions of Articles 8.6 and 23 of this Agreement. Material property delivered to, or developed for, ALMA shall not be disposed of, in whole or in part, during the duration of this Agreement without the written consent of all the Parties, except as allowed for in Articles 10.3 and 10.4 of this Agreement.
- 10.2 The Parties acknowledge that exports from the United States and Europe will be subject to the requirements of applicable export regulations. Such controlled exports may involve either material or intellectual property transferred from the United States or Europe to foreign countries, foreign entities or foreign nationals for the purpose of Construction, Commissioning, Early Operations, or Operations.
- 10.3 The Executives may dispose of equipment, the value of which does not exceed a limit set from time to time by the Board, subject to the said equipment being either surplus to the future requirements of ALMA or unserviceable and beyond economical repair. Initially, that limit shall be 0.1% of the total Value of ALMA as defined in Annex D. Surplus equipment shall be offered for sale to the Parties before being offered for sale elsewhere. The Executives shall use their best efforts to ensure that all proceeds realized from such sales shall be reinvested in ALMA in a manner approved by the Board.
- 10.4 Where the value of equipment identified for disposal exceeds the limit referred to in Article 10.3 of this Agreement, the Executives shall seek the approval of the Board before disposing of the equipment.
- 10.5 The Executives shall maintain a system tracking the ownership, location and, if applicable, the disposition of delivered equipment.

ARTICLE 11: NEW PARTICIPANTS IN ALMA

The Parties shall agree upon the terms and conditions through which organizations not covered by this Agreement may participate in ALMA, and shall conclude appropriate formal arrangements with such organizations before they can benefit from participation.

ARTICLE 12: BOARD

- 12.1 A Board shall be established by the Parties as a supervisory and regulatory body for ALMA, and to be the primary forum for interactions among, and decisions of, the Parties to this Agreement.

- 12.2 All decisions of the Board shall be consistent with this Agreement and with the governing laws, regulations and contractual obligations of the Parties and the Executives.
- 12.3 The Board shall not be a legal entity and shall not employ staff or hold assets.
- 12.4 The Board shall ensure that Construction, Commissioning, Early Operations, and Operations are carried out jointly in accordance with the terms and provisions of this Agreement. The Board shall exercise budgetary oversight and policy control over ALMA in accordance with the provisions of this Agreement.
- 12.5 The Board shall, *inter alia*,
- (a) review and approve the dates of completion of Construction and of Commissioning, the date of the start of Early Operations, and the date of the start of Operations;
 - (b) determine the policy and manner in which Early Operations and Operations will be carried out;
 - (c) determine the policy and procedures for the allocation of Observing Time;
 - (d) determine the policy and procedures for data rights and the proprietary period;
 - (e) require the Executives to provide the JAO with reports of expenditure and commitments on a frequency to be determined by the JAO and agreed by the Board;
 - (f) determine the format and content of planning documents and financial presentations to the Board, and each year approve a Budget for the following year;
 - (g) determine the formal documents to be produced and maintained by ALMA, and review and approve such documents, maintaining a record (attached to this Agreement at Annex F) of Documents Requiring ALMA Board Approval and the date of such approval;
- and
- (h) undertake such other duties and responsibilities to facilitate implementation of this Agreement.
- 12.6 NSF and ESO shall each appoint four members and one assessor to the Board. One member appointed by NSF shall represent the NSF Executive, and one member appointed by ESO shall represent the European Executive. ESO shall designate one of its appointees to speak on behalf of ESO and NSF shall designate one of its appointees to speak on behalf of NSF. The assessors provide advice to the Board and are entitled to participate in all Board activities but shall not vote on any matter before the Board.
- 12.7 The Board shall meet not less than two times per year.
- 12.8 Such other persons may be invited to attend meetings of the Board as the Board from time to time determines.

- 12.9 The Board shall designate one of its members as a Chairperson for a maximum period of two years, non-renewable, with a rotation between members appointed by the Parties. In the event that a Board member cannot complete a full 2-year term as Chairperson, a successor shall be designated by the Board for the remainder of the outgoing Chairperson's term.
- 12.10 The Board shall designate one of its members as Vice Chairperson for a maximum period of two years non-renewable, with a rotation between members appointed by the Parties. In the event that a Board member cannot complete a full 2-year term as Vice Chairperson, a successor shall be designated by the Board for the remainder of the outgoing Vice Chairperson's term.
- 12.11 The Vice Chairperson shall chair meetings of the Board when the Chairperson is unable to do so.
- 12.12 Neither the Chairperson nor the Vice Chairperson may be an employee of either Executive.
- 12.13 A Secretary to the Board shall be employed by the Executives to be responsible for the support of the Board including keeping records of the meetings and decisions of the Board.
- 12.14 The Parties shall advise the Secretary, in writing, of the members they have appointed to the Board and of the duration of the appointments. The Secretary shall be responsible for notifying the Chairperson, Board members, and the Parties.
- 12.15 The Parties may change their appointed members by notifying in writing the Secretary, who shall be responsible for notifying the Chairperson, Board members, and the Parties.
- 12.16 The Parties may appoint alternate members to attend and vote at specific Board meetings in place of regular members, by notifying in writing the Secretary, who shall be responsible for notifying the Chairperson, Board members, and the Parties. Alternates may not serve as either Chairperson or Vice Chairperson.
- 12.17 The Board may adopt common oversight and management activities chargeable to ALMA, and may request the Executives to arrange for the employment of staff to assist in such tasks. Expenses related to such oversight functions as may be required by an individual Party to this Agreement shall be the responsibility of that Party. Expenses for oversight and management activities undertaken at the request of the Board shall be equitably shared by the Parties.
- 12.18 The Rules of Procedure of the Board shall be drawn up by the Secretary and shall be subject to the unanimous agreement of the Board.
- 12.19 English shall be the working language of the Board and of ALMA.
- 12.20 The Parties are responsible for their own expenses incurred in pursuit of Board business by their appointees to the Board.

ARTICLE 13: EXECUTIVES

- 13.1 Two Executives shall carry out jointly the Construction, Commissioning, Early Operations, and Operations of ALMA on behalf of their respective Parties. The European Executive shall be ESO and the NSF Executive shall be Associated Universities Inc. (AUI), in its capacity as manager of the National Radio Astronomy Observatory (NRAO). NSF and ESO may change their Executives, and will notify the Board in writing of such changes.
- 13.2 Funding and Deliverables for ALMA shall be provided by the Parties through the Executives.
- 13.3 The Executives shall, *inter alia*:
- (a) receive, track, and maintain records of contributions from the Parties;
 - (b) forward such records with appropriate evaluations to the Joint ALMA Office to enable it to fulfill all reporting requirements to the Board;
 - (c) ensure that all contributions for ALMA can be examined by the Parties upon reasonable request;
 - (d) carry out the decisions of the Board and the Director;
 - (e) employ the Key Personnel and staff to carry out Work and related activities, and to issue contracts for goods and services;
 - (f) ensure that at all reasonable times representatives of the Parties have access to all Work and associated documents related to ALMA on the premises of the Executives, and to all Work at the Joint ALMA Office and its subsidiaries and at all ALMA sites within Chile; and
 - (g) report regularly to the Board as required by this Agreement, and at other times when in the judgment of the Executives such reporting is warranted.
- 13.4 When leadership and responsibility for a task are assigned to a particular Executive, they shall be exercised in cooperation with the other Executive.

ARTICLE 14: JOINT ALMA OFFICE

- 14.1 The Board shall establish a Joint ALMA Office and shall provide through the Executives the necessary funding, infrastructure and personnel support to operate the Joint ALMA Office.
- 14.2 The Joint ALMA Office shall be headed by the Director and shall be comprised of the Key Personnel plus such other staff as are required to carry out the functions of the Joint ALMA Office. The Executives shall employ, or arrange for the employment of the staff of the Joint ALMA Office, including the Key Personnel.

- 14.3 The Joint ALMA Office shall *inter alia*, through the Director,
- (a) be responsible for the overall leadership and management of joint Construction, Commissioning, Early Operations, and Operations, which shall be carried out in accordance with the terms and provisions of this Agreement;
 - (b) define, maintain, and apply specifications and acceptance criteria for Deliverables. In the event that Deliverables fail to meet acceptance criteria, the Joint ALMA Office shall notify the responsible Party and the Board, and shall devise a recovery plan for the approval of the Board.
 - (c) propose a draft annual Budget to the Board in the format agreed by the Board and on a schedule agreed by the Board;
- and
- (d) provide for the Board quarterly reports of the status, including detailed financial status, of ALMA in accordance with the requirements of the Board.

In addition, the JAO may provide strategic advice to the Board on all matters concerning ALMA and its role in furthering world astronomy.

ARTICLE 15: KEY PERSONNEL

- 15.1 The organizational structure of ALMA shall be subject to the review and approval of the Board, and Key Personnel shall be designated from time to time by the Board.
- 15.2 The Key Personnel comprise
- (a) The **Director**: responsible for leading ALMA. He/she reports to the Board.
 - (b) Such other staff as may be so designated by the Board upon proposal by the Director. These staff report to the Director.
- 15.3 Key Personnel shall be selected through an open, world-wide search carried out jointly by the Executives in a manner approved by the Board. The job descriptions and appointment of all Key Personnel shall be subject to the unanimous approval of the Board.
- 15.4 The Director shall be responsible for the efficient and effective operation, and for the discharge of the responsibilities of, the Joint ALMA Office. The Director shall be responsible for the Project Time Schedule and Work Breakdown Structure, and for the maintenance of the Schedule of Values and Assignment of Deliverables as set out in Annexes C and D.
- 15.5 In consultation with the Executives, and with Board approval if the Value concerned exceeds \$1 million or €1 million, the Director may change the Project Time Schedule and Work Breakdown Structure, and the Schedule of Values and Assignment of Deliverables while maintaining parity of Value in the contributions of the Parties.
- 15.6 The Director shall allocate Observing Time during Early Operations and Operations in accordance with policies and procedures determined by the Board.

- 15.7 The job performance of all Key Personnel shall be reviewed annually by the Board in consultation with the Director and the Executives. Board approval will be required for the continued appointment of all Key Personnel.
- 15.8 The Director may, in consultation with the Executives, define specific staff positions in ALMA which require the Director's approval prior to appointment.

ARTICLE 16: ALMA MANAGEMENT ADVISORY COMMITTEE

- 16.1 The Board shall establish an ALMA Management Advisory Committee (AMAC) to provide advice on those major issues presented to the AMAC by the Board regarding the technical program, cost, and management of the ALMA Project, including the management of specific tasks and resources. The Parties shall each appoint up to five members to the AMAC; such appointments require the concurrence of the Board. Members shall serve for a term of 3 years, but may be reappointed for a second term.
- 16.2 New participants who join ALMA under the provisions of Article 11 may, at the sole discretion of the Parties, be invited to appoint observers to AMAC under terms which shall be agreed under Article 11.
- 16.3 The AMAC shall be kept informed of progress and developments in ALMA through periodic reports and briefings provided by the Joint ALMA Office, and shall meet as required by the Board, normally once per year. Reports of the AMAC's deliberations shall be made in writing to the Board by the Chairperson of the AMAC following each Committee meeting, on a schedule specified in advance by the Board.
- 16.4 The Chairperson of the AMAC shall be selected by the members of the AMAC from the membership and shall normally respect the principle of rotation among members appointed by the Parties. The selection of the Chairperson shall be subject to the concurrence of the Board.

ARTICLE 17: ALMA SCIENCE ADVISORY COMMITTEE

- 17.1 The Board shall establish an ALMA Science Advisory Committee (ASAC) to advise the Board on those major issues presented to the ASAC by the Board that affect the science capabilities of ALMA and require decisions to be made or priorities to be set regarding project tasks and resources. ESO shall appoint up to five ASAC members and NSF shall appoint up to five ASAC members; such appointments to require the concurrence of the Board. Each member shall serve a term of 3 years. Members may be reappointed for a second term.
- 17.2 New participants who join ALMA under the provisions of Article 11 may, at the sole discretion of the Parties, be invited to appoint members and/or observers to ASAC under terms which shall be agreed under Article 11.

- 17.3 The ASAC shall be kept informed of progress and developments in ALMA through periodic reports and briefings provided by the Joint ALMA Office and shall normally meet twice a year. Reports of the ASAC's deliberations shall be made in writing to the Board by the Chairperson of the ASAC following each Committee meeting, on a schedule specified in advance by the Board.
- 17.4 The Chairperson of the ASAC shall be selected by the members of the ASAC from the membership and shall normally respect the principle of rotation among members appointed by the Parties. The selection of the Chairperson shall be subject to the concurrence of the Board.

ARTICLE 18: CHILE

In accordance with the agreement between ESO, the NSF Executive, and CONICYT of Chile, ten percent of the ALMA Observing Time will be set aside each year for Chilean astronomy. The procedure for allocation of this time shall be decided by the Chilean astronomical community, in consultation with the ALMA Board and Director, prior to the initiation of ALMA scientific operations. In addition, CONICYT may appoint

- (a) one Chilean member to the ALMA Board, with the right to vote in all matters except those which involve budgetary obligations of the Parties, specific issues concerning the incorporation of new members in the ALMA partnership, or relations between ALMA and the Republic of Chile;
- (b) one Chilean observer to AMAC;
- (c) one member of the Chilean astronomical community to participate in ASAC with right to vote on all matters.

ARTICLE 19: FINANCIAL PROVISIONS - GENERAL

- 19.1 The Parties intend that the funds that they will set aside and obligate from time-to-time to ALMA will meet their obligations under this Agreement. However, it is recognized that the Parties must operate within the constraints of the funding made available by national governments and funding agencies. Therefore, the obligations under this Agreement are subject to the availability of appropriated funds.
- 19.2 Financial matters before the Board as set out in this Article shall require the agreement of six of the Board members, including both the ESO and NSF designated members of the Board.
- 19.3 The Financial Year of ALMA shall be the calendar year (January 1 through December 31).
- 19.4 Board approval is required for the annual Budget proposed by the Director.

- 19.5 NSF and ESO shall arrange for an external review of their respective Executive activities at intervals of not less than three years, and shall make the results of these reviews available to the Parties through the Board.

ALMA Board expenses

- 19.6 A Party hosting a meeting of the Board shall be responsible for the local costs of arranging the meeting.

Contracts and Contingency

- 19.7 The Executives shall, to the maximum extent practicable, make sub awards on the basis of competitive international tender in a manner which shall enable competitive bidding by companies within the respective Parties' countries on terms which are not selectively to the disadvantage of the companies of any of those countries. Such awards shall be subject to external audit, the results of which shall be reported to the Board.
- 19.8 The Executives shall notify the Board in advance through the Director of the intention to place any contract valued above \$1,000,000 or €1,000,000. The Executives shall notify the Board in advance through the Director of the intention to issue an invitation to tender for a contract provisionally valued above \$10,000,000 or €10,000,000.
- 19.9 The Director's approval shall be required for the placing of any contracts above \$500,000 or €500,000.
- 19.10 The placing of any contract above \$10,000,000 or above €10,000,000 shall require the recommendation of the Director and the concurrence of the Board.
- 19.11 The Director's approval shall be required for the use of contingency in excess of \$500,000 or €500,000 by the Executives. Board approval shall be required for the use of contingency in excess of \$1 million or €1 million.

Observing

- 19.12 Funding of the travel and subsistence costs of observers or others wishing to use ALMA is outside the scope of this Agreement.

ARTICLE 20: DEFAULT

- 20.1 An Executive which expects to default on an obligation for a Deliverable, either through late delivery, failure to meet specification, or any other cause, shall immediately inform the Director and the Board through the Secretary in writing, together with an explanation of the causes and proposed actions to be taken. The Director shall provide the Board through the Secretary with an evaluation of the likely consequences of such default, and advise the Board of the actions the Director intends to take to minimize the impact on ALMA. The Secretary shall also pass this information to the Executives and the Parties. In consultation with the Parties, the Chairperson shall decide whether Board approval for such actions is required, and how such approval should be obtained.

- 20.2 The Director may recommend to the Chairperson that the Board establish a mechanism to revise the Value of the Deliverable, and may propose any compensatory action, including cash payments and a readjustment of Observing Time, taking into account the proposed remedial action and its impact on the Executives, the Parties and on ALMA, so that the Board may take such steps as are necessary to ensure that the terms of Article 2 of this Agreement are maintained.
- 20.3 The Director shall immediately implement such steps as shall be agreed by the Board.
- 20.4 An Executive which is in default for more than 360 calendar days during Operations shall be considered as having signaled the intent of the corresponding Party to withdraw from ALMA and the relevant provisions of Article 8 of this Agreement shall apply.

ARTICLE 21: OBSERVING TIME AND DATA RIGHTS

- 21.1 The Director may propose incentives for enhanced performance by the Executives to the Board for approval. The award of Observing Time during Early Operations may be used as such an incentive.
- 21.2 The Observing Time available to the Parties during Operations shall be divided between them in equal shares, and distributed equitably according to the seasons of the year.
- 21.3 The Executives shall arrange for the maintenance of a log and an archive copy of each observation and its relevant calibration data in a single, uniform data format accessible to qualified researchers as approved by the Board. For this purpose, the Executives may choose to employ mirrored data sites for the convenience of their respective user communities.
- 21.4 The Board shall set policies for proprietary time, data storage, archiving, access, and subsequent use by the astronomical community. The rules relating to Observing Time and data rights shall be reviewed periodically by the Board.
- 21.5 Any observer who takes data with ALMA shall have exclusive use of that data for 12 months after the collection of the data has been completed. Thereafter, the data shall become available to any qualified researcher in accord with a policy approved by the Board.

ARTICLE 22: ACCESS TO OBSERVING TIME BY OTHERS

- 22.1 Either Party may, with the written agreement of the other, assign its Observing Time, in whole or in part, for a fixed period of time, to another entity not a Party to this Agreement. Agreement to such assignments, which must be in accordance with this Agreement, shall not be unreasonably withheld, delayed or denied.
- 22.2 Third parties receiving the assignment of Observing Time under Article 22.1 of this Agreement shall be expected to abide by all rules pertaining to ALMA Operations and data release.

ARTICLE 23: INTELLECTUAL PROPERTY

- 23.1 Except as provided in Articles 21.3 through 21.5 of this Agreement concerning data acquired with ALMA, the inventor or creator of Intellectual Property or his or her assignee or employer shall own or have the option to own all Intellectual Property arising out of the Work done pursuant to this Agreement.
- 23.2 Subject to Article 23.6 of this Agreement, for all Intellectual Property created during Work under this Agreement, the appropriate Executive shall provide and obtain a non-exclusive, non-transferable, irrevocable, paid-up license (1) for use in ALMA and (2) for each of the Parties to use or have used on their behalf throughout the world for non-commercial research purposes of any such Intellectual Property.
- 23.3 The provisions of any NSF Award in connection with this Agreement, to AUI or any successor organization supporting the operations of the NRAO will, if applicable, contain the patent right provisions required by relevant U.S laws such as Chapter 18 of Title 35, United States Code, including a requirement as authorized by 35 USC 202 (c) (4) that the organization managing the NRAO provide or obtain, in addition to the license rights of the United States, a non-exclusive, nontransferable, irrevocable, paid-up license for ESO to practice or have practiced on their behalf throughout the world for research purposes any subject inventions. The license rights which the organization managing the NRAO will obtain for the United States under sub awards or other arrangements with persons or organizations from the ESO countries shall be limited to a non-exclusive, nontransferable, irrevocable, paid-up license for NSF to practice or have practiced on its behalf for research purposes any subject inventions created during Work under this Agreement. NSF or its appointed Executive shall provide corresponding license rights to ESO.
- 23.4 Arrangements made by the Executives for the undertaking of research or development work for ALMA may involve funding agreements that are not subject to Article 23.3 of this Agreement. The provisions of the NSF Award to AUI or any successor organization managing the NRAO, or provisions applied by ESO, will contain terms and conditions designed to assure the identification and reporting of inventions on a basis comparable to that contemplated under Article 23.3 of this Agreement and the granting of licenses to all affected Parties by the owner of the inventions that are substantially the same as those required for non-US Parties under Article 23.3 of this Agreement. When arrangements involving its employees are made that are subject to this Article, the Party will have to enter into appropriate arrangements with the appropriate Executive to accomplish the intent of this Article.
- 23.5 In the case of scientific or technical papers, reports, books or similar materials (whether in print or electronic form) prepared by the Executives or their sub awardees and provided to the Parties or the Board, each Party shall be free to translate, reproduce and publicly distribute such materials, subject to any restrictions which may be placed on the document pursuant to Article 23.6 of this Agreement, or restrictions which are necessary to obtain appropriate protection of intellectual property rights in particular patents.

- 23.6 The Parties recognize that in some cases the Executives or their sub awardees may have to obtain goods or services from organizations that limit the uses made of certain technical data, software, know-how, or other information provided to the Executives or their sub awardees because the organization providing the data, software, know-how or other information treats it as proprietary or trade secret or otherwise restricts its use. This is likely to be particularly true where pre-existing technical data or software is involved. In such cases, the Parties recognize that it may not be cost-effective or possible for the Executives or their sub awardees to obtain license rights for the Parties of the type contemplated by Articles 23.2 and 23.5 of this Agreement and do not expect the Executives or their sub awardees to obtain such rights in such cases, provided that whatever license rights are obtained should be the same for both the Parties.

ARTICLE 24: LIABILITY

- 24.1 The Parties will ensure that the Executives procure and maintain for their own benefit, and at their own cost, comprehensive general liability insurance, as appropriate.
- 24.2 An Executive or Party sending information, materials, or supplies to another Executive, Party or Parties under this Agreement shall not be liable for damages of any nature, direct or indirect, to property of the Executive, Party or Parties receiving the information, materials, or supplies, or to any third party resulting from the use by the Executive, Party or Parties of the information, materials, or supplies received.

ARTICLE 25: NOTICE

Any notice contemplated by this Agreement, unless a different address is subsequently notified by one Party to the others in writing, must be sent to the addresses stated in Annex E to this Agreement, and copied to the Secretary to the Board, by either

- (a) certified mail or courier, and then it is considered to have been received ten days after it is sent; or
- (b) electronic mail or facsimile, and then it is considered to have been received only when acknowledged by letter or facsimile.

ARTICLE 26: DISPUTES

The resolution of any disputes regarding the interpretation, implementation or application of this Agreement shall be sought by consultation between the Parties. Should such consultation fail, the matter shall be put to the Director of the National Science Foundation and the President of the ESO Council for resolution.

ARTICLE 27: ANNEXES

The following Annexes shall form an integral part of this Agreement:

- (a) Annex A: Project Description
- (b) Annex B: Scientific Requirements
- (c) Annex C: Project Time Schedule
- (d) Annex D: Work Breakdown Structure, Assignment of Deliverables and Schedule of Values
- (e) Annex E: Addresses of Parties and Board Members
- (f) Annex F: Documents Requiring ALMA Board Approval

ARTICLE 28: EMPLOYMENT OF LOCAL STAFF IN CHILE

The NSF Executive, as provided for and defined in Article 13 of the Agreement, shall be the sole employer of Local Staff in Chile.

ARTICLE 29: RESPONSIBILITIES OF NSF AND THE NSF EXECUTIVE

NSF shall require the NSF Executive to:

- 29.1 Affirm to the Parties that it has immunities, prerogatives, privileges and facilities in Chile in all matters relevant to this Amendment and in particular in matters arising out of the employment of the Local Staff, granted to the NSF Executive by the Government of Chile in accordance with Law 15.172 as amended and any relevant subsequent legislation.
- 29.2 Comply with and conform to the requirements of Chilean Law 15.172 as amended, in particular those portions of Law 15.172 applicable to the employment of Local Staff.
- 29.3 Be solely responsible for all interactions with the Chilean Government on issues exclusively related to or arising from the Contracts of Employment of Local Staff.
- 29.4 Consult and obtain the concurrence of ESO and the JAO on all policy matters concerned with the employment of Local Staff.
- 29.5 Accept full and exclusive liability for payment of any and all contributions or taxes which are measured by wages, salaries, or other remuneration paid to the Local Staff under the Contracts of Employment or which arise by virtue of their employment and which are imposed by the Government of Chile or its agency.

- 29.6 Make such expenditure and incur such commitments as are required for the employment of the Local Staff, and report on such expenditure and commitments to the Parties on such a schedule as may be mutually agreed with the Parties from time to time.
- 29.7 Complete, implement, and maintain a Management Agreement with ESO concerning the employment of Local Staff and other ALMA matters.

ARTICLE 30: PAYMENTS BY ESO

- 30.1 ESO agrees to pay for its share of Net Costs within 30 days of the receipt of an invoice presented by the NSF Executive. Invoices shall be presented to ESO on a schedule to be agreed between ESO and the NSF Executive. Such payments are agreed by the Parties to constitute remuneration for services provided by the NSF Executive and shall not be construed as establishing any employment relationship between Local Staff and ESO.
- 30.2 Invoices shall be presented by the NSF Executive, and payments shall be made by ESO to the NSF Executive, in the currency in which the NSF Executive expends the funds.

**For the National
Science Foundation
of the United States:**

**For the European
Organisation for
Astronomical Research in
the Southern Hemisphere:**

Arden Bement, Jr.

C. Cesarsky

Arden Bement, Director
National Science
Foundation

Catherine Cesarsky
Director General, ESO

3/30/07

5/25/07

Date

Date

Washington, DC.

Munich

Place

Place