

**Study Proposal**

**[Insert Title]**

**PRINCIPAL INVESTIGATOR**: [Insert Name]

INSTITUTION: [Insert]

ADDRESS: [Insert]

PI CONTACT INFORMATION:

*Telephone Number:* [Insert]

*Email Address:* [Insert]

Development Upgrades

of the

Atacama Millimeter/submillimeter Array (ALMA)

**Abstract**

Present a one-page (or less) description of the work scope and objectives of the study with emphasis on its scientific merits. If applicable, please include a description of prototype hardware and/or software that will result from the study.

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# Co-investigator(s) and collaborating institution(s)

Insert/delete rows as needed. It is up to the PI to decide who needs to be explicitly listed but at least one person from every represented institution must be listed.

Table 1‑1: Co-Investigator(s) and Collaborating Institution(s)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Institution** | **Email** | **Telephone** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

# Subcontractors

## [Company/Institution]

**Address**:

**Subcontracted parts or services**:

Obtain Company and/or Institution authorization to be proposed as a subcontractor prior to completion and sign-off of this Proposal.

# Science Case

Present the scientific rationale for the proposal and its significance to ALMA. Explain how the science case is aligned with the priorities of the ALMA Development roadmap including increasing improved receiver performance in priority bands, increased receiver bandwidth, and enhanced usability of the science archive and/or data analysis and science products.

# Scope

Insert an explanation of the scope/scale and planned method of the proposal. Describe proposal objectives, technical details, assumptions, working theories, and approaches that will be used, and state hypothesis.

# Broader impacts Plan

The National Radio Astronomy Observatory is committed to broadening the impact of its research and development activities.

Broader Impacts (BI) are not required for Studies due to their short duration and thus, you may not request funds specifically for this purpose. However, if the study naturally includes BI aspects, briefly discuss here how the proposed development study will lead to benefits to society beyond the intrinsic scientific merit.

Please note that unrelated activities pursued by parent organizations do not count. The Broader Impacts described here should be specific to activities that will be carried out during the period of the development proposal, by participants in the proposal.

# Period of Performance

Define the anticipated period of performance. Studies are expected to last no more than 1 year, also please note that each Study will be limited to at most one 6-moth No Cost Extension upon request except in exceptional circumstances.

# Schedule

|  |
| --- |
| ***Insert Schedule (Gantt Chart) Here******Resize Area as Required***  |

Figure 7‑A: Proposed Schedule

# Plan Deliverables

Describe the products (prototype, software, etc) that will be delivered at the conclusion of the proposed Study. At minimum a close-out report must be submitted that describes the Study and outcome(s) suitable for public distribution (it will be posted on the NA Development Website), see Section 8.4.

## Hardware

[Text/bullets/subsection]

## Software

[Text/bullet/subsection]

## Services

[Text/bullet/subsection]

## Documents

* Closeout Report (note that the report will be made public by posting it to the NA ALMA Development Website)

# Interfaces to ALMA

Note the ALMA hardware and/or software control interfaces that may be affected if the proposed design or control scheme is implemented.

# Implementation

## Planned Implementation at ALMA

*If Applicable. It is very unusual for a Study to merit implementation at ALMA.*

Describe how the proposal deliverables will be provided to the end-user and how on-site Implementation, Verification, and Commissioning will be achieved. Ensure that nonrecurring (implementation) and recurring costs are accounted for in the proposal cost estimate.

## Site Location Impact Statement

*If Applicable.*

Describe any new facilities, significant modifications to existing facilities, or use of NRAO facilities that are required. Also indicate when these facilities and/or modification are required.

## Implementation Schedule

|  |
| --- |
| ***Insert implementation Schedule (Gantt Chart) Here*** |

Figure 10‑A: Implementation Schedule

# Staffing

NA ALMA Program Manager support is available upon request if there are questions filling out this portion of the proposal.

Estimate the level of effort (unit of measure = Full Time Equivalent) to be deployed. Identify essential (key) personnel required to ensure success. If two, or more, persons of equivalent labor grade are capable of performing any given task, leave the corresponding Key Personnel cell blank and note the FTE level of effort only. Key Personnel listed also need to provide their CVs in Appendix A.

## Offeror’s Staffing

Table 11‑1: Labor Estimate

|  |  |  |
| --- | --- | --- |
| **Title (examples)** | **Key Personnel** | **FTE** |
| Principal Investigator |  |  |
| Scientific Lead |  |  |
| Engineering Lead |  |  |
| Research Engineer |  |  |
| Senior Engineer |  |  |
| Engineer 1 |  |  |
| Technician 1 |  |  |
| Machinist |  |  |
| Other |  |  |
| ***Totals*** |  |

## External Staffing *(if applicable)*

*Insert/delete rows as needed. All collaborators, including unfunded and in-kind contributors, must be listed below*.

Table 11‑2: External Staffing and Contact Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Title** | **Name** | **Institution** | **Email** | **Telephone** |
| Co-Investigator |  |  |  |  |
| Vendor Point of Contact |  |  |  |  |
| Customer Point of Contact |  |  |  |  |

# Project Management

## Systems/Configuration Control

### Systems Requirements and Specification Control

Refer to INCOSE Systems Engineering Handbook (INCOSE-TP-2003-002-04).

Development engineering and design activities shall be conducted in accordance with established Systems Engineering policies, practices, and procedures.

### Documentation Control

Define your approach.

All shared documents shall be dated and bear a revision level number.

### Product & Quality Assurance Control

Refer to ALMA Product Assurance Requirements (ALMA-80.11.00.00-001-E-GEN). A unique Product Assurance Plan is unnecessary.

Development engineering and design activities shall be conducted in accordance with established ALMA PA/QA policies, practices and procedures.

## Performance to Schedule

The Principal Investigator has primary responsibility for schedule development and performance to schedule. The NA ALMA Development Program Office will, if requested, provide support to the PI in establishment of a revision-controlled Schedule and monthly preparation of performance to schedule status. In the event of a schedule variance, the PI and the NA ALMA Development Program Manager will assess the impact and develop the appropriate recovery action(s).

## Performance to Budget

The Principal Investigator has primary responsibility for intra-proposal budget allocation and cost performance. The NA ALMA Development Program Office, if requested, will provide support to the PI in establishment of cost accounts, budget load, and the preparation of a revision-controlled, monthly Budget Status Report. In the event of a cost variance, the PI and the NA ALMA Development Program Manager will assess the impact and develop the appropriate recovery action(s).

## Measure of Success

Describe the measures of success (performance metrics and outcomes) for this proposal. Describe the process that will be used to address experiment prioritization, evaluate experiment results, and to modify the approach/redirect experiments. Include an assessment of the likelihood that the proposed method and approach to the Study will further the state of the art. Describe the process that will be used to manage Change Control.

## Risk Management

Identify the primary areas of uncertainty (risk) foreseen at the outset of the proposal. Estimate the probability of occurrence and associated cost impact of each identified risk. Also, briefly note the means by which each primary risk may be mitigated or retired altogether.

## Communication Plan and Progress Reporting

A monthly Progress Report shall be prepared by the Principal Investigator in accordance with NRAO Program Management practices and procedures. Informal reviews will be conducted by the NA ALMA Development Program Manager upon the completion of milestones.

# Cost Breakdown

NA ALMA Program Manager support is available upon request if there are questions filling out this portion of the proposal. Provide all figures in US Dollars.

## Offeror’s Cost

*Work Breakdown Structure (WBS) Number should correspond to Level 1 tasks/activities in the proposal Schedule. Insert rows as needed*

Table 13‑1: Offeror's Cost

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **WBS No.** | **Task Description** | **Labor ($)** | **Materials & Services ($)** | **Travel ($)** |
| 1.0 |  |  |  |  |
| 2.0 |  |  |  |  |
| n.0 |  |  |  |  |
| ***Subtotals ($)*** |  |  |  |
| ***Total Offeror’s Cost ($)*** |  |

Table 13‑2: Total Offeror's Cost Breakdown

|  |  |  |
| --- | --- | --- |
| **Total Direct ($)** | **Total Indirect ($)** | **Indirect Cost Rate (%)** |
|  |  |  |

## Collaborating Institution / Subcontractor Cost

*Insert rows as needed. Note the value of any In-Kind Contributions*.

Table 13‑: Collaborating Institution/Subcontractor Cost & In-Kind Contribution

|  |  |  |
| --- | --- | --- |
| **Collaborating Institution / Subcontractor** | **Subaward ($)** | **In-Kind Contribution ($)** |
|  |  |  |
|  |  |  |
| ***Total Cost ($)*** |  |  |
| ***Total In-Kind Contributions ($)*** |  |  |

Table 13‑4: Subaward Cost Breakdown

|  |  |
| --- | --- |
| **Subaward Direct ($)** | **Subaward Indirect ($)** |
|  |  |

## Total Cost

Table 13‑5: Total Cost

|  |  |
| --- | --- |
| **Elements** | **Cost ($)** |
| Total Offerer’s Cost |  |
| Collaborating Institution / Contractor Total Cost  |  |
| ***Total Cost ($)*** |  |

## Total Value

Table 13‑6: Total Value

|  |  |
| --- | --- |
| **Proposal Elements** | **Cost ($)** |
| Total Cost (from Table 13-5) |  |
| Offerer / Collaborating Institution / Contractor Total In-Kind Contributions |  |
| ***Total Value ($)*** |  |

# Closeout

Upon conclusion, the NA ALMA Development Program Office will coordinate the orderly closeout of activities; or, the transition of activities to a continuing Study/Project. At a minimum, this will include the following:

* verification of compliance with established procurement policies and procedures;
* verification of Purchase Order final payments;
* verification of compliance with established labor charging practices;
* verification of labor charging accuracy;
* cost and schedule variance analysis;
* resolution of inventory or property control issues;
* inactivation of cost accounts;
* preparation of a Final Report; and
* archiving of records

# Commitment

Having read all documents listed in and annexed to the Call for Development Proposals, and having assessed the situation and the nature and difficulties of the proposed services, the undersigned hereby offers the **[insert Title here]** in accordance with the provisions of the present Call for Development Proposals and, if awarded the Agreement, undertakes to carry out the work required according to best trade practices, within the prescribed time limits, and at the price set out in this Proposal.

|  |  |
| --- | --- |
| **Name:** |  |
| **Institution:** |  |
| **Signature:** |  |
| **Date:** |  |

# APPENDICES

## APPENDIX A - Reference Documents

## APPENDIX B – Curriculum Vitae of Key Personnel

*CV should be no more than two pages per person.*

## APPENDIX C – Allocation Rates