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North American  
ALMA Science  
Center



## Development Upgrades of the Atacama Large Millimeter/submillimeter Array (ALMA)

### **NRAO Study Plan -Template**

<b>Prepared by</b>	<b>Organization</b>	<b>Date</b>
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<b>Approvals (Name and Signature)</b>	<b>Organization</b>	<b>Date</b>
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W. Randolph	NA ALMA Dev. Program	

### **Change Record**

<b>Version</b>	<b>Date</b>	<b>Reason</b>
0.0	01 May 2013	Initial Release

**Delete this entire page from your submitted Study Proposal.**



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## Development Upgrades of the Atacama Large Millimeter/submillimeter Array (ALMA)

### **NRAO STUDY PLAN**

*Insert **TITLE** here*

**PRINCIPAL INVESTIGATOR:**

INSTITUTION:

ADDRESS:

PI CONTACT INFORMATION:

*Telephone Number*

*Email address*

**ABSTRACT**

*Present a one page (or less) description of the work scope and objectives of the proposed Study.*

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## **1.0 SCIENCE CASE**

*Present the scientific rationale for the proposed Study and the significance for ALMA.*

## **2.0 STUDY DELIVERABLES**

*Describe the products that will be delivered at the conclusion of the proposed Study.*

### **2.1 Hardware:**

### **2.2 Software:**

### **2.3 Services:**

### **2.4 Documents:**

- Monthly “4-square” Progress Reports
- Final Report
- Outcomes Report

## **3.0 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.*

## **4.0 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.*

## **5.0 PROGRAM OPERATING PLAN IMPACT**

*Describe impact(s) in terms of reduced labor and/or facilities capacity within the proposed period of performance.*

## **6.0 PERIOD OF PERFORMANCE**

*Define the anticipated period of performance (**twelve months maximum**).*

## **7.0 STAFFING**

*Estimate the level of effort (unit of measure = Full Time Equivalent) to be deployed by the NRAO until completion of the proposed Study. Identify essential (key) NRAO 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.*

**7.1 NRAO Staffing:**

Complete Table 1.0, below.

*Table 1.0; NRAO Labor Estimate.*

<b>Title</b>	<b>Key Personnel (leave blank if inapplicable)</b>	<b>FTE</b>	<b>Duration (Months)</b>
Principal Investigator			
Scientific Lead			
Engineering Lead			
Sr. Research Engineer			
Research Engineer			
Sr. Engineer			
Engineer 1			
Engineer 2			
Engineer 3			
Technician 1			
Technician 2			
Technician 3			
Machinist			
Other			
<b>TOTAL FTEs</b>		<b>0.00</b>	

**7.2 External Staffing:**

Complete Table 2.0, below.

*Table 2.0; External Staffing and Contact Information.*

<b>Title</b>	<b>Name</b>	<b>Institution</b>	<b>Email</b>	<b>Telephone</b>
Co-Investigator				
Vendor point of contact				
Customer tech. point of contact				

## 8.0 COST BREAKDOWN

The total Award Pool for the FY2014 Call for Development Study Proposals is \$1.0M. The total Award Pool amount (\$1.0M) will fund all NA ALMA Partnership Study Proposals. **The maximum cost allowance for an individual Study Proposal is \$200K.**

### 8.1 NRAO Cost:

Complete Table 3.0, below. Work Breakdown Structure (WBS) Number should correspond to Level 1 tasks/activities in the Study schedule. Insert additional rows as required.

Table 3.0; **NRAO Cost Breakdown.**

WBS No.	Task Description	Labor (\$)	Materials & Services (\$)	Travel (\$)
1.0				
2.0				
3.0				
4.0				
5.0				
6.0				
7.0				
8.0				
9.0				
10.0				
n.0				
<b>SubTotals (\$)</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
		<b>TOTAL COST (\$)</b>		<b>0.00</b>

### 8.2 Collaborating Institution / Subcontractor Cost:

Complete Table 4.0, below. Insert additional rows as required. Note the value of any In-Kind Contributions.

**Table 4.0; Collaborating Institution / Subcontractor Cost.**

<i>Collaborating Institution / Subcontractor</i>	<i>USD (\$)</i>	<i>In-Kind Contribution Value in USD (\$)</i>
<b>TOTAL COST (\$)</b>	<b>0.00</b>	
<b>TOTAL VALUE of IN-KIND CONTRIBUTIONS (\$)</b>		<b>0.00</b>

**8.3 Total Cost:**

Complete Table 5.0, below.

**Table 5.0; Total Study Cost.**

<i>Study Participants</i>	<i>USD (\$)</i>
NRAO Total Cost (Table 3.0)	
Collaborating Institution / Subcontractor Total Cost (Table 4.0)	
NRAO Study Contingency (reference Table 7.0)	
<b>Total Cost of Study (\$)</b>	<b>0.00</b>

**8.4 Total Value:**

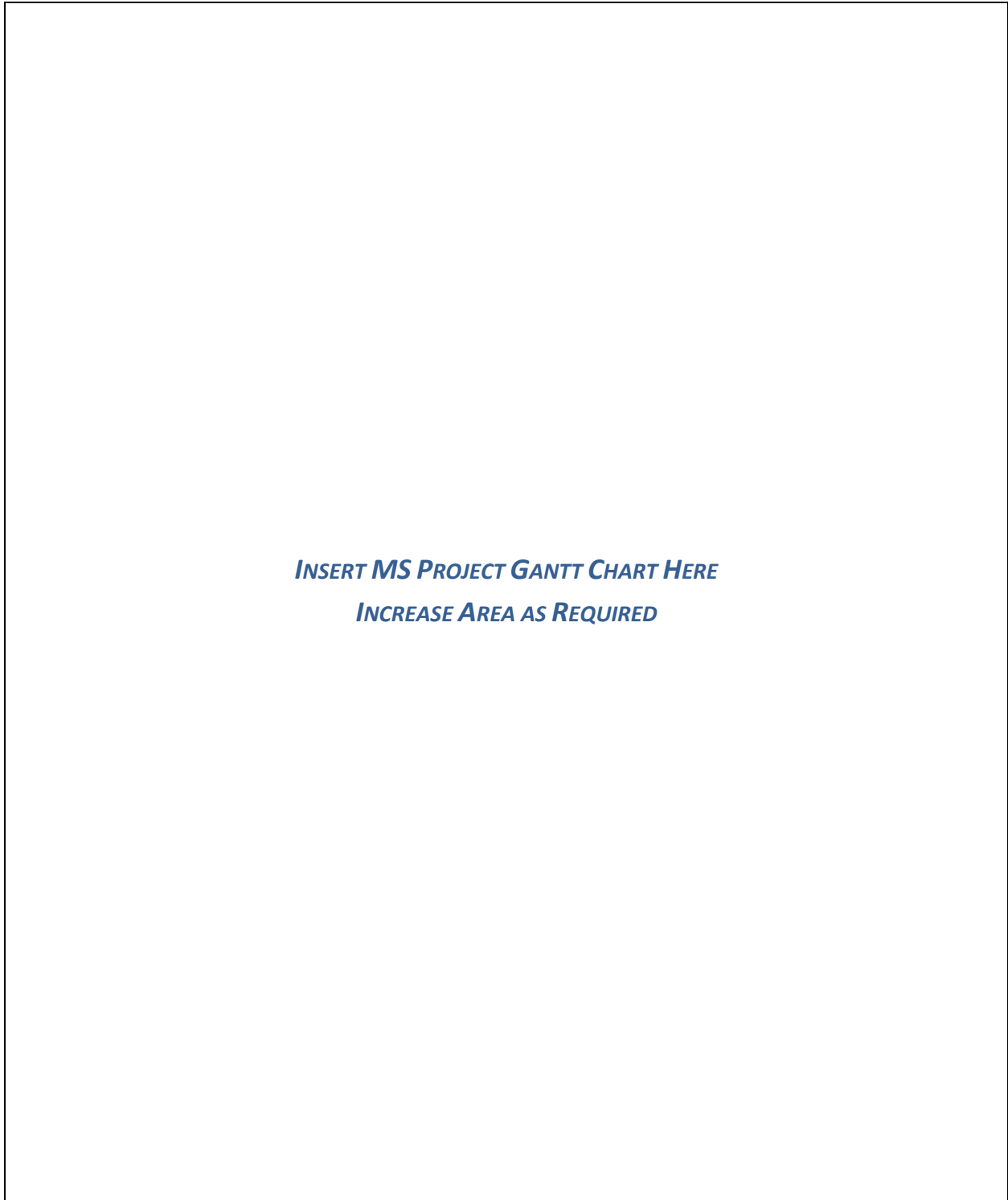
Complete Table 6.0, below.

**Table 6.0; Total Study Value.**

<i>Category</i>	<i>USD (\$)</i>
Total Cost of Study (Table 5.0)	
Total Value of In-Kind Contributions (Table 4.0)	
<b>Total Value of Study (\$)</b>	<b>0.00</b>



## 9.0 SCHEDULE



*Figure 1.0; Study Schedule.*

## **10.0 STUDY MANAGEMENT**

### **10.1 Systems/Configuration Control**

#### *10.1.1 Systems Requirement and Specification Control*

Development engineering and design activities will be conducted in accord with established ALMA Systems Engineering policies, practices and procedures.

#### *10.1.2 Documentation Control*

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

#### *10.1.3 Product & Quality Assurance Control*

Development engineering and design activities will be conducted in accord with established ALMA PA/QA policies, practices and procedures. A unique Product Assurance Plan is unnecessary.

### **10.2 Performance to Schedule**

The Principal Investigator has primary responsibility for schedule development and performance to schedule. The NA ALMA Development Program office will provide support to the PI in establishment of a revision-controlled Study 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).

### **10.3 Performance to Budget**

The Principal Investigator has primary responsibility for intra-study budget allocation and cost performance. The NA ALMA Development Program office 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).

### **10.4 Measures of Success**

*Describe the measures of success (performance metrics and outcomes) for this Study. Describe the process that will be used to address experiment prioritization, evaluate experiment results, and to modify the approach/redirect experiments.*

### **10.5 Risk Management**

*Identify the primary areas of uncertainty (risk) foreseen at the outset of the Study. Estimate the probability of occurrence and associated cost impact of each identified risk. Total estimated cost impact should guide the Proposers' calculation of contingency funds (reference Table 5.0, **Total Study Cost**). Also, briefly note the means by which each primary risk may be mitigated or retired altogether.*

*Table 7.0; Study Risk Assessment.*

No.	Primary Risk(s)	Prob. (%)	Impact (\$)	Mitigation
1				
2				
3				
<b>Total Cost Impact (\$)</b>			<b>0.00</b>	

### **10.6 Communication Plan and Progress Reporting**

A monthly, “four-square” progress report will be prepared by the Principal Investigator in accord with Observatory Program Management practices and procedures. Informal reviews will be conducted by the NA ALMA Development Program Manager upon the completion of Level I milestones.

### **11.0 STUDY CLOSEOUT**

Upon conclusion of this Study, the NA ALMA Development Program Office will coordinate the orderly closeout of activities; or, the transition of activities to a continuing Study or 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 any inventory and/or property control issues;
- inactivation of cost accounts;
- preparation of a Final Report;
- preparation of an Outcome Report; and
- archiving of Study records.

**APPENDIX A - REFERENCE DOCUMENTS**

**APPENDIX B – CURRICULUM VITAE OF KEY PERSONNEL**