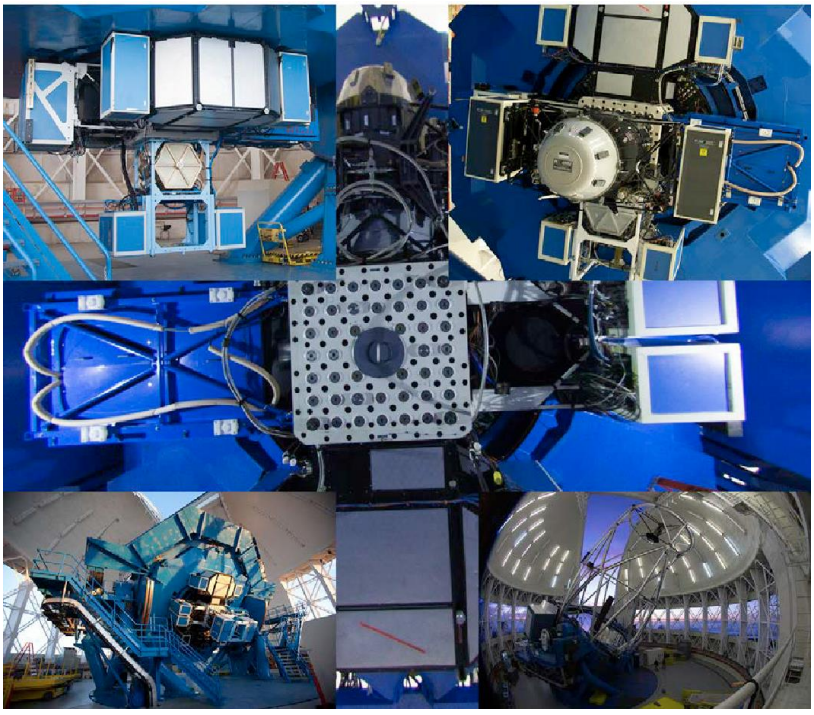
REQUEST FOR PROPOSALS (RFP) – N60354C
For
GEMINI Instrument Upgrades: Small Projects

RFP Main Document (IUSP-01)



ASSOCIATION OF UNIVERSITIES FOR RESEARCH IN ASTRONOMY, INC
OPERATING THE GEMINI OBSERVATORY
Hilo, Hawaii and La Serena, Chile

RFP Schedule
RFP Issued: October 6, 2015
Proposals due: December 17, 2015, 3:00pm MST

Prepared by
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SECTION I. INTRODUCTION AND BACKGROUND

The Gemini Observatory consists of two 8-meter telescopes, one located on Maunakea in Hawaii, USA (Gemini North), the other on Cerro Pachón, Chile (Gemini South). The Association of Universities for Research in Astronomy, Inc. ("AURA") is the managing organization of the Gemini Observatory under a cooperative agreement with the National Science Foundation for the benefit of the Gemini funding nations: The United States of America, Canada, Brazil, Argentina, Australia, and Korea (the latter two as limited-term partners during 2016). For more information, visit the Gemini Observatory website at www.gemini.edu.

AURA and Gemini Observatory are committed to providing its community with the best possible competitive instrumentation suite given technological and financial constraints. This commitment includes investing funds to upgrade its operational instruments to keep them scientifically competitive. Gemini's development program will provide funding to upgrade existing operational instrumentation, creating new instrument capabilities at the Gemini North and/or Gemini South telescopes. The current release of funds for this purpose has been labeled 'Instrument Upgrades: Small Projects' (IUSP). The Observatory is seeking community-created, science-driven instrumentation upgrade proposals, and will consider any area that fits the set of IUSP requirements provided below. The Science and Technology Advisory Committee (STAC) endorsed Gemini's guidelines for the IUSP activity in its 2015A report.

Gemini has a total budget of $200,000 for the IUSP in this call and is intending to fund two or more projects; however, compelling proposals requesting up to the whole budget will be fully considered. Gemini also welcomes proposals to perform instrument upgrades with minimal or no funding from Gemini.

The RFP is open to all institutions or companies from Gemini partner nations. The RFP is open to non-partner country Principal Investigators who have significant and relevant experience in using, designing, and/or building a Gemini instrument. Small businesses, minority-owned firms, and women's business enterprises that meet the minimum qualifications are encouraged to apply.

RFP Selection Events

RFP Schedule	Date
Release RFP	6 October 2015
Email Notice of Intent to Submit Proposal	27 November 2015
Proposal Deadline	17 December 2015 at 3:00 PM (MST)
Contractor selection	10 February 2016 (This date is estimated and only included to provide proposers scheduling guidance. Selection may occur sooner or later.)

SECTION II: STATEMENT OF WORK, REQUIREMENTS, AND PROJECT DELIVERABLES

Statement of Work

Gemini Observatory seeks to maximize flexibility and enhance instrument performance by funding small projects to upgrade multiple operational instruments in one or both observatory locations. IUSP projects should produce a tangible result that creates or enables new science based on existing facility operational instruments that meet Gemini's constraints and needs including funds available, desired schedule, and community input. This program is not intended for design studies for future operational instruments or larger upgrades. Data processing software project proposals that do not increase an instrument's capability will not be considered.

Gemini will provide:

- Up to 10 hours of on-sky telescope time per project to be used for demonstrating the upgraded instrument's new capability.
- All relevant existing instrument documentation, i.e. the existing design records, technical manuals, service and calibration manuals, data reduction pipeline manuals, and user manual.
- All needed, relevant existing instrument software, i.e. the existing instrument control software, data reduction pipeline software, etc.
- Available facilities, equipment, and staff support (See Requirement 7) to support the upgrade.

Reference Documents

Gemini operational instruments information website.

Requirements

1. The project's scientific value must be clearly described in the proposal.
2. Each proposal must include top-level science requirements for the upgrade derived from one or more sufficiently developed science cases.
3. Gemini will only consider proposals for instrument upgrades of minimal to moderate technical risk. The proposal must thoroughly identify and suggest the mitigation of key risks and expected instrument downtime.
4. Proposals must demonstrate the designed upgrade is technically achievable with existing technology.
5. The proposed instrument upgrade must **not** require major alterations to the Gemini telescopes and must comply with the Gemini Interface Control Documents (ICDs).
6. The project must include readiness testing prior to going on-sky and full

characterization of the upgrade after going on-sky.

7. The proposal must clearly state the Gemini documentation and Gemini resources needed for project completion. The project should require a minimal level of effort from Gemini staff. Gemini will assess the impact of the project and the outcome against the resources needed to support the project. Gemini will assign the relevant resources, pending availability, to support the team in its work such that each upgrade is successfully achieved.
8. The project must provide any necessary updates to existing instrument documentation and Gemini-supplied data reduction software and procedures resulting from the upgrade. The proposal must state what documentation will be delivered as part of the upgrade.
9. The proposal must include a description of the proposed instrument upgrade and functions. Documentation must include the relevant layouts describing the optical, opto-mechanical, electrical, and software elements of the proposed instrument upgrade.
10. Work for each project is expected to be completed within twelve (12) months of contract execution.
11. The proposal may request up to 10 hours of on-sky telescope time to demonstrate and realize the scientific capability of the upgrade. The request must describe how the requested telescope time will be used to demonstrate the new scientific capability.

Project Deliverables

Intermediate Deliverables

The Contractor and Gemini shall agree to a list of key intermediate deliverables and milestones based on the proposals and subsequent contract negotiations. The intermediate project deliverables will include:

1. **Kick off Meeting:** Within one week of Contract execution, Contractor shall host a kickoff meeting to clarify the project and its requirements. The Technical Representative and other Gemini personnel shall attend (either in person or via videocon) for Gemini, and at least all key members of Contractor's team shall attend.
2. **Progress Reports:** A brief written monthly progress report highlighting the work performed and costs incurred during the previous month, noting any significant changes in the baseline schedule or the project's risks. The progress report should also track assigned action items between AURA and the team. The Progress Report is intended to be brief and serve as an auditable record of work performed.
3. **Monthly Videocon:** By the fifteenth day of each month, the Contractor and the

Technical Representative will have a videocon arranged by Gemini, in which Gemini and the Contractor will review that month's Progress Report.

4. **Acceptance Test Plan:** An acceptance test plan is required before commencing any changes to the instrument and its associated systems. The test plan shall include benchmark tests to unambiguously assess performance before and after the changes occur.
5. **Gemini Visit:** Gemini may choose to visit the worksite to review work progress and/or evaluate project readiness for delivery. Gemini will cover all costs for its employees while the host will supply the necessary meeting venue and staff.

Final Deliverables

1. **Upgraded Instrument:** (hardware and/or software) according to the accepted IUSP proposal.
2. **Acceptance Test Report**: The Acceptance Test Report will contain measured results against the test contained within the Acceptance Test Plan. The report will contain results for the instrument before the upgrade took place and after the upgrade took place. The compliance summary matrix must compare the requirements with the achieved performance after the upgrade.
3. **Updated Instrument Documentation Set:** Update relevant components of the instrument documentation set which may include the User's Manual, Operational Concept Definition Document, Service and Calibration Manual, Functional Performance Requirements Document, Instrument Records, User Manual, Software Manual, and Data Reduction Pipeline Manual (see Appendix A for further information).
4. **End of Project Report:** to include a re-commissioning report, a summary of objectives achieved, and lessons learned.
5. **Instrument Upgrade Announcement:** An announcement and synopsis describing the instrument upgrade and demonstrating its performance, including any preliminary scientific results from the commissioning data.

Additional deliverables should be defined within the proposal itself in accordance with the specific aspects of the upgrade. Depending on the proposal, not all of the instrument documentation set may need updating. For example, there would be no reason to upgrade mechanical drawings if the upgrade were purely software.

SECTION III: INSTRUCTIONS TO PROPOSERS

Request for Proposal Documents

This Request for Proposal is comprised of the following documents:

1. Request for Proposal (Document IUSP-01), this document.

2. Proposal Form (Document IUSP-02) available in Microsoft Word format. Please review this document carefully before beginning work on your Proposal.

3. Fixed-Price Gemini Observatory Instrument Upgrade: Small Projects contract. This is the contract that will be used for the contract awarded as a result of this RFP. This contract is made up of the following elements:
    A. Main Document (IUSP-03.1), which covers the basic terms of the contract (including price schedule) that will be used for the project. Although this document has a signature line you do NOT need to fill this in or return it as part of your proposal.
    B. Statement of Work (IUSP-03.2).
    C. Terms and Conditions (IUSP-03.3).
    D. Accepted Proposal.

Intent to Submit

Please notify AURA of your intent to a submit proposal(s) by the 27 November, 2015. Please send an email to the AURA Contracts Officer (see Section V) stating that you intend to submit a proposal and provide the names of the institutions involved. This information will allow AURA to ensure that the members of the evaluation committee reviewing the proposals do not have any conflicts of interest. Failure to give advance notice of your intent to submit a proposal and/or failure to disclose membership of your team may result in delays in the selection process. AURA will not publicly disclose the names of the institutions and companies that notify Gemini of their intent to propose.

Submitting a Proposal

Proposals are contractually binding offers. By submitting a proposal you are making an offer to enter into a contract. You also agree that if you fail to sign such a contract promptly when it is offered to you, AURA may elect, at its sole discretion, to offer a contract to another proposer.

Each proposal must have a lead institution. A group of institutions may not submit a joint proposal in which multiple institutions are all listed as equal partners. The only way for a group of institutions to submit a proposal is for one company to submit a proposal as a lead contractor with the other institutions listed as subcontractors. We require a single lead contractor for each team so that the contract can be quickly awarded without delays associated with placing multiple contracts for one team's effort. It is the lead contractor's

responsibility to ensure subcontractors are ready to start and complete the work within the required period.

Download and complete the Proposal Form (Document IUSP-02) in Microsoft Word format, answer all the questions, and provide all the requested information and documentation. In addition, complete and submit your proposal containing the following listed sections: (provided page limits are meant as generous limits and are not meant to imply each section must be that length; shorter submissions are happily accepted):

1. Executive Summary (two pages). A brief summary of proposed project that includes the science case, the proposed upgrade, and the impact on and involvement with the Gemini community.

2. Scientific Justification for the instrument upgrade and science requirements (up to 6 pages).
    A. Include the science objectives/questions/cases on which the work will be based and a description of the science enabled by the instrument upgrade.
    B. Describe the relevance to astronomers in the Gemini partner communities and how/if the science case provides synergies with existing and future capabilities and survey discoveries.
    C. Clearly derive any provided science requirements from the provided science case.

3. Proposal for up to 10 hours of telescope time using the upgraded instrument to realize an early science objective aimed at demonstrating the upgraded capability (up to 2 pages).

4. Technical Requirements and Design Changes (up to 8 pages).
    A. Present a description of the proposed instrument upgrade and its function(s). Include a proposed list of deliverables.
    B. Provide a list of changes to the instrument's technical/performance requirements.
    C. Provide a list of the documentation and technical information required from Gemini.
    D. Provide available details of any planned optical, opto-mechanical, electrical, and software changes including changes in the instrument's major subassemblies that would be changed during the project.
    E. Demonstrate the feasibility of the instrument upgrade.
    F. Demonstrate that the instrument design will fit within the technical constraints and flexible operating environment of the Gemini telescopes.
    G. Provide a description of the known risks associated with the proposed upgrade along with plans to address them.

5. Project Management, System Engineering, and Team Experience (up to 8 pages).

A. Provide an organizational chart, work breakdown structure, and project schedule for the project.
B. Provide an explanation of how cost, schedule, and requirements will be monitored and controlled during the work.
C. Provide a description of the overall risk management approach.
D. Provide a description of any systems engineering methods to be used and tools that would be used during the project.
E. Provide a description of the project management approaches and tools that would be used during the project.
F. Provide background information including the experience, knowledge, and strengths the team would bring to Gemini in performing the work.
G. Provide details of any work that would be subcontracted along with the relevant qualifications and experiences of the proposed subcontractor(s).
H. Provide any available statements of support from the lead institution and describe the priority of this project relative to others being undertaken.

6. Publication List: Provide a relevant scientific and technical publication list for key member of the team.

Have the completed Proposal Form reviewed, approved, and signed by the appropriate administrative official of your institution or company who has authority to bind your institution or company to contractual obligations. In addition, ensure that you have equivalent assurances from all subcontractors.

The entire report must be paginated. Margins in all directions must be at least one inch. Proposal text must be in a standard, single-column format.

Proposals must be submitted as a single electronic document in Adobe Acrobat PDF format. Please do not send a hard copy and do not submit multiple electronic documents. Whenever possible, the size of the PDF file should be minimized by printing documents directly to PDF instead of scanning them. Where signatures are required in the Proposal Form, proposer may effectively sign by either: (1) Electronically signing a PDF file using the Adobe Acrobat Digital Signature Tool; or (2) Sign a hard copy and then scan the signed page to PDF and attach the signature page to the main document.

Submit your proposal by emailing it as a PDF file attachment to the AURA Contracts Officer (see Section V). All proposals must be received by AURA on or before the due date and time stated at the top of this document.

No oral, telegraphic, or telephonic Modifications to Proposals will be considered. Modifications to Proposals submitted may be made electronically, if the modified Proposal Documents are delivered to AURA in accordance with the Modification of Proposal section (below) before the Proposal due date.

If selected and contract objections exist, AURA will strive to resolve all objections within 10 working days of selection.

Acknowledgement of Proposals

Receipt of proposals will be acknowledged by email by 5:00pm MST of the next working day following the deadline for submitting proposals. Please contact the AURA Contracts Officer (see Section V) if you do not receive an acknowledgement. AURA reserves the right to accept proposals submitted after the deadline if it can be documented that the failure to meet the deadline was due to technical problems with the transmission of the proposal by email.

Modification of Proposal

Proposals that have already been submitted may only be modified by means of submitting a replacement proposal before the deadline for receipt of proposals. Proposals may not be modified after the due date.

Proposal Withdrawals

A Proposer may withdraw its Proposal(s) by written request (i.e., email) at any time prior to the scheduled closing time for receipt of Proposals. Thereafter, all proposals, including all subcontracts, must be valid for 120 days and cannot be withdrawn or modified during that period. Contractors must ensure that this requirement is effectively communicated to all their subcontractors.

Proposal Representations

By submitting a proposal you are representing that you have carefully examined this RFP and its referenced documents, understand all aspects of the work, and are not aware of any ambiguities in the scope of work or specifications that may affect your proposed price or schedule. By submitting your proposal, you are also representing that:

1. You have the technical and management capabilities to perform the work in a timely and competent manner.

2. You are not aware of any pending legal, financial, or other action that could have a material detrimental effect on your ability to perform the work in a timely manner.

3. You have the financial resources reasonably required to complete the work in a competent and timely manner.

4. You have the proposed facilities, tools, staff effort, and equipment necessary to perform the work in a timely and competent manner.

SECTION IV: EVALUATION CRITERIA

AURA will use evaluation scores to assist in selecting proposals for contract award and will consider the following criteria in preparing evaluation scores. The evaluation criteria are listed below with their weighting.

Criterion	Weight

Scientific Justification for the instrument upgrade and science requirements — 40%

1. Is the proposed scientific benefit of value to the Gemini community?
2. Has the proposal included clear and comprehensible science objectives/questions that the work will address?
3. Does the science case clearly include a description of the science enabled by the instrument upgrade?
4. Is the scientific motivation for the proposed instrument upgrade relevant and well justified?
5. How well have the science requirements been derived from the science case?
6. Are well-defined metrics proposed for assessing the outcomes?

Technical Requirements and Design Changes — 30%

1. Is the proposed work technically feasible with an acceptable level of risk and lifetime support from Gemini staff?
2. Has the team demonstrated that the proposed upgrade design will achieve the objectives described in the scientific justification?
3. Are the top-level technical specifications clearly linked to the science requirements and science case?
4. If appropriate, does the proposal provide details of the optical, opto-mechanical, electrical, and software design of the proposed instrument upgrade, detailing the subassemblies to be changed? Are they appropriate given the intended upgrade?
5. How well does the proposal describe any known technical risks associated with the proposed instrument upgrade and present mitigation plans?
6. Does the proposed instrument upgrade fit within the technical constraints of the Gemini telescopes?
7. The instrument must not require major alterations to the Gemini telescopes; if relevant, how well does the proposed upgraded instrument comply with the Gemini ICDs?
8. Has updating the relevant documentation been included in this proposal? Is it appropriate given the scale of the project?
9. Are the documentation and technical resources requested from Gemini available?

Project Management, System Engineering, and Team Experience 30%

1. Is it demonstrated that the envisioned instrument upgrade can be executed within Gemini's cost and schedule envelopes?
2. Does the project plan consider the impact on Gemini resources and required Gemini staff level of effort?
3. Does the proposal include an explanation of how cost, schedule, and requirements will be monitored and controlled?
4. How well does the proposal describe the system engineering methodology, project management approach, and tools to be used during the project execution?
5. Is the team well suited (qualified) and supported for successful completion of the proposed work?
6. Does the proposal include a list of relevant scientific and technical publications for key members?
7. Has a statement from the lead institute(s) been given to express the relative priority of this project, should it be awarded?
8. How reasonable and realistic is the proposed installation schedule?
9. How well does the proposed installation schedule meet the expectations of AURA and Gemini?
10. Is the team well suited to perform the proposed work successfully?
11. What will be Gemini's ongoing operational and maintenance costs associated with this upgrade?
12. Is the proposed scientific use of the requested observing time well justified?

Proposal Price

Gemini has a total budget of $200,000 for the IUSP in the 2015 call and is intending to fund two or more projects; however, compelling proposals requesting up to the whole budget will be fully considered. All proposals must be submitted to Gemini to allow for evaluation, review and internal planning for the allocation of Gemini support and resources. A price and cost analysis will be conducted as part of the evaluation.

In addition to the evaluation described above, AURA will consider each proposal's perceived value in making its final selection.

SECTION V: COMMUNICATIONS AND QUESTIONS

Any questions or requests for clarification of this Request for Proposals document should be directed to:

Karen Godzyk
Contracts Officer
Association of Universities for Research in Astronomy, Inc.
950 N. Cherry Avenue
Tucson, AZ 85719
Email: rfpiusp@gemini.edu
(520) 318-8357 (MST)

To receive updates about the IUSP RFP, please provide contact information including an email address to the AURA Contracts Officer.

General procedural questions can be handled by telephone. Questions or requests for clarification regarding the statement of work, requirements, or specifications must be submitted by email and must be received at least five working days before the due date for proposals. Answers and clarifications that modify or clarify any of the documents included in this RFP will only be made in writing; contractors shall not rely on verbal answers or clarifications. AURA may decide to share any questions and their answers with all of the contractors by issuing a supplement to the RFP.

To ensure that all potential Contractors receive the same information, clarification or direction by other persons at AURA or individuals at the Gemini Observatory is not permitted during the RFP process. Contractors may not contact any other person at Gemini regarding this procurement without express permission from the AURA Contracts Officer, and contractors may be disqualified from participating in this procurement if they attempt to communicate about this procurement with AURA or Gemini personnel other than the AURA Contracts Officer.

Contractors may request modifications to any requirements that are impossible to meet or that appear to needlessly increase the cost of the work. These requests for modifications should be submitted as early as possible before the due date for submitting proposals. Modifications will be issued to all contractors through an amendment to the RFP.

AURA may modify parts of the RFP after it has been released. Modifications will be made only by means of amendments to the RFP posted at the top of the RFP web page. Proposers are encouraged to check the Gemini website regularly. Verbal amendments will be void, so do not rely on any modification to anything in this RFP unless it has been confirmed by a written RFP amendment posted on the website.

APPENDIX A: DOCUMENTATION SET

Depending on the specific aspects of the upgrade, the updated instrument documentation set may include:

A. User's Manual, OCDD/ConOps Manual: Changes in which the contractor describes each of the changed instrument's operating modes and their key operating scenarios.
B. Service and Calibration Manual: The contractor describes the relevant changes, additions, and deletions to service and calibration needs and procedures as a result of the upgrade. This includes:
    1) A description of optical mounting schemes, including the approach used to mount and align any changed mechanical and optical subassemblies.
    2) A description of new key risks, e.g. long-term stability of optical alignment, manufacturability, coating reliability, expected lifetimes, etc. and an updated risk register for the changed instrument / subassemblies.
    3) Outline of instrument integration procedure with any new subassemblies.
C. OCDD and FPRD/Requirements Document: Changes to the instrument requirements and requirement traceability according to the changes performed to the instrument.
    1) Each new/changed requirement must identify the source(s) used to derive it, briefly describe how the requirement was derived from its source, and explicitly state any assumptions made.
    2) Each new/changed requirement must be quantified and objectively verifiable at some stage in the testing or commissioning of the instrument upgraded subsystems.
    3) Include a description in the OCDD of how the science cases flow down to the top-level instrument requirements.
D. Instrument Records: Contractor shall document the key engineering design changes including:
    1) A description of the changed instrument's subassemblies.
    2) Changes to any instrument optical design files.
    3) Changes to any mechanical design and manufacturing drawings.
    4) An overview of any modified electronic systems including a detail of all commercial and custom boards used.
E. Technical Manual/User Manual: Contractor shall document the any optical and mechanical changes of the upgrade by including at least the following:

1) A depiction of the general layout of the mechanical and optical components to be affected by the upgrade, including designs (3D models/drawings), spot diagrams, flexure analysis, tolerance, etc., as needed.
2) A demonstration that the instrument's new capability is operating under Gemini's interfaces (see Interface Control Documents) and operating environment, including flexure, vibration, windshake, temperature, humidity, dust, etc.
3) A description of any new/changed throughput budgets or required optical tolerances for the changed optical subassemblies.
4) Details of any new or modified observing modes.

F. Software Manual: If there are upgrades to instrument operation software, the contractor must deliver a description of the new software work and design, including.
   1) A top-level flow chart or other description of the structure and function of the new code.
   2) In-code documentation consistent with that previously present in the existing code. Regardless of existing inline documentation, upgrade inline documentation must adequately describe the workings of the code so that an experience software engineer not familiar with the upgrade code could understand it.
   3) A top-level description of any internal interfaces to third party products, with a focus on types of communication between software components and protocols.
   4) A top-level description of required development platforms and tools, with specific identification of which items will need to be acquired.

G. Data Reduction Pipeline Manual: Contractor will provide any needed update to the data reduction software and documentation including a document describing the changes in the data reduction process.