REQUEST FOR PROPOSAL (RFP)

Gemini Instrument Feasibility Studies

RFP No. 0506720

RFP Main Document (GIFS-01)

Association of Universities for Research in Astronomy, Inc. (AURA)
Operating the
Gemini Observatory
Hilo, Hawaii and Cerro Pachón, Chile

RFP Schedule

RFP Issued: 19th September 2014

Bidders Conference: 31st October 2014

Notice of intent to submit proposal due: 17th November 2014

Proposals due: 15th December 2014 at 23:00 Pacific Standard Time

Prepared by:

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19 September 2014

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1 Introduction and Background

a) The Gemini Observatory consists of two 8-meter telescopes, one located at the summit of Mauna Kea in Hawaii, USA; the other at the summit of Cerro Pachón in Chile. 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, Argentina, Brazil and Australia. For more information, visit www.gemini.edu, the Gemini Observatory website. Information about Gemini's current facility instrumentation can be found at: http://www.gemini.edu/sciops/instruments/?q=sciops/instruments

b) The Gemini Instrument Feasibilities Studies (GIFS) project is part of a program that will provide a number of community-created science-driven instrumentation design study reports and presentations to the observatory, conforming to a number of desired principles.

c) Following the project, Gemini together with the Gemini Science and Technical Advisory Committee (STAC) and input from the wider community will decide on the top-level instrument requirements for the next facility instrument (Gen4#3) and launch a targeted Request for Proposals to design, build, test and deliver a suitable instrument. Gemini expects to release an RfP for Gen4#3 in 4Q-2015.

d) **STAC Principles:** The STAC identified the following principles for the feasibility study in their 2012B report: (see http://www.gemini.edu/science/public/STAC/stac2012b_report.pdf)

- *The instrument should be a workhorse instrument, meaning that it has broad scientific appeal and enables a wide range of science cases.*
- *The proposals should be science driven and include science cases. Science cases that provide synergies with new capabilities coming online (e.g. LSST, JWST, ALMA, etc) are highly desirable, especially including capabilities needed to follow up survey discoveries.*
- *The instrument should fit within the technical constraints of the Gemini telescopes as they now exist.*
- *The expected cost of the instrument shall be capped at a cost that is to be determined as part of the process of defining the RfP.*
- *The technical risk of the instrument should be modest, i.e. the success of the instrument should not depend upon some not-yet-proven technology.*
- *The instrument should be highly efficient, maintaining the 8-m aperture advantage.*
- *Although proposals for all instruments fitting these criteria will be fully considered, it is the majority opinion of the STAC that a wide-bandwidth moderate-resolution spectrograph is likely to prove most compelling.*

e) Gemini intends to award three or more fixed-price GIFS contracts for instrument feasibility studies, with the maximum available budget for each contract limited to USD 100,000. Our total budget for this activity is USD 300,000.

f) In addition, Gemini also welcomes proposals to perform instrument feasibility studies with partial or no funding from Gemini. Gemini requests proposals are still submitted to allow for internal planning and for the allocation of internal support each study.

g) Gemini encourages collaborations and will provide a mechanism for groups to find additional partners to form a complete team for this work. Thus, groups with some interest in GIFS, but lacking the complete expertise needed to complete the work, should still submit a letter of intent and use our system to find additional partners for the work.

h) Gemini plans to have work begin on the instrument feasibility studies in February 2015 and will require that the studies be completed within seven months. The project has hard milestones and deadlines given the fixed date of the 2015 Meeting on the Science and Future of Gemini: 15th – 18th June 2015.

GIFS RfP/Selection Events	**Date / Deadline**
Release RfP	19th September 2014
Bidders Conference	31st October 2014
Notice of Intent to Submit Proposal	17th November 2014
Proposal Deadline	15th December 2014
Proposal Evaluation Review	12th January 2015
Selection Deadline	19th January 2015
Contract Negotiations	26th January – 6th February 2015

Contract Events	**Date / Deadline**
Start Feasibility Studies + Kickoff Meeting	week beginning 9th February 2015
Midpoint Site Visit	week beginning 11th May 2015
Feasibility Study Progress Presentation at the 2015 Gemini Meeting	15th - 18th June 2015
Submit Initial Feasibility Study Report	13th July 2015
Feasibility Study Review	10th - 12th August 2015
Submit Final Feasibility Study Report	12th September 2015

i) The RfP is **open worldwide**, and not restricted to the Gemini community. The Gemini instrument feasibility study can be awarded to profit or non-profit institutions or companies outside of the nations that fund the Gemini Observatory's instrumentation program.

j) The three main contract deliverables will be the:
- Feasibility Study 2015 Gemini Meeting Progress Presentation (30 minutes presentation)
- Feasibility Study Report
- Feasibility Study Review Presentation (0.5 day review)

k) Gemini is looking for science-driven feasibility studies based on a facility instrument costing between USD 8,000,000 and USD 12,000,000 to design, build, test and commission. The preferred duration for such a project is expected to be no more than 6 years.

l) As described fully in the statements of work, GIFS-03.2, the Feasibility Studies objective is to produce a number of viable science-driven concepts that meets the STAC's guiding principles and Gemini's constraints, including funds available, desired schedule and community input.

m) Gemini will require that each feasibility study include sufficiently developed science case(s) such that science requirements can be derived. Requirements should flow from the science objectives down to top-level instrument specification. The feasible instrument design must contain optical, mechanical, electronic, and software design elements at the conceptual level, as needed to demonstrate the technical feasibility. In particular, each design study should thoroughly identify and suggest the mitigation of key risks.

n) In order to reduce risk, instrument development time and expense, teams are encouraged to use existing designs of proven, robust instrument subassemblies whenever possible. This will have the added benefit of simplify instrument maintenance. Hence, Gemini encourages teams to use aspects of existing designs. The use of new technology in the design should be supported by proven, existing examples of its use.

o) Gemini expects the contractor to adopt a formal project management methodology and system engineering approach during the study.

p) Gemini expects to have its personnel supporting the selected project teams from the beginning of the study. As the studies are noncompetitive (i.e. no resulting down select), Gemini will assign the most relevant resources, pending availability, to assist the team with their study such that the most significant and accurate study report and presentation is created.

q) **Bidders conference.** Gemini will host a virtual meeting open to all persons interested in responding to this request for proposals. The date of this meeting is given at the top of this document. The exact agenda and details of the meeting will be sent to each institution's single point of contact for this procurement. At this meeting Gemini will review the RfP material and encourage potential bidders to ask questions. It is not necessary to attend this conference to submit a proposal, yet Gemini encourages teams to attend.

r) Request for Proposal Documents. This Request for Proposal document set is comprised of the following documents:
   - Request for Proposal (Document GIFS-01). This document.
   - Proposal Form (Document GIFS-02); available in Microsoft Word format. Please review this document carefully before beginning work on your proposal.
   - Fixed-Price Gemini Instrument Feasibility Study Contract (Document GIFS-03). This is the contract that will be used for the feasibility design study contracts awarded as a result of this RFP. This contract is made up of the following elements:
     i. Fixed-Price Gemini Instrument Feasibility Study Contract: **Main Document (Document GIFS-03.1)** which covers the basic terms of the contract (price,

schedule) that will be used 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.

ii. Fixed-Price Gemini Instrument Feasibility Study Contract: **Statement of Work (Document GIFS-03.2)** which provides the scope of work for the Instrument Feasibility Study.

iii. Fixed Price Gemini Instrument Feasibility Study Contract: **Terms and Conditions (Document GIFS-03.3)** which contains various standard terms and conditions for the contract.

2 Proposal Guidelines

a) **Intent to submit.** Please notify Gemini of your intent to submit proposal by the 17th of November. Please send an email to Cathy Blough (gifs_rfp@gemini.edu) notifying her that you intend to submit a proposal and the names of the institutions and or companies that would be performing significant parts of the work. This information will allow Gemini to ensure that the members of the 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. Gemini will not disclose the names of the institutions and companies that submit notices of intent to bid unless specifically requested to do so.

   If you are seeking additional partners for your effort, please indicate your expertise, the areas of expertise you are seeking, and your desire to have Gemini publish this information on its GIFS website for others to see. In this way, we hope teams looking for additional partners can be brought together.

b) **Submitting a proposal:** Download and complete the Proposal Form (Document GIFS-02) in Microsoft Word format, answer all the questions and provide all the requested information and documentation.

c) Each proposal must have a lead institution/company. A group of institutions/companies may not submit a joint proposal where they are all listed as equal partners. The only way for a group of institutions/companies to submit a proposal is for one institution/company to submit a proposal as a lead institution with the other institutions/companies listed as subcontractors. A single lead institution is required so that the contract(s) can be quickly awarded without delays associated with placing multiple contracts for one team's effort.

d) Have the completed Proposal Form reviewed, approved, and signed by the appropriate administration 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.

e) Convert the finished proposal to PDF format. Proposals should 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 format instead of scanning them. Where signatures are required in the Proposal Form you should print the page, have it signed, and then scan the signed page to PDF and attach the signature page to the main document.

f) Email the Proposal to the AURA Contracts Officer. All proposals must be received by us on or before due date and time given at the top of this document. You can submit your proposal

by emailing it as a PDF file attachment to Catherine Blough, AURA Contracts Officer, at gifs_rfp@gemini.edu.

g) Proposals are contractually binding offers. By submitting a proposal you are making an offer to enter into a contract prepared using the Fixed Price Gemini Instrument Feasibility Study Contract (Document GIFS-03) with the Statement of Work (Document GIFS-03.2) portion modified to conform to the specifics of your proposal. You also agree that if you fail to sign such a contract promptly when it is offered to you, Gemini may elect, at its sole discretion, to offer a contract to another institution/company and/or pursue any available remedies.

h) If selected and contract objections exist, AURA will aim to resolve all objections within 10 working days of selection and will travel to the institute to negotiate if required.

i) **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 Catherine Blough (gifs_rfp@gemini.edu), the AURA Contracts Officer, if you do not receive an acknowledgement. Gemini 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.

j) **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.

k) All proposals, including all subcontracts, must be valid for 90 days and cannot be withdrawn or modified during that period. Vendors must ensure that this requirement is effectively communicated to all of their subcontractors.

l) 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 which 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; and (4) you have the facilities, tools, staff effort and equipment necessary to perform the work in a timely and competent manner.

3 Proposal Format

a) The entire proposal must not exceed a total of 50 pages.

b) It is important that all proposals conform to the instructions provided in this RFP. Strict conformance is required unless there has been an authorized change through an amendment to the RFP.

c) The entire proposal must be paginated. Margins, in all directions, must be at least one inch. Proposers are strongly encouraged to use only a standard, single-column format for the text.

d) Use one of the following typefaces identified below:

   a. Arial 11, Courier New, or Palatino Linotype at a font size of 10 points or larger;

   b. Times New Roman at a font size of 11 points or larger; or

   c. Computer Modern family of fonts at a font size of 11 points or larger.

e) A font size of less than 10 points may be used for mathematical formulas or equations, figures, table or diagram captions and when using a Symbol font to insert Greek letters or special characters. However, the text must be readable without the use of a magnifying device (eye glasses excepted).

f) No more than six lines of text within a vertical space of one inch.

g) Proposals must be submitted in PDF format with clear section titles corresponding to the RFP.

4 Proposal Content

Your Gemini Instrument Feasibility Study proposal document must include the following named sections (listed in boldface). Your proposed design study must be consistent with the Statement of Work (Document GIFS-03.2) for the feasibility study that is included in the RFP.

a) **Executive Summary**: a brief one page summary of proposed project approach.

b) **Science objectives, science case and science requirements:**
- Include the science objectives/questions you will base your study on.
- Include draft/initial science case(s) based on addressing the science objectives/questions.
- Include a description of the science enabled by the instrument.
- Either present a wide range of science cases or a strategy for obtaining a wide range of science cases during the study.
- Give an explanation of the scientific motivation for the proposed instrument design.
- Demonstrate how the draft/initial science case(s) have relevance to astronomers in the Gemini partner communities.
- Demonstrate how the draft/initial science case(s) provide synergies with existing and future capabilities and survey discoveries.
- Clearly derive any provided science requirements from your draft/initial science case(s).
- Propose how you would grow/expand/evolve the science objectives, case and requirements during the feasibility study, maximizing the knowledge of Gemini's international community.
- Describe how you would use study funding to expand, build and strengthen the scientific case for your proposed instrument.

c) **Feasible Instrument Design and Technical Requirements:**
- Given any science requirements, present any derived top-level (system) requirements for your proposed instrument.
- Present a description of the proposed instrument's design and functionality.
    - Include brief descriptions of the instrument's major subassemblies.
    - Provide any available details about the optical, opto-mechanical, electrical and software designs.
    - Provide any relevant layouts of the instrument's major subassemblies.
- Propose how you would use study funding to create/develop the design.
- Propose how you would demonstrate the feasibility of the design.
    - Gemini would prefer an efficient instrument of modest technical risk. How would you demonstrate the design is technically feasible with today's technology or with a reliable technology roadmap appropriate for the required timescale of the instrument?
- Provide a description of the known risks associated with feasibility of the proposed design along with your plans to address/research and mitigate them.

- Confirm that the proposed specification/design represents an instrument with broad scientific appeal (i.e. a potential "workhorse" instrument) and is highly efficient, maintaining the 8m aperture advantage.
- Consider how you will demonstrate the feasible instrument design will fit within the technical constraints of the Gemini telescopes.
    - The proposed instrument must not require major alterations to the Gemini telescopes and must comply with the Gemini ICDs.

d) **Project Management Plan and System Engineering**:

- Provide a description of the systems engineering methodology approach and tools that would be used during the feasibility study.
- Provide a description of the project management approaches and tools that would be used during the feasibility study.
- Provide an explanation of how cost, schedule and requirements will be monitored and controlled during the work.
- Provide an organizational chart.
- Provide a description of the overall risk management approach.
- Include a work breakdown structure and Gantt chart for the feasibility study.
- Include and justify your proposed budget for completing the feasibility study.
- Give an explanation as to why the team believes designing, building and testing the instrument can be completed within Gemini's budget range and schedule. (See Section 1k)

e) **Background Information**:

- Provide an explanation of why the team and their institution(s) are interested in this project.
- Describe the experience, knowledge and strengths the team would bring to Gemini in performing the work.
- Provide a description of the history and structure of the organization(s) and subcontractor(s).
- Provide brief biographies of the key team members and include a description of past projects, highlighting collaborative projects that required scientific knowledge and technical and management skills similar to those required for this work.
- Provide a relevant scientific and technical publication list for key members of the team.
- Provide details of any work that would be subcontracted, including their experience of the proposed subcontractors.
- Provide any available statements of support from the home institution(s) and describe the relative priority of this project relative to others being undertaken.

f) **Contract Form Objections**:

- List all of your objections to the provisions of the contract (GIFS-03). Optionally you can supplement your proposal with a redline version of the contract.

5 Evaluation Criteria

Evaluation criteria: Gemini will use evaluation scores to assist in selecting proposals for contract award and Gemini will consider the following criteria in preparing evaluation scores. The evaluation criteria are listed below with their weighting. The material used to evaluate each criterion shall include, but not be limited to, the listed sections of the Proposal Document that you are required to include in your proposal as described in section 4.

1. **Science objectives, science case and science requirements**:
   - Has the proposal included clear and comprehensible science objectives/questions that the work will address?
   - How well do the included draft/initial science case(s) address the stated science objectives/questions?
   - Do the science case(s) clearly include a description of the science enabled by the instrument?
   - Is the scientific motivation for the proposed instrument relevant and well justified?
   - Does the proposal demonstrate how the draft/initial science case(s) hold relevance and value to the Gemini community?
   - Does the proposal provide an understanding of how the draft/initial science case(s) provide synergies with existing and future capabilities and survey discoveries?
   - How well have the science requirements been derived from the draft/initial science case(s)?
   - Does the proposal contain a description of how the team would maximize the knowledge of Gemini's community in growing, expanding and evolving the science objectives, case(s) and requirements during the study?
   - How does the team propose spending their budget to expand, strengthen and build the science team?

   [Weighting 45%]

2. **Feasible Instrument Design and Technical Requirements:**
   - Are the top-level technical specifications clearly linked to the science requirements and draft/ initial science case?
   - Has the team demonstrated that the proposed design will permit the realization of the objectives described in the scientific justification?
     - Did they include the description of the instruments major subassemblies?
     - Did they provide details of the optical, opto-mechanical, electrical and software design?
     - Did they provide any drawings showing the instruments major subassemblies?
   - How well did they propose how they will use funds to develop the design?
   - How well did they propose how they will demonstrate the feasibility of the design?
     - Gemini would prefer an efficient instrument of modest technical risk. Is there something to suggest the design isn't technically feasible at this stage given today's technology or with a reliable technology roadmap akin to the required timescale of the instrument?
   - How well did they describe any known risks associated with the feasibility of the design and present mitigation plans?
   - Does their design represent a workhorse instrument?
   - Does the design maintain the 8-m aperture advantage?
   - Is it plausible the envisioned instrument can be built within Gemini's cost and schedule envelopes?
   - Does their design fit within the technical constraints of the Gemini telescopes?

- The instrument must not require major alterations to the Gemini telescopes; how well does the proposed design comply with the Gemini ICDs?

[Weighting 25%]

3. **Project Management Plan and System Engineering:**
   - How well did they describe their system engineering methodology, approach and tools to be used during the feasibility study?
   - How well did they describe their project management approach and tools to be used during the feasibility study?
   - Did they provide an explanation of how cost, schedule and requirements will be monitored and controlled?
   - Did they provide an organization chart?
   - How well did they describe the overall risk management approach? Are appropriate risk management approaches and tools in place to help ensure a successful feasibility study?
   - Did they include a work breakdown structure and Gantt chart for their feasibility study?
   - Did they include a budget to complete the feasibility study?
   - How well do they explain why they believe the instrument could be designed, built, tested within Gemini's overall budget for this project?
   - Does the team have the necessary resources, management structures, and approaches to complete the work within the cost and schedule constraints required by Gemini?

[Weighting 15%]

4. **Background Information:**
   - How well does the proposal provide a strong explanation of why the team and their institute(s) are interested in the project?
   - How well does the proposal describe the experience, knowledge and the strength of the selected team?
   - Does the proposal clearly provide a history and structure of the main organization(s)?
   - Does the proposal include brief bios of team members including relevant past projects, and relevant collaborative projects.
   - Does the proposal include a list of relevant scientific and technical publications for key members?
   - If relevant, does the proposal provide details of work that would be subcontracted? Is it clear that the subcontractor has required expertise?
   - Has a statement from the institute(s) been given to express the relative priority of this project, should it be awarded?
   - Is the team well suited and supported for successful completion of the proposed work?

[Weighting 15%]

(a) Gemini will most likely include outside sources in evaluating proposals.

(b) Gemini will seek capability diversity across the funded feasibility studies, so teams are encouraged to collaborate prior to the submission of proposal. Gemini is unlikely to place two contracts to study similar instruments, even if they were the two highest ranked proposals.

(c) Gemini reserves the right to: (1) accept or reject any or all proposals, (2) withhold an award of the contract for any reason, in its sole discretion, (3) delay an award of a contract for any reason, in its sole discretion, (4) cancel the Request For Proposal, and (5) waive any deviations, irregularities or informalities in the proposals.

(d) Gemini will use the evaluation criteria given above to identify certain proposals for possible contract award. The leading vendors will then be sent a contract for signature based on the Contract Form documents and their proposal. Other vendors will not be notified of the results of this procurement until all relevant contracts are actually signed.

6 Communications, Questions & Amendments

a) The contact person for questions or concerns regarding the scope of work or anything else related to this procurement is:

Catherine Blough, AURA Contracts Officer
Email: gifs_rfp@gemini.edu
Tel: 520-318-8222

b) To ensure that all potential vendors receive the same information, vendors may not contact any other person at Gemini regarding this procurement without express permission from the AURA Contracts Officer, and vendors may be disqualified from participating in this procurement if they attempt to communicate about this procurement with Gemini personnel other than the AURA Contracts Officer.

a) General procedural questions can be handled by telephone. Questions or requests for clarification regarding the scope 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; vendors shall not rely on verbal answers or clarifications. Gemini may decide to share any questions, and their answers, with all of the vendors by issuing a supplement to the RFP.

b) Vendors are encouraged to request modifications to any requirements which are impossible to meet or which 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 vendors through an amendment to the RFP.

c) Gemini 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. Notice of amendments will be distributed only to the email addresses to which the RFP was originally sent. 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 this page.