REQUEST FOR PROPOSAL (RFP) - NB3880C

GEMINI NORTH ADAPTIVE OPTICS IMAGER

RFP Main Document (GNAOI-01)

ASSOCIATION of UNIVERSITIES for RESEARCH in ASTRONOMY, Inc. (AURA)

Operating the Gemini Observatory

RFP Issued: September 17, 2019

PROPOSALS MUST BE RECEIVED BY

November 1, 2019 at 15:00 US Mountain Standard Time
(CLOSING DATE)

V.1 Release	17 Sep 2019
V.2 Corrected typo on p3 in 1.l) ~~2013~~ 2014	18 Oct 2019

1. Introduction

a) The Gemini Observatory operates two 8-meter telescopes; the northern observatory is located on Maunakea in Hawaii, USA (Gemini North), the southern observatory is located 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 (NSF). Gemini Observatory Participant nations are the United States of America, Canada, Chile, Brazil, Argentina, and Korea. For more information, visit the Gemini Observatory website at www.gemini.edu. For the purposes of this Request for Proposal (RfP), AURA and Gemini are used interchangeably.

b) Gemini provides facility-class instruments that achieve excellent spatial and spectral resolving power across the spectrum from optical to near-infrared wavelengths. Gemini also maintains world leadership in the adaptive optics support of the scientific instruments. For more information on Gemini's current instrumentation, visit: www.gemini.edu/sciops/instruments

c) Gemini is currently developing a new Gemini North Multi-Conjugate Adaptive Optics (GNAO) system. There are links to white papers describing key GNAO science cases that this instrument needs to enable on the Gemini GEMMA Adaptive Optics web site, www.gemini.edu/gemma/index.html

d) AURA is seeking a team to design, fabricate, assemble, test, deliver and commission the Gemini North Adaptive Optics Imager (GNAOI) instrument. GNAOI will be used with GNAO and a planned future ground layer adaptive optics system.

e) Gemini will consider design proposals that incorporate the GNAOI functionality into a new instrument, an existing instrument, or one currently under development.

f) This request is for proposals for the GNAOI Preliminary Design study. Gemini intends to award two or more fixed-price Preliminary Design study contracts as a result of this RFP. Only teams prepared to complete the design, build, test, and commissioning of this instrument should submit proposals for this Preliminary Design study.

g) Gemini intends to select one team at the end of the Preliminary Design Stage, to proceed with the remainder of the design, build, test, and commissioning (the "Post-Preliminary-Design") work.

h) The following Guiding Principles, extracted from those for GNAO, will guide GNAOI work:

We prioritize meeting the schedule and budget constraints over extra capabilities beyond our baseline and plan to make decisions that, in order of priority:

- *Meet the core science requirements*
- *Reduce cost and schedule risk*
- *Employ currently available technology*

Note that adding additional capabilities beyond those needed to meet the core science requirements is not a guiding principle.

i) Gemini will provide each team selected for the Preliminary Design study the GNAO Conceptual Design documents that will include core science cases and a list of derived core science requirements.

j) The maximum available budget for each Preliminary Design study contract is limited to USD 150,000. All proposals must be submitted in USD and include the provided budget form (See Proposal Form GNAOI-02).

k) Gemini plans to start each Preliminary Design study in January 2020 and will require the studies be completed within five months.

l) GNAOI is a schedule-driven project. The instrument must be ready by March 2024 to begin post delivery acceptance testing at Gemini North with the GNAO facility.

m) Although Gemini is not providing a maximum budget for the complete instrument, Gemini desires GNAOI to be a low-cost, low-risk instrument, and will highly consider overall cost in the final Post-Preliminary-Design downselect.

n) In order to expedite the delivery of this instrument, Gemini, unlike on previous projects, discourages potential design and build teams from seeking partnerships with other institutions.

o) Gemini will provide each team selected for the Preliminary Design study a copy of the Gemini South Adaptive Optics Imager (https://www.gemini.edu/sciops/instruments/gsaoi/) design documents that they may use in their work.

p) Gemini intends to procure and provide to the contractor a 15µm pixel HAWAII-4RG science detector and an engineering grade detector for use in GNAOI.

q) Gemini intends to award up to 4 nights of telescope time to the Post-Preliminary-Design selected team for meeting schedule milestones during the Post-Preliminary-Design work.

r) The Principal Investigator and Project Scientist of the final Post-Preliminary-Design

downselected team will be invited to join the GNAO science team and will have the opportunity to submit a proposal for a science campaign with the instrument that will highlight the instrument's capabilities and scientific potential early in its lifetime. Gemini expects the resulting campaign will involve other team scientists beyond the Principal Investigator and Project Scientist.

s) Funds to support the GNAOI project are made available through the Instrument Development Fund (IDF) as defined in the Gemini International Agreement. Gemini attempts to distribute its entirety of IDF expenditures to be mindful of the baseline contributions of the Participant countries. These baseline contributions are:

US	67.2%
Canada	18.1%
Brazil	6.5%
Korea	5.0%
Argentina	3.1%

Teams should remain mindful of these baseline contributions if they plan significant external expenditures.

t) The RFP Documentation Set is made up of the following documents:

- RFP Main Document (Document GNAOI-01) [This document]
- Instructions to Offerors, including Reps and Certs (Document GNAOI-02)
- Contract Main Document, including Terms and Conditions; (Document GNAOI-03)
- Preliminary Design Statement of Work (Document GNAOI-04)

Gemini intends to release the Draft Post-Preliminary-Design Contract Amendment and Statement of Work prior to the Closing Date.

All information provided by AURA in this RFP is offered in good faith. Individual items are subject to change at any time. AURA makes no certification that any item is without error.

u) Schedule of events: The following schedule applies to this RfP. It may change in accordance with AURA's needs.

Event	Date / Deadline
Release RfP	September 17, 2019
Notice of Intent due	October 1, 2019
Proposers Conference	October 4, 2019
Proposals due (Closing Date)	November 1, 2019

Evaluation process starts	November 15, 2019
Contract negotiations start	December 6, 2019

v) Teams interested in submitting a proposal should subscribe to the mailing list by emailing gnaoi_rfp+subscribe@gemini.edu..

w) See the Instructions to Offerors for details on the proposal contents and selection process.

2. GNAOI Top-Level Requirements

GNAOI needs to fulfill the following core requirements:

1. GNAOI shall use a single 15 micron pixel HAWAII-4RG detector as its primary science detector.
2. GNAO will provide an f/32 beam to the instrument. GLAO will provide an f/16 beam. A single set of camera optics in GNAOI shall give a field of view of 85 arc seconds square with GNAO (which will correct a 2-arcminute diameter circular field) and 170 arc seconds square with GLAO (or in natural seeing).
3. Beyond re-imaging the field onto the detector, GNAOI shall also incorporate two interchangeable cold stops appropriate to the f/32 and f/16 beams to block background thermal flux.
4. For alignment purposes, GNAOI shall provide a means to image the pupil onto the detector.
5. GNAOI shall operate between the 0.9 μm cut-on of the GNAO beam splitter and 2.4 μm.
6. GNAOI shall Nyquist sample GNAO MCAO corrected f/32 images at 1.65 μm by using a single image scale of 20 milliarcsec/pixel.
7. The f/16-pixel scale will be double the f/32-pixel scale; a single set of camera optics shall be used for both.
8. GNAOI shall generate a root mean squared (RMS) wave front error of < 65 nm.
9. GNAOI shall provide a means for measuring non-common-path wavefront errors at the GNAOI imager detector.
10. GNAOI shall contain a complement of broad-band and narrow-band filters, TBD, to support a broad range of science applications.
11. GNAOI shall have an optical throughput exceeding 50% for all wavelengths within the range 0.9 - 2.4 microns, excluding the detector.
12. GNAOI shall include optics for viewing its internal cold stop that can be inserted without disturbing the nominal imager optics.
13. GNAOI shall be able to position and readout an on-detector guide window anywhere on the HAWAII-4RG for use as an on-instrument wavefront sensor..

3. Proposers Conference and Notice of Intent

a) **Proposers Conference**

i) AURA will hold a Proposers Conference to provide a forum to review and clarify the RFP material and encourage potential proposers to ask questions regarding the RFP Documentation Set. Proposers may attend in person or via video conferencing.

ii) Attendance at this conference is not required to submit a proposal; however, Gemini strongly encourages teams to attend. Notification of attendance should be made to the AURA Contracts Officer (see Section III 4a in Instructions to Offerors).

Conference Date:	October 4, 2019
Conference Time:	9 AM MST
Conference Location:	Tucson, Arizona

iii) Information regarding the Proposers Conference site location, agenda, and video conferencing connection details will appear on the www.gemini.edu/gnaoi-rfp web site at least 7 days prior to the Proposers Conference.

b) **Notice of Intent**

i) Proposers should send a Notice of Intent to submit a proposal to the AURA Contracts Officer by the date in the event table in Section 1. Include in the email the following:

- A synopsis of the proposed project (an abstract of 500 words or less).
- A point of contact for communications.
- A list of proposed Key Personnel, including the PI(s), Project Manager and all senior personnel expected to be involved in the project.
- A list of the proposed project team member organizations including all known potential subcontractors, collaborators, and partnering institutions and their roles in the project.

ii) AURA will use the Notices of Intent to ensure reviewers have the appropriate expertise and are not demonstrably conflicted.

iii) Not receiving Notices of Intent may delay the evaluation and selection process.