

Announcement of Opportunity No. N231804
Wide Field Fiber-Fed Optical MOS (WFMOS) - Feasibility Studies
Gemini Observatory
Issued: 19 December 2003
Proposals Due: 31 March 2004

The Association of Universities for Research in Astronomy, Inc. (AURA), acting as the operator of the Gemini Observatory, announces the opportunity to conduct feasibility studies of a Wide Field Fiber-Fed Optical MOS (WFMOS) that may be used at Gemini early in the next decade.

In the near future AURA will be issuing a Request for Proposal to those institutions which submit a letter of interest in response to this announcement of opportunity (see below). This Request for Proposal will seek detailed proposals for conducting feasibility studies for the WFMOS, and proposals will be due on the date given above. The total funding available for these studies is USD 200,000, which includes funding for both direct and indirect (i.e., the equivalent of overheads) costs. Gemini hopes to use this funding to award more than one feasibility study contract so that there are competing teams. It is anticipated that the feasibility study phase will start in April 2004 and be completed approximately eight months later. The studies will include optical, mechanical, electronic, and software design elements, as well as an evaluation of the scientific applications for a WFMOS, at the level needed to demonstrate the technical and scientific viability of such an instrument. The studies will also be used to define a cost estimate for building such an instrument.

Subsequent to completion of the feasibility study phase for WFMOS, Gemini will consider launching a set of competitive phase A design studies, leading to the commitment to build a WFMOS, assuming the cost, technical risk, and scientific feasibilities assessed during this initial stage are satisfactory. A commitment to build a WFMOS for Gemini will not be made until the results of the other (ExAOC, HRNIRS, and GLAO) studies are evaluated and funding options for all proposed new Gemini instrumentation are better defined.

WFMOS Description

The WFMOS is expected to provide $\sim 0.39\text{-}1.0\ \mu\text{m}$ spectroscopic observations of $\sim 4000\text{-}5000$ point sources simultaneously when used on Gemini. The basic instrument concept relies on the use of a prime focus array of remotely positioned fibers that feed a large bank of spectrometers located off the telescope. This prime focus concept is driven by constraints of the existing $f/16$ configuration of the Gemini telescopes, which cannot provide sufficient field coverage for a spectrometer with such a large multiplex gain. Given the novel mass and space constraints, interface requirements, and top-end handling procedures (compared to a typical Gemini Cassegrain mounted instrument), assessments of the technical feasibility for WFMOS must rely upon close interaction with the Observatory.

The baseline performance requirements for the WFMOS include –

Wavelength Range: $0.39 - 1.0\ \mu\text{m}$

Field of View: ~1.5 deg

Spatial Sampling: ~1 arcsec fiber entrance

Spectral Resolution: $R \sim 1000 - 30,000$

1-shot wavelength coverage: ~0.4 μm (lowest resolution mode)

Simultaneous Stellar Targets: 4000-5000

The basic instrument concept envisioned is similar to the [KAOS](#) design, though alternative designs which meet the top level performance requirements summarized above will be considered as well. Teams interested in participating in feasibility studies should give careful consideration to the science applications planned for the WFMOS and provide as part of their study reports independent assessments of the scientific feasibility of key research (e.g., dark matter, dark energy, and galaxy formation) with WFMOS. Gemini requires this scientific component of the feasibility studies because the anticipated cost and risk of WFMOS is expected to be large and a thorough examination of the key [science applications](#) possible with such an instrument is prudent, before a commitment to build it is made. Given the enormous data sets generated with such an instrument, the WFMOS should be delivered with pipeline processing software as part of the overall instrument package and the cost and technical issues associated with such a pipeline should be included as part of the feasibility study products. Modifications of these study guidelines based on scientific, technical, or cost considerations will be considered through the feasibility study phase of the program.

Use of Existing Designs

Gemini in general promotes the use of pre-existing designs when developing new instrumentation. The use of such component designs help reduce costs, deployment times, development risks, and maintenance demands of Gemini's facility instruments. Accordingly detailed mechanical design information about NIRI, GNIRS, GMOS, and possibly other Gemini facility instruments will be made available to interested design teams when Requests for Proposals are distributed. Teams may propose to use alternate designs for any subassembly but will be at a competitive disadvantage in the evaluation process if it is practical to use a pre-existing design from a Gemini facility instrument instead.

Process for Submitting Proposals

Any National Gemini Office (NGO), collaboration of NGO's, institution, or company within any Gemini Partner country is entitled to propose for the development of one or more feasibility studies of the WFMOS.

Interested parties are asked to submit Letters of Interest to the contact address below. A Request for Proposal will be sent in response to all Letters of Interest received.

Interested teams should not begin work on their proposals until they have received the actual Request for Proposal document, which contains specific instructions regarding the content and format of proposals.

Letters of Interest or inquiries should be sent directly via conventional mail or e-mail to:

AURA-Gemini Observatory
950 N. Cherry Ave
Tucson Arizona 85719 USA
Attn: Andrew Flach, Gemini Contracts Manager
Phone: 520-318-8410
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Please reference "RFP No. N231804 - WFMOS" in your letter of interest.