J. Anthony Tyson
Director, LSST
908-582-6028
908-582-3260 FAX
tyson@physics.ucdavis.edu

LSST CORPORATION

4703 E. Camp Lowell Dr., Suite 201 Tucson, AZ 85712 URL: www.lsst.org Phone: 520-571-1111 FAX: 520-571-1119

Research Corporation • National Optical Astronomy Observatory • University of Arizona • University of Washington

December 5, 2003

To Whom It May Concern:

On behalf of the Large Synoptic Survey Telescope (LSST) project team and the LSST Corporation, we invite your company to participate in Phase 1 of the process for development and construction of the LSST imager modules.

LSST Inc. is a 501(c)(3) non-profit corporation, formed to create and operate the Large Synoptic Survey Telescope, an 8 meter class wide-field survey telescope, designed to perform repeated sky surveys in order to identify and define very faint time varying and transitory objects.

LSST is soliciting manufacturers and suppliers of Hybrid CMOS and CCD arrays for construction of the LSST imager modules. The optical imager will be over 2.3 billion pixels (approximately 10 micron) covering a circular focal plane of over 55 cm diameter. It will represent the largest imager ever made. Information regarding the LSST project may be found at http://www.lsst.org.

If you would like to respond to this Announcement of Opportunity please submit a letter of intent to the address indicated below. The deadline for receipt of Letters of Intent is January 1, 2004. Letters should be submitted by email and paper copy. Acceptable formats for electronic submission are plain ASCII text, or MS Word. This letter should include a description of the device the vendor proposes to ship for evaluation.

Send Letters of Intent to: J. Anthony Tyson tyson@physics.ucdavis.edu
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Tucson, Arizona 85712

The process for procuring and evaluating the modules for this imager will be spread over three phases.

Phase 1 begins with this Announcement of Opportunity. Included with the Announcement of Opportunity are the specifications for the imager modules. In Phase 1 vendors should first send only a Letter of Intent together with specifications for the device they plan to submit for evaluation. Vendors who respond to the Letters of Intent will be asked to supply detailed specifications (in the format of the accompanying spec sheets) of the device they plan to propose for Phase 1 by February 1, 2004. Vendors who supply an accepted specifications

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sheet will be required to provide two samples of their existing devices, which come closest to meeting our specifications, to our testing lab. A no cost agreement will be negotiated with each vendor for the loan of these two current generation imager modules. The deadline for receipt of the devices from all participating vendors is March 30, 2004. The devices will be returned after completion of the testing (approximately three months after the delivery deadline). All test results will be kept strictly confidential. Outside the project team, test results for each device will provided exclusively to the vendor supplying the device.

An integral final part of Phase 1 will be a visit to successful vendors' facilities by the LSST technical evaluation team. Phase 1 will end with evaluation by the team and a decision to proceed in developing the detector modules with vendors whose devices show promise (possibly through further modest changes and enhancements) of meeting the full LSST imager module specifications.

In Phase 2, LSST will work one-on-one with the vendors selected at the end of Phase 1 to modify their arrays, if necessary, to meet the program specifications. A funding budget will be available for each vendor contract, and there will be milestones for device delivery and evaluation. Upon conclusion of Phase 2 the Project Team will narrow selection to no fewer than two vendors.

In Phase 3, LSST will contract with the vendors selected in Phase 2 to deliver their best parts for demonstrating the capabilities required for the LSST imager. We will also require a manufacturing plan that demonstrates the ability to produce and qualify components in volume and quality to match the requirements of the large focal plane required by LSST.

LSST will test the submitted parts and evaluate each vendor's manufacturing capabilities to make the final award at the end of Phase 3. It is important that each vendor recognize the scope of work involved in successfully producing the number of required devices. For 10 micron pixels and 4K x 4K devices, this would be 220 arrays, plus spares. For 2K x 2K devices, LSST would need 880, plus spares. There is currently a possibility that the LSST focal plane will be enlarged to 3.5 degrees (3.1 billion pixels). This will, be determined within the next few months. If expanded, the number of 2K x 2K devices, for example, would increase to 1200, plus spares. The milestone for delivery of all devices, including acceptance testing is 2008. LSST will work with the successful vendor on the most cost effective approach to QA. Based on technical evaluation and cost, award of a Contract will be issued to a single vendor for acceptance testing and integration.

All testing will be accomplished at an independent lab not associated with the LSST project.

Attached are the specifications for the LSST imager module and test protocols that will be used. Each spec has been left as open as possible, consistent with the LSST science requirements. The specification sheet attached is for either hybrid CMOS arrays or CCDs, depending on your company's focus. In the case of CCDs, it is highly desirable that the device be a high fill factor array of small (512 x 4096 or smaller) CCDs independently controlled and read out in a highly multiplexed fashion. Each vendor should propose a product that will meet or

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exceed these specifications, while best suiting their own product format and business capability. The method by which the CMOS readout chip is attached to the imager module (hybrid, connector, etc) is left to the vendor. We invite early comments from each vendor on these specifications. Comments may be sent to tyson@physics.ucdavis.edu

We look forward to working with you. If you have any questions, you may contact me at (908) 582-6028 or email to the address indicated above.

Sincerely,

J. Anthony Tyson

Enclosures