LBTO Needs for Partner Contributed Resources

The following is a prioritized list of projects for which LBTO would benefit from the contribution of skilled personnel from partner institutions. The document is intended to form the basis for discussion for the mechanism by which such individuals could be provided, after matches are found for particular efforts. The current status is that prospects are being explored; in many cases funding support has not yet been identified.

1. Commissioning observing. The task is for commissioning of focal stations and characterizing the performance of the telescope + AGw units. First is completion of SX direct with AGw Unit#4 this coming fall, the internal MODS AGw unit in the winter, and AGw#1 with the (flattened) AO secondary in the spring. Tasks include test plan development, data acquisition with the telescope, and data analysis/image quality assessment. Need: one or more astronomers with experience in observing and data reduction, up to two weeks per month.

Prospects: Jochen Heidt for telescope commissioning from LBTB and possibly a graduate student from OSU.

2. ARGOS platform design. LBTO is responsible for the design of a platform near the top of the telescope for access and servicing of key components of the laser launch telescope system. The current strong emphasis on completion and commissioning of basic telescope subsystems does not create an obvious window for LBTO Engineering to meet the ARGOS team schedule requirements for CDR next spring. Need: 4-5 weeks of Mechanical Engineering effort.

Prospect: U of Arizona mechanical engineer who has been working on the design of the laser launch telescope.

3. Improved thermal performance and control. Rapid ambient temperature changes cause periods of focus and collimation instability, compromising image quality and adding considerable overhead. A multi-phase multi-year project will be required for ultimate success; it won't receive a major allocation of internal resources before 2011, but acceleration of some aspects could have a big impact in improving performance. The first approach is to look for correlations between measures of structural temperature gradients and required optical correction, to speed up convergence with the active optics. Need: student or astronomer to work with John Hill on analysis for one or two semesters. If clear measures of gradients are identified, a next step could be to experiment with in-dome ventilation patterns to reduce those gradients as rapidly as possible: Need: astronomer or system engineer to define experiment + astronomer or student to analyze results. The major step is design of the "Stealth" system for insulation and circulation of conditioned air around the telescope steel

structure: Need: Mechanical Engineer, System Engineer, Thermal Engineer, Mechanical Draftsman.

Prospect: Roland Gredel will explore whether it is possible to get some help from the experts at Calar Alto who worked on their thermal control issues.

4. Primary mirror covers. This request is to provide help to Piero Salinari to turn the successfully reviewed conceptual design into a preliminary design for ultimate implementation. Need: Mechanical Engineer (8 weeks?)

Prospect: Piero Salinari will identify a mechanical engineer to move the project forward.

5. Tertiary mirror rotator control system upgrade. The systems as delivered perform unreliably in terms of start-up and repositioning. The task is to analyze the problem and redesign the system as needed. Need: Electronics Engineer (4 weeks).

Prospect: Simone Esposito will contact ADS about the problem.

6. Tertiary mirror unit covers. These have not been designed or implemented, and would provide protection during shutdown and periods of prime focus only observing. The intention is for a design with manual placement and removal. Need: Mechanical Engineer (2 weeks).

Prospect: Simone Esposito will contact ADS about creating the design.

7. Set up of mask making unit and associated tracking system. The commercial laser cutter will be delivered this fall, and local technicians will be trained by service personnel from the company. The required tasks are to set up the protocol and system for mask production, identification, quality control, transport to the mountain, tracking, and storage. Need: Astronomer, Mechanical/Systems Engineer.

Prospect: Simone Esposito will contact Paolo Vettolani for someone with ESO MOS experience. Mark Derwent from OSU will continue to be involved.

8. Visitor gallery redesign. The LINC-NIRVANA dewar must be installed and retracted through the current Visitor Gallery area, but requires much more clearance than the current doors allow. The task is to redesign the area with doors or panels that retract to allow sufficient clearance. Need: Mechanical engineer (3-4 weeks).

Prospect: U. of Arizona mechanical engineer.

9. DIMM software completion. Jose Borelli tells us this task is very close to complete, but it needs sufficient automation to make only a small claim on the telescope operator's time. Need: Software Engineer.

Prospect: Jose will continue and complete the work as time permits. Note that in this case, credit will be sought for the total DIMM project, including this last effort.

10. Implement the MASS instrument to accompany the DIMM. Andrei Tokovinin supplied a MASS (that provides vertical atmospheric turbulence profiles) to Piero Salinari, but it must be tested, calibrated, and integrated with the LBT. Need: Mechanical Engineer, Software Engineer, Astronomer.

Prospects: Roland Gredel will participate and draw on a group from Nice with experience in MASS/DIMM calibration. Rick Pogge will explore whether an OSU grad student is interested in this aspect of site characterization.

11. Completion of LBTO weather station to provide reliable wind velocities. Need: Instrument Engineer.

Prospect: U of Arizona engineer.