

6) Preliminary 2011 Plan

The detailed plan of work for 2011 has not yet been developed; it will be presented as the Program Plan at the fall meeting of the Board. The list of activities is, however, already reasonably well understood, and will be subject primarily to arrangement in time subject to resource availability and priority.

Technical Projects

- **Mirror Covers.** The LBTO mechanical engineering group will pick up the conceptual design developed by Salinari, Miglietta, and Anaclario for modifying the existing covers. They will develop a preliminary design, which will be reviewed, after which the project will proceed to completion with its budgeted supplementary funding.
- **Vibration Mitigation.** As discussed in the context of Adaptive Optics, the telescope itself may limit the ability to correct distortions because of its vibrational modes. A very likely high priority candidate for reducing vibrations is damping of the swing arms holding the secondary units. This project must be done with care, so as not to affect adversely the current level of reproducibility of positioning. Once basic telescope issues are completed, this project has highest priority for improving performance.
- **Thermal management.** The goals for 2011 are further data collection and analysis, and project definition. Automated data collection of laser tracker surveying of the position of the primary mirrors during times of thermal instability will be initiated in 2010. Such data will be collected over the full range of ambient temperatures. The first approach to mitigation will be improvements to the pointing models as a function of temperature and time gradient of key temperature samples. A comprehensive approach will define an overall strategy and prioritize projects and operational procedures to be executed in order of greatest impact. Rework of the stealth fans, creation of C-ring extension insulation, development and implementation of enclosure cooling are all options to be investigated.
- **Software.** The highest priority is to complete development and commissioning for full binocular mode, with the end goal of AO deployment. This will also be a critical year for transitioning responsibility for instrument software to the LBTO group.

Partner-Supplied Capabilities

- **LUCIFER2.** Lab acceptance testing is scheduled for December, 2010. Installation could start in February, should the action item list be small, with on-sky commissioning going forward in mid-2011A. The intention is to mount LUCIFER2 on the DX side with the already commissioned AO Unit#1. When basic commissioning is complete, AO mode can follow immediately.
- **AO2.** Lab acceptance testing for Adaptive Optics Unit#2 is also anticipated near the end of the current year. It will be reintegrated in the Mountain Lab (either before or immediately after LUCIFER2, depending on the timing of

- completion), and will be mounted in place of the rigid secondary on the SX side. MODS1 will be moved to the DX Direct Gregorian focus for science observing, and the IR Test Camera will be mounted with AGW#1 on the SX Direct Gregorian for commissioning. A critical prerequisite is on-sky commissioning of that focal station with the IRTC and AGW#4 prior to moving MODS. Should the commissioning of AO1 and MODS1 be completed in 2010, we would have the first two technical blocks of 2011 for that activity. When commissioning is complete, we will pull LUCIFER1 and AGW#3 from the SX Front Bent Gregorian, install AGW#1, reverify briefly with the IRTC, and remount LUCIFER1 for its AO mode commissioning.
- **MODS2.** Lab acceptance testing is scheduled for June, 2011. The instrument could be installed on SX during early 2011B, when AO commissioning is completed, to complete its own commissioning program, possibly by the end of the year.
 - **PEPSI.** The team intends to bring equipment to their lab in the base of the pier starting in mid-2011.
 - **ARGOS.** Telescope infrastructure work will proceed, for cooling, services, and platform installation, in advance of the instrument arrival in 2012.

6) Long-Range Plan

The long-range plan is considered to comprise the technical projects and on-sky technical observing demands for 2012 and 2013.

Technical Projects

- **Vibration Mitigation:** This project will be live and ongoing through the duration of the long-range plan period. As the interferometers enter routine operation, the demand for “quiet telescope” mode will increase, as will the desire to limit vibration amplitudes even more strictly. Structural damping, rotating bearing rework, and control of on-telescope sources will be aspects of this plan as it develops.
- **Thermal Management:** The long-range plan period will see the execution of the phased aspects of thermal control of the mount and enclosure environment. As in the previous section describing the project definition, this is likely to include implementing the “Stealth” insulation and ventilation system as well as upgrading the enclosure thermal conditioning.
- **Primary Mirror Surface Management:** A number of upgrades are needed for cleaning and recoating the primary mirrors. The aluminizing control system will be upgraded (in collaboration with OSU) and a wash station will be implemented that will cut days off of each primary mirror wash.
- **Software:** The emphasis is likely to be on ongoing handover of instrument systems from their team developers to the LBTO software group. In addition, a transition to an externally developed middleware system is anticipated, along with starting the transition of partner-supplied software to a common protocol.
- **Completion of System Commissioning:** Technical nights in Semester 2012A would accommodate time remaining for MODS2 (if any), and be concentrated on binocular AO performance in a range of thermal conditions.

Partner-Supplied Capabilities

- **ARGOS:** The laser guide star system is scheduled for installation during summer shutdown, 2012, with commissioning to follow in 2012B and some extension likely to 2013A.
- **LINC-NIRVANA:** The near-IR interferometer is also scheduled for installation during summer shutdown 2012, and will be commissioned over the following two+ semesters.
- **PEPSI:** Some PEPSI commissioning time (available from their providing AGW Units to LBTO) is likely to be assigned in 2012A.
- **Next Generation Instruments:** The milestone of completion of Phase 1 of LBT development is scheduled for Semester 2012B. A development program of 10 years for a major new instrument would have that capability replacing instruments that will have been in service for more than a dozen years. Revisiting the Ringberg project list will be essential in this time frame to maintain the vitality of the facility.