

arcminutes. The beam is sent to the wavefront sensor by a beamsplitter, and brought to an f/100 focus. The wavefront sensor sample the telescope pupil with 19 sub-apertures using a lenslet array.

A mechanical design of the Bonnette has been completed by W. Grundmann of the Dominion Astrophysical Observatory. The diameter of the bonnette is slightly over one meter, and the thickness is 280 mm. At the moment, design of the mounts for the optical components is underway, and there is considerable interaction taking place between the different partners (CFHT, DAO, LASERDOT, and OPM) to ensure that all components will indeed fit in the enclosure.

DAO is also developing the Curvature Wavefront Sensor for the AO Bonnette. J. Stilburn has been involved in the realization of the components and the definition of the interfaces with the control system. The group of F. Roddier (Institute for Astronomy – U of H) is acting as a consultant to DAO for the design details of this particular component, and provides advice in general on the whole system (See the article from Dr. Roddier on the adaptive optics system of the University of Hawaii, in the section Latest News on Instrumentation).

The French company Laserdot is fabricating the 44 actuator piezo-stack mirror for our system and developing the control software of the AO Bonnette – at this stage mainly the closed-loop control of the deformable mirror using signals derived from the wavefront sensor. Many simulations have been carried out to study different aspects of the system including closed-loop bandwidth, the interactions of the curvature sensor and piezo-stack mirror, the design of the off-line Shack Hartmann sensor for flattening the deformable mirror, etc.

Meudon Observatory is studying a solution for the system's tip/tilt mirror which is a separate component from the deformable mirror. P. Gigan is designing a tip/tilt mount driven by 4 linear magnetic motors for the f/20 paraboloid mirror to be used for tip/tilt correction. Another solution also envisioned would be a commercial momentum-compensated piezo-stack tip/tilt mirror sold by the German firm Physik Instrument.

Concerning management of the project, a Kick-Off meeting took place at DAO last February to define the project and the task sharing between the various partners. On May 20-21, preliminary studies were presented to CFHT by Laserdot, Meudon Observatory, and DAO, at the Laserdot headquarters in France. Next August a Milestone 2 meeting will take place at CFHT Headquarters in Waimea to review the detailed design studies of the contracting parties. If CFHT is satisfied with the results of these studies, the contracts for fabrication will be issued shortly thereafter.

*R. Arsenault, D. Salmon*

## Redeye Project Status

At the time of this report the infrared camera project is in a rather dynamic state, with final integration of essentially all components in progress. In late March we received the LiF and BaF<sub>2</sub> lenses needed to complete the cold reimaging optics, and will complete acceptance tests of the two cryostats in late May. We recently ran a bare NICMOS3 multiplexer with the new Generation III controller under development at CFH, paving the way for final tests of our engineering grade NICMOS3 array and

ultimately a science grade device. All of these efforts are being driven in the near term by a June engineering run with one of the cameras. Barring unforeseen problems that prevent us from making tests on the sky, we will distribute through e-mail to the Community the results of our engineering runs in June and August. Such performance characterization will allow future users to design observing proposals for the new cameras. We currently anticipate commissioning the cameras for use at the Cass focus by 1 January 1993, in time to support runs throughout next semester.

*D. Simons & C. Clark*

## MOS-SIS Progress Report: Release for General Use Scheduled for 1st Semester 1993

### Highlights of the Past Six Months

Since the last information bulletin a great deal of activity has been taking place around the MOS-SIS imaging spectrograph. Integration of the instrument has been completed at DAO, with frequent trips of CFH personnel to DAO for active testing. As compared to what was announced 6 months ago, we have experienced a two month delay in shipment to CFHT due essentially to two problems, one with the control software, the other with the MOS camera optics. After this first problem was solved, the MOS-SIS plus auxiliary equipment (handling cart, test bench) was shipped to CFHT. Since then the MOS-SIS has been put back together (it was shipped in sub-assemblies), and brought up to the observatory 5th floor for integration into our operations. The MOS-SIS has successfully been installed on the Cassegrain focus and successful communications between the dedicated control system and both our main control computers and the TCS has been obtained. The SIS optical train alignment was checked out and found not to have suffered from shipment. Figure 10 shows the first multi-spectra image taken on the sky in June, 1992, while Figure 9 shows one of the spectra. The last major missing optical component has at the time of this writing finally been completed: the MOS camera aspherical lenses were successfully manufactured by APS and subsequently glued.

### Problems and Solutions

One serious problem discovered in the control system while testing proved difficult to track down and solve: occasional crashing of the control software was occurring at a low but definite rate of 1 motion failure over 30 requests. After much effort by DAO/CFHT and external experts, the problem was finally identified and solved. In parallel, the MOS camera optics was being redone by the Applied Physics Specialty (APS) company. Due to the unusually curved aspherics, a first attempt by another company resulted in optical elements largely out of specifications. APS efforts included several attempts at surfacing the aspheres spread over several weeks, and as of today, we are delighted (and relieved) to report that APS successfully surfaced the surfaces close to specifications and that all elements were successfully glued together at APS with DAO guidance.