MOS/SIS Project Status

By the time you read this article, a good fraction of the mechanical assembly of the MOS/SIS spectrograph will be on its way to DAO, Victoria. This focal reducer type instrument (description in Bulletin #20) will have two ports, one for long slit and multi-aperture spectroscopy over large fields (10' diameter) at low to medium spectral resolution (MOS), the other for slit spectroscopy at high spatial resolution with atmospheric seeing compensation from an active mirror.

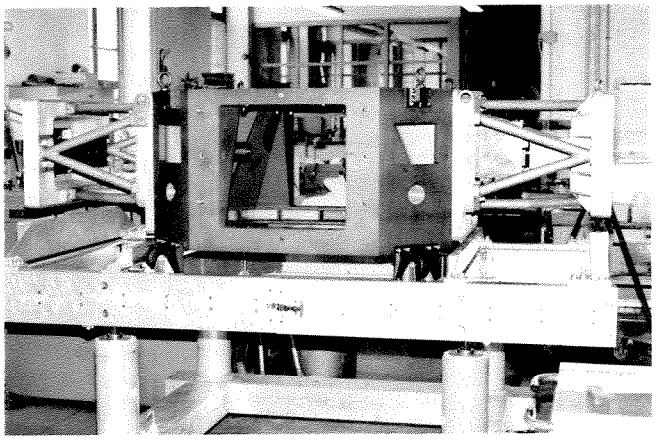

Figure 4: The MOS/SIS spectrograph mechanical structure being assembled in the Paris-Meudon workshop (June 1990). One can identify the central octagonal structure, with the MOS and SIS structures installed on two symmetrical ports.

Most of the work that was contracted to the Paris-Meudon Observatory under the responsibility of P. Felenbok, is completed. The central mechanical structure (octagon), the MOS and SIS structures, as well as sub-units like the central mirrors slide, filter and grism wheels, mask/slit holders, have been completed. The MOS and SIS optical lenses have been successfully manufactured by Arnolds Optics and Applied Physics Specialties in Canada, and were anti-reflection coated in France by MATRA. They are currently being cemented in Canada, before being installed in their mechanical mounts at DAO.

The integration phase will be in full swing by the beginning of February in the DAO workshops, under the responsibility of D. Crampton. First the MOS path will be assembled, then the SIS, followed by extensive testing. CFH staff members will be visiting DAO at frequent intervals for acceptance tests. The final integration of the whole instrument, including the control software, will end early in the fall of 1991 at DAO. In the mean time, the user interface will be designed at CFH with several key features that are already in operation, like accurate offsets and instrument/telescope fast focussing. We expect to receive the instrument at CFHT shortly after final integration at DAO to work toward the instrument's commissioning.

Olivier Le Fèvre and Guy Monnet

First Light With Lick1 2048x2048 CCD

On November 5 the Lick1 2048x2048 CCD saw first (star) light. While the weather was less than perfect, the images generated were outstanding. Mounted at prime focus with FOCAM this CCD offers a field of view of about 7x7 arcminutes at 0.2 arcseconds per pixel (15 micron pixels).

The Lick1 CCD was fabricated at the Ford Aerospace foundry and behaves much like PHX1 or SAIC2. The uncoated chip operated as a front-side imager and shows a quantum efficiency quite similar to SAIC2. Data is linear up to the chip's current full well of about 60,000 electrons.

While this device is quite clean cosmetically (only a few column blemishes — all near edges, and some low-level traps), there exists a number of challenges to it becoming a "work-horse" chip:

- the readout time is excessive at ~5 minutes per frame.
- it is not possible to readout more than one amplifier (the chip has 4).
- subarrays in the x (row) direction are not possible.
- increasing readout rate degrades serial transfer efficiency.

These problems will not be solved until the deployment of next-generation CCD controllers under development now.

Future plans for this device include faster readout rates using multiple amplifiers, access to the chips ultra low-noise amplifiers (skippers), increasing the full well, and upgrading the QE response with a blue-sensitive coating.

LICK1 2048x2048 CCD Specifications

- ~12 electrons Read noise (target ~ 6 electrons)
- ~60,000 electrons full well (to be increased)
- ~40% peak QE at 6500 Å
- ~10e-/pixel/hour at -95°C (MPP operation)
- Better than 1% linearity to full well

Christopher Clark and Olivier Le Fèvre

LAMA Mask Selection Software

With the introduction of the laser machine (LAMA) as a replacement for the aging punching machine (PUMA), the software group has taken the opportunity to improve the mask selection tools. Beginning with the SAOimage code from the Smithsonian Astrophysical Observatory, we have extended it to allow interactive selection of masks.

All the functionality of SAOimage has been retained: color lookup tables, pan, zoom and scaling. Our additions have centered on a new menu level which provides all the tools necessary for mask definition. In each mask to be cut, the astronomer may define circular holes, slits and curves. Further, for each mask the dimensions of each type of cut is separately definable.