

## Staffing at Magellan–Report of the SAC to the Magellan Council

At its September 2003 meeting the Magellan Council considered several aspects of the staffing of the Magellan telescopes at the Las Campanas Observatories. The Council asked the Science Advisory Committee (SAC) to consider how the number and the type of personnel impact Magellan scientific productivity. Although the Council initially concerned itself with the FY 2004-2005 budget, it asked the SAC to work with Magellan Technical Manager Alan Uomoto to project the staffing requirements over the next five years.

Mark Phillips and Alan Uomoto's presentations at the November 2003 SAC meeting provided the basis for our discussion. The present complement of Magellan personnel, an organization chart, and a comprehensive list of tasks remaining to be undertaken or completed were presented and discussed. Some in the SAC expressed concern in the lack of depth at various positions: some essential know-how is vested only in single individuals. Because the staffing level has little margin, there are periods when no particular technical support – hardware and/or software – is available. Uomoto and Phillips expressed particular concern that little headway was being made on the surprisingly long list of tasks that had accumulated in the first few years; even after the present (atypical) period of commissioning three new instruments is over, the expectation is that the present list will take several years to complete, even ignoring the likelihood that there will be additional challenges and new instruments that will add to it.

Uomoto identified three problem areas specific to the telescope systems that have continued to absorb considerable attention: the instrument rotators (Nasmyth and Cassegrain), the guiders (both mechanics and camera systems), and the primary mirror support system. Issues with these systems require so much time that, when added to the routine tasks of instrument changeovers and regular maintenance, there is little time left for other less pressing problems. One result of this is that, in the commissioning of IMACS in August and September the technical staff was often engaged elsewhere and had little opportunity to learn about the new instrument.

A technical support person is divided between routine operations and tackling chronic problems such as the rotator malfunctions. The SAC heard that, at best, the technical support staff was fully engaged just keeping the telescopes and instruments working, and that the small fraction of “down time” is a testament to the quality and dedication of the staff, many of whom, however, are pushed to an unsatisfactorily stress level.

The increased attention from the Pasadena part of the operation – the hiring of Alan Uomoto, the greater availability of Alan Bagish and Charlie Hull – are anticipated to improve the present situation. In addition, the plan to add a high-level engineer or scientist to help Frank Perez in telescope operations is considered a crucially needed step. It was pointed out that these personnel can form the core of “tiger teams” that would concentrate on difficult, persistent problems. Uomoto believes that if these three areas of ongoing difficulty could be resolved, the ability to deal with the long list of other tasks would be much improved. The SAC agreed that within the present constraints, it is inevitable that some compromises will be made in observation configuration to minimize changeovers. In some cases these can be relatively benign, for example trades across telescopes, but in other cases an acceptable but less-than-ideal configuration, for example, the conversion of a two-night  $f/4$  run on IMACS sandwiched between two  $f/2$  runs, may become unavoidable.

Uomoto also reviewed with the SAC the long list of instruments and systems (such as the F/5 correctors and secondary) that will arrive at Magellan over the next five years. Even with

disciplined prioritization, it is difficult to believe that this impressive list of coming capabilities – about which we can be very pleased – can be absorbed by the current staffing level. It was Uomoto's opinion, and the SAC agreed, that to operate these new capabilities required an increase in technical personnel at the level of approximately 30% - both in Pasadena and Chile – over the next five years. Included in these new hires should be some appointments in Chile of people with advanced engineering skills who would be capable of directing efforts to troubleshoot or upgrade systems, activities that are typically directed from Pasadena at present. Furthermore, the commissioning of all these systems made clear the necessity for more support astronomers. They provide the interface between the instrument builder, the observatory staff, and the observers; particularly in the first year of operation their contribution is crucial. With the long list of instruments and systems on the way, a total of about 4-5 support astronomers would be needed if all were delivered.

Apropos of the financial implications of the need for increased staffing over the next five years, two important points were made. Matt Johns pointed out that, in addition to the operations budget there are three other sources of funding that might be tapped if a cogent argument can be made. These are: the Construction Budget; the Improvement Fund; the Emergency Fund. The continuing issues with the rotators, guiders, and mirror supports are clearly telescope problems; it could be argued that a temporary increase in technical personnel to deal with them could be drawn from one or more of these funds.

A second point, made by new-SAC-member Laird Thompson, involved the anticipated complexity of the AO secondary mirror now under development. Thompson said that \$300K was identified in this project's budget for integrating the AO mirror into the Magellan-Clay operation. The intention is to hire a full-time engineer to accompany the hardware in Chile and to remain there with it for at least one year. Dressler stated that if he had it to do over again, he would definitely included in the funding for IMACS an engineer/scientist who would have done the same for IMACS. As a general principal, the SAC enthusiastically endorsed the idea that for complex equipment of this sort (of which there are of order 5 examples on the list), the addition to the Observatory's technical support group of a person dedicated to that equipment for at least a year would significantly improve our prospects for dealing with these challenges in the years to come.

Software support at LCO is also an important worry. A lot of complex engineering code for telescope operations is handled exclusively by one person (Skip Schaller) and we are vulnerable to software related failures if he is unavailable, and to instrument commissioning delays if his time cannot be optimally scheduled.

User-level computer systems administration is minimal right now by the reasonable decision to apply that expertise, provided by Schaller, elsewhere. We note, however, that a large part of the perceived success of Las Campanas has been superb visiting astronomer support. While never extravagant, solutions for almost every scientifically significant request were provided. Magellan brings astronomers with a wider range of expectations, but it is still clear that the current staffing level of 0.1 fte is inadequate and support at the 0.5 fte would be more appropriate.

Hardware support for personal computers is also handled by Skip, but a little extra help in the electronics area could free him of that task as well.

The following are suggested staffing catch up and ramp up given anticipated instrumentation and telescope upgrades in the next 5 years:

Additional staff at LCO:

2004	Telescope engineer/scientist	Backup Frank Perez. Need management support and telescope/instrument expertise when Frank is off or traveling. Higher staffing level will need more management. Immediate need. Advertising now.
	Electronics engineer/Instrument scientist	Construction and controls troubleshooting to make progress on chronic problems. Immediate need.
	Computer admin (1/2 fte)	Networking, web pages, etc. Current 0.1 fte insufficient. Immediate need.
2005	Instrument scientist	Backup David Osip when he's off the mountain. Instrument count becomes too large for one instrument scientist. Immediate need.
	Telescope operator	Additional operator to enable dayshift opportunities and double-shift winter nights.
2006	Engineer/technician	Troubleshooting new instruments and controls, computer hw support.
	Instrument specialist/scientist	F/5 preparation, more new instruments. Two instrument specialists are expected to be overwhelmed by the number of instruments at this time. May be delayed depending on instrument schedules.
2007-8	Instrument scientist	New instruments keep arriving; prep for F5 installation.
	Engineer/technician	F/5 controls, instrument support.

Additional staff at SBS:

2004	Electronics engineer	Done for FY2004.
2005	Mechanical designer/engineer	0.5 fte to start; New instrumentation needs observatory-level support; continuing work on chronic problems.