

Magellan SAC Meeting: 21-22 March 2009

Minutes

SAC Members: Edo Berger (Harvard, Secretary), Laird Close (Univ. of Arizona), Mario Mateo (Univ. of Michigan), Paul Schechter (MIT), Andrew Szentgyorgyi (CfA, Chair), Ian Thompson (OCIW)

Also present: David Osip (LCO), Frank Perez (LCO), Mark Phillips (LCO), Steve Shectman (OCIW), Alan Uomoto (OCIW), Povilas Palunas (LCO, telecon)

Alan Dressler was commended for keeping minutes during the 2008 meeting. Minutes from 2008 adopted.

The SAC congratulates Jorge Estrada for receiving his bachelor's degree.

Associate Director's Report (Mark Phillips)

No personnel changes are reported since the previous SAC meeting. Frank Perez has moved back to the US, but he is still commuting back to LCO every month. This is an interim solution, however a full-time on-site engineer is required. A search is underway for an on-site Magellan Telescope Engineer. The search is taking place in Chile mostly for ease of commute. Ideally, this position will be filled July 2009. Current candidates are from ESO / La Silla.

The Magellan Fellow program (Australia) has been renewed. Offers were made to two candidates for next year's position, and 1 alternate exists; 2 are likely to accept. The interviews were held by phone. The current fellows are staying on through August 12, 2009 (David Floyd) and late 2009 (Ricardo Covarrubias), followed by a third year in Australia.

Mateo: Has the program worked well overall?

Phillips: The overall sentiment is that the program has been successful. This year there were only 6 applicants. We think that this is a reflection of the requirement to spend 2 years in Chile, the large fraction of time spent on the mountain (2/3 service time versus 1/3 for research effort), and no guarantee of telescope time.

Berger: Should this be open to PhD holders only?

Phillips: Australia wants to hire postdocs. However, down the road it would be interesting to explore an equivalent position for Masters degrees. A PhD may be an over-qualification for the telescope work aspect of the program.

Instrumentation usage statistics: Usage has been relatively steady for the past year. There was a drop in the use of MagIC from 2008A to 2008B (20% → 4%). Dave Osip notes that about 1/3 of the nights use more than 1 instrument and this may affect the statistics since only the primary instrument is listed. This issue will be tracked with new observing reports. Paul notes that his program to track seeing should also provide "open shutter time" statistics. ~10% lost to weather, and ~1% to instrument problems. It is possible the upcoming proliferation of instruments will lead to increased downtime.

MagIC: The frame-transfer E2V CCD is not ready to be commissioned as a facility instrument (it will be a PI instrument in 2009B). Based on the overall telescope instrument deployment timeline,

it seems likely that MagIC may not become a facility instrument at any point. The SITE CCD is nearly ready to be commissioned. It takes 5 minutes to switch between the two MagIC modes.

MagE: Now operating routinely. Waiting on Council to vote on commissioning

Uomoto: the Council is waiting for written instrument report).

PANIC: Will be removed when 4Star goes on the telescope. Will not be used as a backup instrument, unless there are serious problems with 4Star commissioning, in which case PANIC would be a stop-gap instrument.

LDSS3: Has been retired as facility instrument. Still operated as a PI instrument by OCIW and Harvard.

New instruments: 4 new facility and 2 new PI instruments will be deployed in the near future. Schechter stresses that there should be uniform rules for instrument commissioning. Phillips notes that there are rules in place, and that they have not always been followed in the past. In particular, a pre-ship review should be scheduled before the instrument shipping is scheduled! Mateo asked for specific instruments that bypassed the rules. Phillips notes that IMACS was shipped with image quality problems; Szentgyorgyi notes that GISMO shipped was shipped before fixing problems that existed pre-shipping. It was decided to clarify pre-ship procedures to the instrument teams and to enforce these rules.

Port plan: Current basis for discussion is 6 ports. The SAC would like to see an increase in this number to facilitate a more flexible instrument plan.

Magellan Technical Manager's report (Alan Uomoto)

The LDSS focus encoder has been replaced, and a temperature sensor was installed to replace the use of "dome air temperature". Szentgyorgyi suggests adding this information to the FITS headers. Osip notes that this is work in progress.

The F/5 secondary arrived at LCO. Baffles will be optimized for MegaCam since wider field instruments are not envisioned at the present. A new design with smaller baffles allows them to be inserted from the back side of the primary mirror.

A clean room is being constructed on site near the support building for instrument work.

Changes in export requirements for Chile: Individuals planning to ship materials to LCO should check with Earl Harris (OCIW). Ian notes that taking material out of Chile now requires stricter import documentation. In addition, people are discouraged from hand-carrying materials. A new website with shipping instructions available at: <http://shipping.baade-clay.org>. It is the responsibility of the SAC to disseminate this information to the partner institutions.

Bibliography: ~80 peer-reviewed papers per year in 2006-2008. The list is not complete. Mateo suggests that the list should be circulated to the partners to allow corrections. The SAC notes that

Dennis Crabtree's recent compilation of papers per telescopes shows that Magellan is last among the 6-10 m telescopes. By instrument, MIKE, IMACS, and LDSS account for the largest share (in this order).

Site manager's report (David Osip)

Osip notes that while the number of papers for Magellan is not large, their impact (# of citations per paper) is actually higher than for other facilities.

Throughput on Baade improved by 13-37% (z to g band) after washing and aluminizing in Jan 2009. CO2 mirror cleaning takes place on a regular basis. On Clay, there was 19-23% (z to g band) improvement. Following cleaning, engineering time is required for telescope collimation. In case this doesn't fit within the scheduled engineering time, the first observers may lose part of the night. This should be communicated to the observers. The collimation is the same for all ports on Clay, but not on Baade.

Pointing has improved to ~2" rms (compared to 5" previously). This translates to time saving with image acquisition. Actuator #35 problems are continuing on Clay. Despite extensive testing and part replacement the problem has not been isolated.

The new guiders are still being worked out (there are some bugs and design flaws). Some unresolved issues with the Baade NASE probe#2 and Baade AUX2 probe#2. They still function properly for SH corrections. Laird asks that AO people be kept in the loop about guider issues.

Seismic accelerometers have been installed in equipment rooms. Have been triggered by humans several times. Laser mask cutting working optimally. Mask costs does not include cutter amortization. A dust monitor was installed to allow for real-time monitoring and dome closure decision. Software work continues on mirror control, guiders, TCS.

F/5 October engineering fit test were satisfactory. April 2009 will be first light for the F/5 secondary and the wide field corrector.

A new latch on IMACS results in a more rigid placement of the IFU, masks, GISMO. A new IDL quicklook tool and pipeline reduction scripts installed for MagE. The new blue-side CCD on MIKE works properly. New filters and dark slides installed for PANIC.

A new problem reporting software system, JIRA, was installed. It allows reporting and tracking of problems, as well as tracking of work efficiency.

Staffing is matched to the current 6-port plan. The Magellan fellows are essential for telescope operations. It was suggested that some specialized tasks be contracted out rather than handled by full-time personnel.

Patricia Villar no longer works at LCO, and has been replaced by Pamela Rojas. Francisco Figueroa is now in charge of mountain operations (rooms, transport). Both Pamela and Francisco are fluent in English and work Mon-Fri.

MagIC (Paul Schechter)

E2V chip configured for frame transfer operation fast, for high cadence observations and precise timing, especially for planet transits and solar system occultations. SITE chip is currently used primarily for planet transit observations. New software has been installed (LOIS runs the CCD; LOUI is the user interface software and allows frame stare mode in which no time is lost to readout). LOUI is not ready for general use due to complex user interface and bugs. E2V is considered a PI system. Users should contact Paul Schechter and will need an expert user on-site from MIT. SITE may be commissioned as a facility instrument. However, it is unlikely that E2V will be commissioned as facility instrument before MagIC is permanently consigned to PI status with the arrival of FIRE.

AO (Laird Close)

The AO system will deliver an F/16.16 diffraction-limited beam to optical and mid-IR cameras. The optical camera will have a fast-readout E2V detector that can provide visible AO.

The Adaptive secondary mirror (ASM) will use the F/11 mount points, and will be mounted and dismounted with a jib crane. It has a triangular strut system to reduce the emissivity at 10 microns.

The Nasmyth port assembly includes a peripheral wave-front sensor (PWFS), an optical AO CCD, and MIRAC4 (10 micron imaging spectrograph). A dichroic will send <1.2 micron to the visible CCD, and >1.2 micron to MIRAC. The visible AO and MIRAC can operate at the same time. The clearance of the instrument from the Nasmyth platform is only 3 inches.

Progress since last 2008 SAC meeting includes two site visits to Magellan by the AO group, a site visit to Italy to work out contracts with Arcetri Observatory, Microgate, and ADS, successful PDR held at Steward in Dec. 2008 (electrical, mechanical, software, and optical interfaces to telescope approved at PDR level), commissioning of 10 micron spectrograph on MIRAC4 at MMT, Magellan Board approval of continued support for project, TSIP approval of Year 2 funding. NSF MRI no cost extension approved, contracts for the PWFS, E2V CCDs and Scimeasure controllers, and the remaining ASM electronics in the signature stage, design for all the big aluminum structures are finalized, the design for the f/16.16 SH guide probe is 90% finished, and the design for the calibration optics is finished.

Pre-ship review planned for May 2011; shipping to Magellan in July 2011; first light August 2011; commissioning in Jan 2012.

ASM has to be continuously powered to avoid dust contamination. Observing is envisioned as campaign mode since it takes ~1 day to replace the secondary mirror.

Szentgyorgyi: Can you add a NIR camera to the Nasmyth assembly?

Close: There's not enough space to replace the visible AO, but MIRAC can be replaced with a NIR imager with a 30" FOV; the ASM can give a 5' FOV.

Mateo: What is the expected competition in 2011?

Close: GPI @ Gemini and SPHERE @ VLT are expected to provide >90% Atrehl in the NIR, but they do not provide optical AO. Keck is considering optical AO in the long-range plan. Palomar will likely have a system online before 2011.

M2FS (Mario Mateo)

MRI instrument development proposal submitted to the NSF. Total projected cost is \$2.02M (70% NSF, 30% cost sharing).

M2FS is optimized for fibers rather than piggy-backing on MIKE capabilities. It will be simpler to operate than the current MMFS. The key science goal is synergy with SkyMapper for dwarfs galaxies, star formation, etc.

The design will have an E2V 4kx4k CCD, optimized for 390-900 nm with a range of high resolution modes (~20000, using echelle grating + prism) but also a low-resolution mode (~1000, using a standard grating). The two systems sit on a sliding table and can be switched rapidly. The cross-dispersion will be optimized for fibers rather than the current system, which is optimized for the MIKE 5" slit. At high resolution can observe 48 targets x 3 orders, or 3-4 targets with full order coverage. The pair of spectrographs allows both to be used in high-resolution or a combination of low- and high-resolution. The overall design is similar to PFS, but is about twice as large.

Funding (if approved) will start in Sep 2009. Commissioning is envisioned for Dec 2011 (an aggressive schedule). MRI allows a no-cost extension available until 2013 providing a schedule cushion.

Berger: What is the limit from fiber collisions? Throughput?

Mateo: 14" separation; 20-30%, which is better than MMFS

Schechter: Is Mario going to supply personnel for commissioning since this is a PI instrument? There need to be guidelines in place for support of PI instruments.

Mateo: We will provide an expert observer from the team for every observing run.

PISCO (Tony Stark)

PISCO is on track for completion in Oct 2009. The new dichroic cubes are now complete to spec. All glass blanks have been delivered; RFQ for lens grinding is in progress. Electronics and CCDS are finished and tested. Dewar and instruments mechanics are in progress (some parts are already made). Successful data reduction pipeline testing on LDSS3 data. Due to the passband of the dichroics, the net filter transmission is somewhat different from SDSS griz. There are still issues with instrument sagging.

The SPT is going well with ~50 clusters found so far. Expectation is ~1 cluster per deg².

PFS (Steve Sheckman)

PFS will deliver $R \sim 120,000$ spectra (0.2" slit; 3.7" length). Test spectra look very good. The thermal control system has not been tested yet. Slit rotation was miscalculated resulting in placement of the grating on the wrong side (will have to be moved). Optical alignment is still ongoing. The spectral range is fixed at 3900-6200Å.

Osip: Will there be support for external observers?

Sheckman: Only in collaboration with the instrument team

Phillips: How often to you need PFS on the telescope?

Sheckman: More than once per lunation (likely \sim twice). There are overheads like ion pump cooling which may take \sim 1 day.

Szentgyorgyi: Does the instrument need to be thermally controlled all the time?

Sheckman: Ideally yes, but cannot commit to this answer right now.

Close: Is PFS going to be a heat source if it is cooled all the time?

Sheckman: There are some issues with the heat leakage from hose connectors, but this is being worked on. The instrument should be stored on the dome floor.

FourStar (Eric Persson, presented by Alan Uomoto)

FourStar is a 4k x 4k JHK band imager. Internals are 95% complete and camera/window optics are mounted in cells. The optics are ready to install. 12 of 16 temperature sensors are installed. About half the controller system is installed. All focal plane mechanisms have been installed and tested warm. There is room for 3 additional filters beyond JHK; it is not clear if other filters have been requested by the community (e.g. narrow band filters). Electronics racks are complete; process controller yet to be finished. Data computers will use blu-ray to record engineering data and USB disks to record science data. Control software is 95% done. Data acquisition and pipeline are in the "Dan Kelson is working on it" mode.

To be done: First cooldown in late March 2009; a new postdoc arrives in June 2009; several cold alignment cooldowns (each takes \sim 1 month); pre-ship review in Dec 2009; ship to LCO in 2010A.

Berger: How much data is generated per night? Is it backed up on the mountain?

Osip: \sim 10 Gb per night; backup on the mountain for \sim 1 month.

Berger: Do we need a data backup system on the mountain for the new large format instruments?

A serious issue is that 3 of the 4 detectors miss the read noise specs (30 electrons vs. 20 electrons). Team is currently working with Teledyne to resolve this issue.

Berger: Would the instrument be shipped with the noisy detectors?

Uomoto: Ideally no – we'll know more about this issue soon.

Szentgyorgyi: Should the SAC vote on the detector issue?

Close: This is a specification for the instrument so it has to be met; 20 electrons is not even aggressive.

Mateo: This will impact the pre-ship review.

Close: I suspect that this noise level will kill any narrow-band applications.

F/5 (Andrew Szentgyorgyi)

F/5 secondary end-to-end tests will take place April 5-13, 2009. Megacam ships to LCO after May 24, 2009 and will be commissioned Sep/Oct 2009 (August 2009 no longer viable). Science operations will start in 2010A (no re-commissioning in Dec 2009). Pre-ship review scheduled on April 28, 2009. MMIRS is optically ready; ships to MMT on April 22, 2009 with a 7-night run in May and 9 nights on June. September run in MMT and then ships to Magellan in Dec/Jan 2010 for commissioning. A 2-month run will take place in 2010A.

We are in the process of hiring an ½ FTE electrical engineer; shared with Andres Jordan for HAT South support. Will also contribute to LDSS3 support. Cadence of F/5 campaigns still TBD. Will depend on difficulty of shipping between MMT and Magellan, demand at each observatory, instrument crowding at each observatory. Andy thinks F/5 instruments likely to stay at Magellan for 1 year.

Mateo: Will you be using MMT or Magellan WFS? Is the wave-front sensing continuous?

Szentgyorgyi: Not continuous – do it once at the beginning of the night and then use guiders to maintain focus.

Shectman: The system can potentially correct for coma and astigmatism.

Mateo: Why are you planning for a 2-month run in 2010A? Shouldn't this be decided by demand?

Szentgyorgyi: I expect that demand will be heavy and justify 2 months.

Thompson: This information should be disseminated to the user community ASAP.

Mateo: How do you choose which 2 months? Would not like to lose Feb/March.

Thompson: The best approach may be to wait until proposals are in before scheduling the 2 month block.

Schechter: The consortium should ask for "letters of intent".

Mateo: Is LCO ready for making MMIRS masks?

Phillips/Uomoto: We are working on it. Dave Osip will discuss requirements with Brian McLeod.

FIRE (Rob Simcoe)

FIRE will be capable of doing 0.8-2.5 micron spectroscopy with R=6000 (0.6" slit; 7" length) or R~1000 (30" length limited by pre-slit optics). IR slit viewer with fixed J+H filter; can be used for imaging with a 50" FOV. FIRE will be installed on Baade FP2.

FIRE is targeted for completion in 2009B. The project is moving fast; there is considerable pressure from VLT/X-shooter and key science targets in the spring. The goal is rapid commissioning, following the example of MagE.

All optics are in fabrication (<10 weeks to delivery) or delivered. Major mechanical components are either delivered or in final fabrication. Opto-mechanics are in fabrication (<8 weeks) or delivered. Science detector has QE~75-90% in YJHK. It has 5 electron readout noise for Fowler 16 mode (echelle); ~1 hour before dark current starts dominating (0.008 electrons/sec). Software is fully functional; IDL data reduction package based on MagE, designed to extract ABBA and non-ABBA data. The website is up to date with instrument information.

Coming up: April 1 cooldown tests to certify cryostats. Delivery of all remaining components by June 1. 3-5 months of optical alignment in Fall 2009. IDL pipeline released immediately. Pre-ship in Fall 2009.

Some assembly work will be required at LCO. The cooling hoses will be shipped before the instrument.

Mateo: The assembly of the camera at the vendor is unusual for Magellan instruments. Has it been cost effective?

Simcoe: Yes – we did not have in-house expertise.

Szentgyorgyi: Using experts was the right approach.

Szentgyorgyi: 10 weeks for the camera assembly sounds very optimistic.

Simcoe: That's the schedule from the vendors, and the optics are relatively small so this seems like a reasonable schedule.

The consensus is that Coastal Optical is a reliable vendor and 10 weeks should be okay.

Thompson: Why are you using so many different vendors?

Simcoe: Price, spreading the load; a lot of places are specialized so we had to go with several contractors.

Laird: Are you using the same detectors as FourStar?

Alan: No. This is a later batch.

Rob: This is the same batch as the one FourStar replacement detector, which is the one that's up to spec.

Laird: What would you recommend for FourStar?

Rob: Replace the 3 noisy detectors with a batch from after summer 2008.

Mario: What is the planned instrument status for 2010A? Need to communicate this to potential observers.

Paul: In commissioning. Rob may be a "service observer".

Rob: Unlikely that I will be able to sign off completely in 2010A, but the instrument should be functional.

Paul/Rob: Should be used as PI instrument in 2010A.

Edo: Will FIRE be straightforward to use for target-of-opportunity?

Rob: The instrument is somewhat more complicated to use than MagE and may take longer to set up, but it will be kept cold and ready to go.

MagE Commissioning (Ian Thompson)

Mountain support level is ~2 hours per MagE run (checking noise, etc). Manual needs to be completed, particularly with information about flatfield requirements.

The corrector is uncoated and has a crack. A replacement is in hand and will be installed in Fall 2009. Preference not to handle CaF optics in cold weather (Szentgyorgyi: this is a myth; CaF is robust and can be handled in bad weather; not as fragile as advertised). New coating will add ~2% in throughput.

Szentgyorgyi: Is MagE essentially used in commissioned mode?

Thompson: Yes.

Szentgyorgyi: What's the probability that the Council will accept MagE as a commissioned instrument?

Schechter: 3/9.

Instrument Arrival Schedule (Alan Uomoto)

See schedule below (Megacam delayed to Oct 2009). This is overall a somewhat optimistic schedule.

Szentgyorgyi: Is FIRE being shipped by airplane?

Uomoto: Yes.

Mateo: Is the need to travel to pre-ship reviews too stressful on the mountain staff? According to Magellan regulations they have to be present. This is too much overhead.

Schechter: There should be an objective person in each pre-ship review. An outsider.

Phillips: LCO staff involved include Osip, Perez. I cannot attend 4 pre-ship reviews in a few months.

Szentgyorgyi: Why not do this by telecon?

Schechter: Some pre-ship reviews are easier (e.g. MegaCam), but others would need to be in-person.

Szentgyorgyi: Should we have "Pre-Ship-Lite" review process for PI instruments?

Uomoto/Phillips: No! there should be a uniform process across the board.



Schechter: Should pre-ship review include a demonstration of data-taking?

Szentgyorgyi: No.

Thompson: We've never done this before.

Thompson: We need to flesh out what the pre-ship review actually consists of. For example, for FourStar data acquisition is an issue so perhaps it should be reviewed. Complex instruments should require a more thorough review.

Mateo: We need to create a well-defined checklist.

Phillips: We need to see the functionality of the instruments. Instrument should be set up, demonstrated to work, take an exposure, move the filters, gratings, etc.

Szentgyorgyi: We need to trust the instrument teams to be honest – no need for people to travel to pre-ship review just to see an exposure being taken.

Schechter: At least one person should participate in a site visit.

Mario: Does the observatory have a veto power if instrument commissioning becomes too time consuming?

Phillips: We cannot commission more than 2 instruments in a semester. 2010A also has mirror aluminizing scheduled.

Mateo: Should SAC make recommendations about instrument "collisions"?

Schechter: Yes if it is a science issue. Otherwise LCO staff should decide.

Thompson: If FIRE ships on time it will collide with MagIC.

Schechter: MagIC is a facility instrument and therefore takes preference over FIRE when it is in commissioning.

Berger: MagIC will be shifting to PI mode and E2V is still not commissioned so it is unclear that it should have preference over FIRE.

Berger: The problem is that PI status is not well-defined. What is the designation as an instrument migrates from facility to PI (e.g. LDSS3, MagIC).

Schechter: Proposing that MagIC will become a PI instrument when FIRE becomes a facility instrument.

Szentgyorgyi: What is the Carnegie's long-term interest in LDSS3?

Phillips/Thompson We would like to finish on-going programs. It will be easiest if LDSS3 was removed in Dec 2009.

Schechter: This issue was discussed at the Council and Wendy stated that LDSS3 will be supported as long as it does not interfere with new instruments.