MINUTES OF THE UCOAC MEETING
UC Los Angeles, 25 October 2011

Attending: Mike Bolte (UCO Director; UCSC), Alex Filippenko (UCOAC Chair; UCB), Gabriela Canalizo (UCR), Gary Chanan (UCI), Lori Lubin (UCD), Geoff Marcy (UCB, via telephone), Claire Max (UCSC, via polycom), Ian McLean (UCLA), Jerry Nelson (UCSC), Xavier Prochaska (UCSC), Mike Rich (UCLA), Tommaso Treu (UCSB), David Tytler (UCSD). Others (not UCOAC members) attending: Maureen McLean (UCSC, via polycom), Paula Towle (UCSC, via polycom), John Wareham (Lick Observatory, via polycom), various other people for parts of the meeting (e.g., Ned Wright, UCLA; Andrea Ghez, UCLA).

Introduction: Alex Filippenko

Alex thanked the UCLA staff for making the meeting arrangements and everyone for attending. He had hoped that the report of the Visiting Committee evaluating UCO for the UC Office of the President (UCOP) would be available before the meeting, but unfortunately it was not. Still, it seemed unwise to cancel the UCOAC meeting because there are a number of issues to consider. UCOAC members should provide updates to their campus colleagues, discuss issues with them, and see if there are any new matters to bring to the attention of Alex and Mike.

UC Santa Cruz Campus Report: Mike Bolte

Gemini Planet Imager (GPI): GPI is the $20M high-contrast extreme AO imager commissioned for the Gemini-S telescope. The PI is Bruce Macintosh and the Project Scientist is James Graham. Assembly and integration in the "Highbay" at UCSC is going well. The last major component is a spectrometer from the UCLA IR lab.

Shane Adaptive Optics (AO): Upgrades to the Shane 3-m AO system, funded with a $2M NSF MRI grant, were slowed down by the unexpected death (in Feb. 2011) of lead engineer Chris Lockwood, but are now back on track. There was an internal review in September. The fiber laser will arrive soon at UCSC; the team is looking for less expensive options for setting up the laser and beam transport. The IRCAL upgrade is moving along well with software expertise coming from the UCLA IR Lab. The project is about half done, and they are half way through the budget.

New UCO Website: The new UCO website (http://www.ucolick.org) went live in August 2011; it has a better look and improved organization. Efforts are continuing to further improve the content and uniformity at lower levels. Information from the labs is being archived.

UCO Associate Directors: Connie Rockosi is the new UCO Associate Director for Instrumentation. Xavier Prochaska has taken over from Burt Jones (who retired) as the Associate Director for Lick Observatory.

UC Astronomy & Astrophysics Strategies for the Next Decade: The UC Astronomy Task Force (ATF), chaired by Geoff Marcy, completed its work in June 2011. The committee took its charge very seriously and did lots of work in a short amount of time. They conducted a systemwide survey, held two town hall meetings, and had a number of telecons. 90% of respondents ranked the TMT and Keck among the top 5 priorities; the corresponding value for optical/infrared instrumentation/infrastructure was 71%, and 41% for Lick Observatory/Mt. Hamilton. Furthermore, TMT and Keck were identified as the very top priorities (with roughly equal weight). The UC-ATF's Prioritized Investment Recommendations are as follows.

(1) ***Ensure the long-term success of UC leadership within the TMT project.*** UC should continue to play a leadership role in the development of TMT's telescope design and instrument suite by investing in the technical expertise and UC laboratories. UC should commit to shifting $6.5 M/yr in 2018 from Keck operations to TMT operations when Caltech is contractually obliged to pick up that portion of Keck operations. This represents UC's contribution to TMT operations for a 15—18% share, leaving UC's share in Keck unchanged.
(2) ***Keep the Keck Observatory at the cutting edge of 10-m class telescopes and maintain UC's current share of the telescopes.*** UC should continue the contractually obliged funding of Keck operations. It should design and construct new instruments and new adaptive optics systems for the Keck Observatory. This requires UC to keep its instrumentation labs strong (at UCSC and UCLA) and to pursue, with its Keck partners, sources of additional funding.
(3) ***Strengthen support for development and construction of instrumentation and adaptive optics.*** UC facilities, instruments, and personnel are vital to UC's leadership in both Keck and TMT and to the success of these observatories. UC should focus system-wide funding on labs capable of building next-generation AO and instrumentation. It should also identify ways to mitigate risk for TMT and advance science at Keck.
(4) ***Continue funding Lick Observatory at current levels, while exploring other funding models.***

A separate recommendation is the creation of a **UC Astronomy and Astrophysics Council.** This new body will improve the UC A&A community's ability to examine, optimize, and advocate for the systemwide investments that UC makes in this field.

External Review Committee: The Visiting Committee, consisting of reviewers external to UC, completed its work some time ago, giving their report to the UCOP; however, some clarifications were requested, and it might be another week to 10 days before we see the final version. The UCOAC should discuss the report via email and telecon after it appears.

Super-LOTIS: Since 2008, UC astronomers have been making use of Super-LOTIS, the 0.6-m Livermore Optical Transient Imaging System (http://slotis.kpno.noao.edu/LOTIS), for both science and classroom projects. The price will increase from $10k/year to $13k/year for one half the total available telescope time. We will need to decide whether to continue participating. After considerable discussion, it was recommended that we continue participating for another year, and then reevaluate. This may help mitigate actions at Lick Observatory.

Astrograph Donation: Alan Hale of The Earthrise Institute may have identified the means to transport the Lick Astrograph to New Mexico and is asking about a long-term loan of the telescope. It was built in 1941, and consists of two 20-inch refractors on a common mount, with a 6 x 6 degree field of view using 17-inch photographic plates (typically with blue and yellow filters). It was used to conduct the Shane-Wirtanen galaxy counts and a proper motion survey, but no UC astronomers use it any more. UCOAC members were in favor of the long-term loan, provided there are no hidden costs to UCO.

UC-Caltech Joint Meeting: Shri Kulkarni (Director of the Caltech Optical Observatories) has suggested that we hold another UC-Caltech joint meeting of astronomy and astrophysics advisory groups. The goals would be to consider strategies for possible joint use of Palomar and Lick, as well as alignment of Keck and TMT interests. We should look into this further after the UCOP releases the UCO review.

Lick Observatory Report: Mike Bolte

APF (Automatic Planet Finder) Update: On April 12, the spectrometer was bolted to the telescope, and alignment was completed on May 11. With no optimization or temperature stabilization, the radial velocity precision was 8 m/s, which is reasonably good but must be significantly improved; corrections are being made to the spectrometer. Continuing problems with telescope and dome throughout the summer have hampered progress. The system is on the sky again this week with a number of fixes in place by EOS/EOST. We need to get some agreements about operations in place, and some operations funding identified.

Kast Spectrograph Red-Side CCD: The Kast red-side CCD started misbehaving over the summer and was almost unusable during the last Kast run. After a lot of sleuthing around, a temporary fix has been found. But better long-term solutions are under investigation. A promising possibility is a Hamamatsu 2k × 2k device, 200 μm thick; below 950 nm, it has less fringing than the existing Reticon CCD.

Summer Visitors Program: We have been upgrading the summer programs: ticketing and advertisement, the VIP experience, Music of the Spheres, and lectures. Feedback is being solicited. Most of the programs are sold out very quickly.

Staff and Volunteer Events: There is an annual staff appreciation dinner, a State of the Observatory lecture and lunch, and a volunteer appreciation event. These are very well received.

2011 Graduate Student Workshop: The 4th annual UC grad student workshop was held Sep. 29 to Oct. 2. There were 15 full attendees and a few part-time. This program is run by the Support Astronomers and they do a fabulous job; excellent feedback was received.

OSETI and SETI: Optical SETI (OSETI) is ramping up again with the 1-m Nickel telescope. Interested donors are being sought. People at SETI have expressed interest in using the facilities at Lick Observatory. A possible partnership is being considered, and a visit to SETI occurred in July, but it isn't clear that UCO would benefit enough from this.

Lick Observatory Visit by UCOP: In August, we hosted a Lick Observatory (Mt. Hamilton) visit by Steve Beckwith (UCOP) and Dan Simmons (head of the Systemwide Academic Senate). They seemed quite impressed with the facilities.

Mt. Hamilton Bandwidth Upgrade: In mid-November, a Mt. Hamilton microwave link (5 GHz system) will be established to the UCSC Extension building (UNEX), at 35 Mbits/sec (existing T1 links are only 5.5 Mbits/sec). The system has been tested and everything works well. It will be put into regular use after new routers are installed, and an antenna mount for the 3-m dome is approved and the installation completed. In early 2012, an 11 GHz system (100 Mbits/sec) will become operational; the FCC license has been issued. The enhanced bandwidth will allow expanded remote use and enables live broadcasts for education and public outreach (EPO) programs. The project is being done with funding from Blue Oak Ranch ARI NSF, UCSC ITS, and UCO.

Friends of Lick Observatory: Bob and Michelle Kibrick have done much of the work to get a "Friends of Lick Observatory" program underway. The goals would be to help raise money, build a political base, and do a better job of public outreach. But there are structures and rules; we need to have a Board. No real staff, although the UCO business office will cover financial aspects. We are looking for potential names, and a proposal needs to be written soon. This is a good opportunity to engage other campuses.

Shiloh Unruh: Long-time Lick Observatory volunteer Shiloh Unruh succumbed to cancer on September 1, 2011. He left a significant fraction of his estate to Lick Observatory. His primary wish is to have the 12-inch Alvan Clarke refractor restored to the dome currently occupied by the Nickel telescope. It remains to be seen whether this is financially feasible, even with his donation; the UCO staff are looking at a number of options.

Keck Observatory Report: Mike Bolte

Keck Cosmic Web Imager (KCWI): KCWI (PI: Chris Martin, Caltech) is an integral field spectrograph for Keck II at the Nasmyth mount, covering 0.35 to 1.0 μm and having considerable flexibility (field of view from 8" to 30" × 20"; selectable gratings R ≈ 1,000

to 20,000). It is optimized for very low surface brightness targets and faint emission features, with high sensitivity (throughput > 25%) and precise sky subtraction. The project has received $2.4M from TSIP to date (via two successful proposals). The Preliminary Design Review (PDR) was on June 15, 2011, and the total cost was estimated to be $8.5M. The Keck Science Steering Committee (SSC) had a good discussion and recommended going forward with a request for a blue-side only, upgradable version. A 2012 TSIP proposal for $2.8M will come up about $1M short for the blue-side only option.

LRIS-R Upgrade Upgrade: The two new devices and cryostat are working fine, but some optimization is continuing. However, there are no spares. We will possibly consider an LBNL 4k × 4k device, or the Dark Energy Survey 2k × 4k spare devices.

Keck I Deployable Tertiary: One clever idea for enabling Target of Opportunity (ToO) or cadence observing is to replace the Keck I tertiary with a deployable system. Seed money was requested and granted by the Keck Observatory for working out more detailed feasibility and cost estimates; these are nearly completed. A 2012 UCSC NSF MRI slot will probably be used for this project.

Keck White Papers 2011: There was a call for "white papers" for new Keck instruments or upgrades. Eight white papers were submitted. The Keck SSC selected two proposals for improved red and blue throughput for DEIMOS (Connie Rockosi) and two concepts for more stable stellar radial velocity spectrometers (John Johnson, Geoff Marcy, Rebecca Bernstein).

NSF Portfolio Review: Of probable relevance to Keck (and the TMT), the NSF response to projected budgets and Astro2010 decadal report aspirations was to set up a "portfolio review": http://www.nsf.gov/mps/ast/ast_portfolio_review.jsp#link3. Daniel Eisenstein (Harvard) and Joseph Miller (UCSC) are the Chair and Vice Chair (respectively) of the Porfolio Review Committee. Committee activities began in late September 2011, and a report will be completed by the end of June 2012. The time frame is planned so the Review recommendations may be considered in the budget process for FY2014.

The committee was asked to construct its recommendations in a two-stage process: (1) determine the critical capabilities needed to make progress on the science program articulated in Chapter 2 of Astro2010; and (2) determine what combination of new facilities and programs plus existing (but evolved) facilities and programs will best deliver those capabilities within strict budgetary constraints.

Recommendations will be made in the context of the full domestic and international astronomical landscape, taking into account the effects on current and potential partnerships and on the status of the profession. The review will *not* reopen the debate on the content or the relative prioritization of the Astro2010 recommendations.

The Future of the Telescope System Instrumentation Program (TSIP): The President's FY12 budget had zero dollars for TSIP. Bolte, Keck Director Taft Armandroff, and

Caltech Optical Observatories Director Shri Kulkarni have been in conversation with the NSF about a possible successor program. A recent update is that this will be folded into the NSF AST portfolio review.

Keck Advancement: In 2011 thus far, a total of $550k has been raised. Additional members are being added to the Advancement Council. KCWI is likely to be the next big push.

UC Eligibility to Apply for Keck Time: The current rules for Keck-time applications has the following Category B: "Up to 20% of the UC share of observing time can be awarded to non-faculty UC scientists holding research appointments with titles such as "research astronomer" or "research physicist" and the like. These must be full-time, long-term appointments. Proposals from individuals in this category will be judged in competition with those coming under Category A above."

Category B is likely too vague. There is a list of official UC titles, but usage is not uniform from one campus to another. Rather than relying on self-reporting, we may need a vetted list submitted by each campus. Maureen McLean will look into rephrasing Category B, perhaps using the terms "ladder research faculty" or "research astronomer series."

Keck LGSAO Capability and AO Future: Keck has been clear leader in adaptive optics (AO) and laser guide star AO (LGSAO) science. The next big step, next generation AO (NGAO), has proven to be difficult to fund. Thus, piecewise improvements are the current path forward: wavefront sensor (Keck Foundation), center launch laser, higher power laser, IR tip-tilt, point-spread function reconstruction, K1 laser, algorithms.

The K1 laser implementation has been questioned and will be discussed by the Keck SSC in November. In particular, there may be a significant imbalance in the time pressure on K1 and K2. However, the motivation for K1 laser implementation is that it will increase the number of LGSAO nights available, and we will have the ability to upgrade AO without taking LGSAO offline.

Where are we headed? To some people, the mantra had been "All AO, all the time," but this will probably not be the case. We have been demand limited at about 45 nights per semester. However, we need to consider the unknown effects on time demand when we have better AO performance, improved OSIRIS sensitivity, and the eventual loss of the Hubble Space Telescope. On the other hand, AO is expensive compared to other instrumentation. NGAO is estimated to cost $50M, and attempts to secure private funding have not yet gone far. An NSF mid-scale proposal combined with private support remains a reasonable path, but this has probably been stretched out to 2013/14 for a possible NSF start. The Gordon and Betty Moore Foundation and the Keck Foundation have each expressed an interest in supporting AO at WMKO. An alliance of these two foundations in this area may provide a key addition to our funding model for major future AO upgrades and innovation at Keck Observatory.

Archiving of Keck Data: Claire Max pointed out that there is a new rule that NSF proposals must include a Data Management Plan, including a description of data archiving. Prochaska will draft a few sentences describing our intentions and progress in this area, and these will be emailed to all faculty so that they may incorporate them into their NSF proposals.

Keck Phase Control System:

Gary Chanan brought up the issue of the Keck Phase Control System (PCS): not enough attention is being paid to it. Somebody at Keck needs to spend roughly 10 hours per month to make sure things are working well. Bolte will bring this up with Keck management.

UCLA IR Lab Update: Ian McLean

Currently there are four main projects, as follows.

(1) MOSFIRE, a 0.97−2.45 micron camera and multi-object spectrograph for the Keck Observatory. PI Ian McLean. The planned July shipping was cancelled when a major problem was discovered with the Cassegrain bearing. The new bearing is due December 12. Delivery has been delayed to early 2012, and commissioning is now planned for Semester 2012A.

(2) GPI, a 1−2.5 micron extreme AO camera and integral field spectrograph for the Gemini South 8-m telescope. The overall PI is Bruce Macintosh (LLNL); James Larkin (UCLA) is the PI for the infrared spectrograph. A new problem was discovered with the closed-cycle coolers: vibration-induced noise in the H2-RG detector. Shipping to UCSC has thus been delayed several months, to late 2011.

(3) IRIS, a 1−2.5 micron AO camera and integral field spectrograph for the TMT. PI James Larkin (UCLA); Co-PI Anna Moore (Caltech). There was a partial start into the PDR phase; mechanism prototypes for risk reduction.

(4) FLITECAM, a 1−5 micron camera and grism spectrometer for NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA). PI Ian McLean. It was delivered to NASA over the summer, and the "first flight" occurred on October 13/14, and the fourth one was on October 24 (last night).

So, in summary, three major projects are coming to an end (MOSFIRE, GPI, FLITECAM). But support is still needed for previous instruments (NIRSPEC, NIRC2, and OSIRIS at Keck; Gemini is still in use at Lick, despite having been completed in 1993). For the future: IRIS work has picked up slightly, but the limited budget is a restriction to significant progress. The UCLA IR Lab has some support from NASA, but funding remains extremely tight. They lack a major project with sufficient funding to

retain technical staff and grow back to their previous strength; previously there were 12 FTE, but now only 8.

TMT Update: Mike Bolte

Hawaii Permit Status: There was a Board of Land and Natural Resources hearing on February 25, 2011, and the TMT permit was granted. However, a "Contested case" was also granted and was held over six long days in September. There will be a ruling in mid-November.

Technical Progress: Technical progress continues. Tinsley met specifications on the Type-82 segment roundel. The hexed segment has been mounted on the segment support assembly. The "spindle time" is good. There is significant simplification of the M2/M3 support: 60-point active support to an 18-point passive system. However, work on the first-light instruments is slow.

TMT Partnerships: Building an international partnership remains a major focus of the TMT Board. It is an intrinsically complicated process with a workshare distribution matrix.

The role of the NSF remains unclear. NSF AST budget projections do not support many of the high-priority initiatives in the Astro2010 report. Nevertheless, in a meeting between NSF AST leadership, the TMT Board, and the GMT Board, it was announced that a process would be undertaken in 2012 to select a federal partner for a Giant Segmented Mirror Telescope.

The open meeting was adjourned at 4:30 pm, and an Executive Session was held.

These minutes were provided by UCOAC Chair Alex Filippenko.