
Keck SSC Report, June, 2016

Judy Cohen and Crystal Martin
June 22, 2016

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- Many thanks to Crystal Martin who is retiring as the UC Keck SSC co-chair after 4 years of service.
 - SSC supports the directors recommendation of Aaron Barth and Jean Brodie as SSC members from UC, with Jean Brodie becoming UC SSC co-chair.

Recommendations to CARA Board and Highlights

The SSC recommends adoption of the Keck Strategic Plan, with minor modifications and rearrangement of the text in the introduction (to be completed within 1 week)

The SSC recommends actions detailed below on the 5 submitted white papers.

The SSC is very pleased with the great results from the implementation of the TCS upgrade on K2, and looks forward to the completion of this project in FY2016.

The SSC is very pleased with the success of the Deimos repair mission, which has significantly improved the reliability of the grating positioning and cut down on time lost to faults.

Keck Scientific Strategic Plan

- Many thanks to Anne Kinney for guiding this effort and writing the document.
- Process involved widespread input from community.
- Strategic planning process was driven by WMKO/COO/UCO Directors.
- Outcome
 1. General agreement about instrument priorities.
 2. SSC is carrying out further tuning of written document's introduction to be finished in 1 week.
 3. Professional writer to produce version for funders.

Keck SSP Priorities – unranked

Instruments	Notional First Light	Supports
Keck Planet Finder (KPF)	2020	Exo-planets, JWST, WFIRST, TMT
Keck All sky Precision AO (KAPA)	2019	Exo-planets, JWST, TMT
Upgrades, Enhanced Capabilities		
NIRSPEC PRV	2018	Exo-planets, Push limits of FOS
Keck Observatory Archive (KOA), DRP	Ongoing	Maximize scientific impact, Efficiency of operations
AO PSF Facility	2018	Maximize scientific impact
Design Studies		
Highly multiplexed, highly sensitive spectroscopy (e.g. doubling of DEIMOS FoV, detector upgrades, grating upgrades, etc.		WFIRST, Euclid, TMT, Push limits of FOS
High Contrast AO (HCAO)		Exo-planets, JWST, Subaru synergy, maximize science impact
Next generation instruments (e.g. Super NIRSPEC, Dream Machine, larger format IFU for AO, wide field UV imager)		Exo-planets, JWST, TMT, AO
GLAO, performance gains, cost of implementation on one or both telescopes, investigate performance of current suite of MOS's with GLAO, etc.		JWST, WFIRST, Euclid, TMT Improve efficiency of ops, maximize scientific impact
Deployable tertiaries (mirror and/or dichroic)		JWST, WFIRST, TDA, Efficiency of operations, maximize scientific impact

WMKO Observatory Report (1)

- Keck continues to ramp up Maunakea outreach: meetings with Governor, community leaders, and contributing to community outreach
 - Contested permit hearings for TMT planned for June through summer
 - PUEO, a local island organization of native Hawaiians, formed to support astronomy on Big Island
 - Decommissioning started on CSO and Hoku Kea telescope, although there have been some community protests AGAINST decommissioning
 - Top 5 FY17 priorities are routine operations, segment repair, completion of KCWI-blue, OSIRIS imager upgrade, and completion of K1 deployable tertiary
- KAPA NSF MSIP proposal was not funded, still waiting to hear on K2 IR wavefront sensor, NIRSPEC PRV upgrade. Now soliciting private funding to complete the Keck planet finder and KAPA

Other News

- Staff Updates
 - Hien Tran --- leaving for STScI
 - Two experienced new support astronomers: Josh Walawender and Percy Gomez
- FY2017 Plan consistent with 5 yr plan
 - 1 yr. PSF reconstruction funding from UCOP
 - Keck Planet Finder (KPF, formerly known as SHREK) approved and funded through preliminary design review
 - Pending: NIRSPEC PRV, Keck II AO, fiber injection. ~2.4 FTE
 - Numerous on-going efforts:, including DRPs, NIRSPEC detector upgrade, infrastructure improvements, photovoltaic system at summit

Instrument Projects

- KCWI-B is mostly on (replanned) schedule; will begin testing ~July 1 and shipping is scheduled for October
- KCWI-Red project is being reviewed prior to commencing; hope to start in September
- Keck I Deployable Tertiary passed DDR
- OSIRIS DRP Hack-a-thon held at UCLA in May; progress made on identifying problems, but not all problems fixed. Updated DRP posted to Github. WMKO will announce DRP status on OSIRIS website

NIRES

- Major problem with H2RG detector is now on path to solution
- Remaining critical work items
 - Get DSP code into final form
 - Measure flexure; will take several weeks
- *Tentative ship date: Sep 2016, after pre-ship review*
- As before, observatory plans for first light and shared risk science to be made once ship date is firm.

KCWI-B

- Organized list of optical, electronic, software issues that are being worked through.
- Problems and Concerns:
 - Loose detector nod-and-shuffle linkage requires further testing
 - Contaminants and particulates on COL and FM1 mirrors traced to large optic purge line.
- Increase in slope of funding, and reach budget allocation at end of Jun 2016.
- Second half of August will be major testing push.
- Pre-ship review on Oct. 10, 2016
- Ship to Keck end of Oct 2016, consistent with the major replanned schedule
- Eager to see results of KSAT testing data reduction pipeline
- Plan to ramp up KCWI-R

Telescope Projects

- Primary mirror segment repair production review passed in March; on schedule and budget for mid-2019 completion
- TCS upgrade completed on K2, in-progress (all hardware deployed) on K1. RMS pointing < 1.5" RMS !!
- LGS AO operations resumed in April on K2. 10x signal return vs old laser, laser completed on-time & budget.
- DEIMOS servicing successful; no time lost since servicing due to grating drive
- Primary mirror communications system upgrade in design and preliminary test
- Median telescope seeing consistently $\sim 0.67''$ in the visible over past 15.5 years

Proposed ToO & Cadence Plan

- UC and CIT have implemented internal ToOs for many years. Cross-institution ToOs introduced for 2016A: one ToO executed so far
- K1DM3 will arrive in 2017B. To fully implement our commitment to NSF, we need to further develop cross-institutional ToO and cadence policies.
- Guiding principles for new pilot program:
 - Single policy for all partners
 - Modest changes to current model
 - Keep it simple
 - Monitor lost time from instrument changes, observer changes, etc

New ToO and Cadence Policies

- SSC proposes to expand UC-CIT ToO policy to all partners.
 - Single WMKO website for triggers
- SSC proposes to implement new scheduling plan which will make scheduling $\frac{1}{2}$ and $\frac{1}{4}$ nights easier
- SSC plans a new snapshot program with maximum total clock time of one hour.

Proposed ToO and Cadence Pilot

- **Keck-wide partnership ToOs**

- Expand existing UC-CIT policy to all partners
- Protect small allocations ($\leq \frac{1}{2}$ night exempt)
- Propose cost of 2× real time; correct imbalances each semester
 - Accounts for interrupts occurring only in good weather

- **Keck-wide cadence scheduling**

- Partial ($\frac{1}{2}$ and $\frac{1}{4}$) night scheduling already accepted
- New snapshot program for short (<1 hour) observations needed for science. Preference for start or end of night
- If these do not fit into schedule, make room by distributing ~10% of full nights into partial nights or by trimming allocations by not more than 1 hour, in consultation with each partner.

Pilot Program Goals and SSC Comments

- Do unique science not possible now
- Learn how to schedule fractional nights better across partners
- Determine community demand for TDA components
 - Establish caps on ToOs and snapshots in advance to reduce impact to schedule and classical programs
- Digest results to best prepare for TDA with the K1 deployable tertiary in 2017B and beyond
- SSC felt that 1 year was not long enough; consensus for a 2-year pilot program with a review after 1 year
- Total number of partnership ToOs + snapshots will be capped at sum of 6/partner each semester

White Papers Selected for Funding

- 5 white paper proposals received. Criteria for funding include references to priorities in new Keck Strategic Science Plan
- OSIRIS DRP to be funded directly by WMKO
- First phase of GLAO study recommended:
 - Focus on potential performance and feasibility
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- MODIUS study recommended:
 - Refine science case and simplify instrument
- K2 Dichroic study to be re-focused on assessing science and feasibility of ESI + NIRES

Future ATI & MRI Programs

- Upcoming instrument proposal submissions:
 - ATI due in November
 - MRI due in January
- SSC encourages Keck community members to consult with SSC co-chairs regarding proposals for these opportunities

Disposition of Decommissioned Instruments

- Interferometer
 - No viable path forward for operations funding
 - Little remaining expertise
 - LBTI more sensitive (and supported by NASA)
- LWS – decommissioned
- K1 Forward Cassegrain Module and K2 Infrared Steering Mirror
 - No existing no planned instrumentation
- SSC supports disposing of unused hardware in support of Keck science (e.g. detector for NIRES slit camera), developing good will in the community, supporting educational goals, send to museum, sale to raise funds for future activities