

Keck SSC Meeting

December 2-3, 2015

Caltech

Co-chairs: Crystal Martin (UCSB) & Judy Cohen (Caltech)

Observatory Report

- Keck remains facility with highest “impact” per telescope
 - Roughly 300 refereed papers/yr (since 2006) using Keck data
 - Papers based on Keck AO continue to rise (currently at ~75 annually)
 - Four of the 5 most productive ground-based telescopes in the world are on Maunakea (Keck, Subaru, UKIRT, CFHT)
- KOA usage increasing as measured by citation count. KOA will receive a NASA Honor Award on Dec 8.
 - SSC suggests Hien Tran be recognized at WMKO
- Telescope on-sky efficiency has remained steady at ~45%.
- Sendai meeting recommended greater interaction between Keck and Subaru through increased time exchanges and annual meeting.
 - Encourage bottom-up collaborations
 - Would be beneficial if exchange time could use the Subaru queue

Develop New Strategic Plan

- Task groups met December 3rd at Caltech
 - Keck & TMT
 - Keck & JWST
 - Keck & WFIRST/Euclid
 - Keck & Time Domain Astronomy
 - Keck & Planet finding and characterization
 - Keck & Subaru
 - Evolution of AO at Keck
- Draft reports due at AAS (January); reviewers have been named
- Many volunteers from user community
 - Have representation from UC, Caltech, NASA, UH, Yale, and Australia.
 - Includes early career scientists
 - Includes support astronomers as executive secretaries
- Integration team will meet in February after SSC meeting
 - Prioritize technical needs for next 5 years
 - Discuss implications for future data pipelines and archiving
- Present results at June SSC and CARA Board meetings

ATI / MRI / MSIP Proposals

- Congratulations on the NSF MRI NIRSPEC upgrade award (\$1.3M)!
- NSF MSIP Pre-proposal for K2 near-IR T-T sensor and multiple LGS AO to advance lensing, GR in GC, exoplanets (PI: P. Wizinowich)
 - SSC enthusiastically supports this important step for advancing AO
- NSF ATI proposal to demonstrate near-IR high order WFS & new detector technology on KII (PI: P. Wizinowich)
 - Collaborating with UH on APD camera, PWFS & Subaru on PWFS
 - L-band survey of M stars for exoplanets is scientifically unique (besides LBT)
 - This appears to be an excellent collaboration on AO tech and science
- NSF MRI proposal for adding precision RV capability to NIRSspec is being prepared (PI: C. Beichman)
 - H-band Laser comb from COTS parts, uses Keck II AO with sky and star fiber feed
 - SSC is enthusiastic about the expected 1 – 3 m/s precision, a first for near-IR and at moderate cost and schedule

Other Activities-1

- Segment Repair
 - Pathfinder repair completed and segment returned to telescope with excellent on sky performance.
 - Repair duration shorter than planned 25 vs 33 days which is grounds for optimism but not yet for planning purposes
 - Readiness review Feb 2016 with production start in Spring 2016
- Old Keck II dye laser decommissioned. Successful on-sky test of new laser on Dec 1 with 10x power return and 1.5" image size
- TCS upgrade showing excellent technical performance (~1" rms blind pointing vs 6" with current TCS).
 - Keck II (Keck I) operational handoff planned for March 2016 (June 2016)
- Unattended night observation (UNO) could potentially result in an *additional* 43 hours/year of science observing
 - main reliability improvement: K2 dome
 - SSC remains highly concerned about losing observing time under UNO (because no one is on the summit to fix things) and a potential catastrophic event (because no one noticed ...)

Other Activities-2

- Purchase of spare secondary mirror blank in progress
 - Possible to store the blank (save on cost), polish mirror (active spare), and/or store in a new mirror cell
 - K1 and K2 secondaries are not currently interchangeable
- TRICK (near-IR tip-tilt sensor) operational and available for shared-risk science. Better than existing tip-tilt sensor
- K2 center-launch laser system in routine use since May
 - AO performance is largely unchanged relative to side-launch system; reason under investigation
- FY16 priorities
 - excellence in operations
 - segment repair
 - KCWI-blue commissioning
 - K2 LGSAO fiber laser commissioning
 - OSIRIS upgrade commissioning
 - TCS upgrade handover
 - NIRES installation
 - K1 deployable tertiary
 - KCWI-red preparation

KCWI Report

- SSC continues to strongly support the science opportunity offered by KCWI blue and red.
- Community demand for KCWI remains high
 - Competition (VLT/MUSE) already producing papers at high rate
 - KCWI has unique blue coverage
 - KCWI-R works further to red than MUSE; synergies with JWST
- Initial (but limited) tests show basic spectrograph is working
 - End-to-end spectra with 1 of 5 gratings and two (of three) slicers
- Project exceeds 2/2015 cost estimate
 - Stand down to perform rigorous cost-to-complete plan to be delivered & reviewed in January
 - Timely completion of KCWI is critical to WMKO scientific competitiveness

NIRES

- Progress
 - Science detector window installed, blocks alphas
 - Power supply noise fixed, except for low level gain fluctuation. Can be calibrated out
 - Origin is Leach boards, since it affects each of the two of eight channel boards in a time and value independent manner
 - Detector system working as expected
 - Pipeline under development (ready for TripleSpec data)
 - Hien Tran working on Keck-dependent parts
- To do
 - Characterize detector
 - Test instrument software
 - Prepare for shipping
- Pre-ship review possibly in early Jan, shipping mid-Jan, installation in Feb
 - Visitor port ready
 - Three engineering nights starting April 2016A
 - Priority is flexure correction and can be done in daytime.
- Scheduling observing nights contingent on outcome of pre-ship review
 - Review should be no later than mid-Feb for 2016B use

SHREK

- SHREK passed a system design review (9/15)
 - High marks from an independent panel
- PI Marcy resigned in (10/15)
 - WMKO working intensively with Co-PI, SSC, Board and foundations to find path forward
- SSC endorsed science value of SHREK.
 - Red channel moved to baseline plan
 - Laser comb recommended as upgrade
- Non-advocate review of science competitiveness and technology choices scheduled 16/17 Feb 2015, NASA Ames.