

# Keck SSC Meeting at Caltech

## November 13-14, 2013

# Observatory Report

- Grant Proposals
  - The SSC commends WMKO for its remarkable success with external grant proposals
    - NSF: 3 for 3! (huge contrast to overall success rate of ~8%)  
(*OSIRIS Spec. Detector Upgrade; Deployable Tertiary: TRICK Supplement*)
    - Moore Foundation: *OSIRIS Imager Upgrade*
  - Awaiting news on
    - *NSF-MSIP NGAO (will hear January 10 decision for full proposal, which would be due March 12, 2014)*
    - *NSF-ATI NIRSPEC Upgrade*
  - The SSC endorses putting in NSF-MRI for KCWI-Red

# Observatory Report

- Segment repairs
  - Technically on track with new PM
  - Plan is to process a Pathfinder segment (start 1/15), conduct an external process review, then initiate production (start 9/15).
  - Scheduled completion is at the end of 2017.
  - The SSC agrees that the schedule is aggressive.
  - Since a large number of engineering nights may be required, it is recommended that during this phase half or partial night allocations be considered by all partners to increase flexibility for engineering.
- Telescope Control System Upgrade (TCSU)
  - Loss of electrical engineers is a significant problem.
  - Contracting UCO engineers is under discussion.

# Observatory Report

- AO Projects
  - Tip Tilt Sensor
    - First light Nov 2013; shared-risk science 2014B
  - K2 Laser Center Launch System
    - First light Feb 2014 (slipped a month); shared-risk science 2014B
- KCWI
  - Project management
    - Positive change
  - Optics fabrication going well; sch. & budget risks remain
  - First light 7/15 (slipped from 2/15 in Feb 2013 report)

# Observatory Report

- FY13 Operations Review
  - Performance metrics – should hear from each instrument specialist on this at February SSC meeting.
  - Automated Aircraft Detection will eliminate need for spotters.
    - Operational at K2; K1 next
  - Planning & implementation of energy savings program
- FY14 Priorities
  - Consistent with 5 year plan
- Mauna Kea Lease
  - UH negotiating new lease through 2078 (standard 65 year)
  - WMKO plans to watch TMT lease process
- New Post-Observing Comment Form
  - SSC recommends that the email reminders (also new) should state that the form has been revised
  - Provides important numerical assessments that are being tracked over time, with instrument, etc.

# KCWI Overview

- **SSC is extremely enthusiastic about the strong science case for KCWI and endorses submission of KCWI/Red proposal to NSF/MRI.**
- Critical path for completion of KCWI/Blue is large optical components and IFU.
- Mechanical and electronics progress OK. Although some aspects are lagging, these are not on critical path.
- Software progress is OK with prototype from Palomar.
- Management progress is OK. New Integrated Master Schedule assisting with resource allocation and decision making.
- While there are no apparent technological risks, the project remains challenging in terms of schedule, resources, programmatic issues.

# KCWI Technical Status

- Local vendor providing large flat optical element better and cheaper than originally planned.
- WINLIGHT is providing IFU and other large elements (collimator, fold mirror—FM1).
  - IFU consists of 72 slices. Complete October 2014.
- Careful attention to ghosting in assessing coating options.
  - Selected best Blue coating. As built performance OK
  - Sacrifice of red performance in blue camera makes development of red camera critical to achieve performance longward of 0.55  $\mu\text{m}$
- Next quarter should yield completion of major optical elements, e.g. of Collimator and FM1, procurement of first KCWI grating, and completion of camera assembly and detector housing.

# KCWI PM Assessment

- Can we deliver a technically capable instrument? YES
- Can we deliver on schedule? YES, but NO margin
- Can we deliver on budget? Cost to complete studies underway.
- Is team operating efficiently? YES and improving



# KCWI Project Management

- Proposed shipping to WMKO in May 2015
- Mitigating cost risks
  - Keep lean team to minimize cost
  - Create integrated schedule to aid decision making
  - Need to address increases in mechanical labor/non-labor costs
  - Ensure on-time critical path delivery large optics/IFU
- No major descopes advisable
  - Optical coatings alternates (\$60k)
  - Filters/gratings (fraction of \$200k total)

# NIRES Overview

- Earliest shipping to WMKO in May 2014
  - Better estimate once H2RG is working in the dewar.
- Slit viewing camera designed for Ks for visibility of reddest objects.
  - 2 dead segments on slit viewer camera are adjacent and will result in loss of  $\frac{1}{2}$  of slit.
  - Off-axis guider should be OK for many applications. Although differential refraction will be important

# SHREK Instrument Concept

- SHREK promises to provide high efficiency (3xHIRES),  $R=100,000$ , stable ( $\sigma_v=0.3$  m/s) radial velocity measurements over the iodine cell range (4850-6450Å); PI Geoff Marcy (UCB); co-PI and Project Scientist Andrew Howard (UH)
- Primary science driver is exoplanet research (super earths).
  - Mass – radius relation for small planets
  - TESS-discovered Earth-size planets
  - Low-mass planets orbiting bright stars
- Strong synergy with NASA goals and missions.
- Essential for Keck to remain competitive with radial velocity precision of VLT/ESPRESSO (under construction) and HARPS (3.6m La Silla)
- Implementation approach
  - To be developed at UCB/Space Sciences Laboratory
  - Fiber scrambler
  - Echelle spectrograph with 8-inch beam
  - Vacuum/environmentally controlled spectrograph mounted in beam combining room fiber fed from K1 or K2

# Data Pipelines

- The quality and
- With new complex instruments the quality and availability of data pipelines is affecting scientific productivity.
- Observatory is facing a challenge whether to invest resources in data reduction vs. generating new proposals and/or refurbishing instruments.
- SSC will hear from instrument scientists at February SSC meeting. They will provide
  - tables specifying instrument pipelines, point person, and support.
  - solution for rectification matrices in OSIRIS DRP.
- SSC plans to survey the user community after the February meeting to gain quantitative insight into impact of data pipelines on scientific productivity.

# WMKO Obligation to Keck 1 Deployable Tertiary Program

- Background
  - Date on sky 2016
  - Impact of flexible scheduling changes no more than +1 FTE at WMKO
  - NSF/MRI Proposal stated promises tabulated on following page
- *SSC recommends that a small committee be formed with representatives from UC, Caltech, and WMKO, and science representations from ToO and cadence interests, to develop a strawman implementation plan.*

# WMKO Obligation to Keck 1 Deployable Tertiary Program

Year	ToO	Cadence
1	UC+Caltech integrate their existing ToO programs and WMKO would enable ToO observations with any of the mounted instruments on K1	Cadence programs would be approved by each institution and scheduled by WMKO (1 program per night, restricted to the first half).
2	ToO expands to all WMKO partners. Designated officials resolve competing proposals and ToO programs executed on a first-to-request basis.	Cadence programs would be scheduled any time of night and may involve multiple institutions.
3	Invite additional institutions into the ToO program (e.g., NSF in a TSIP-like proposal).	

# White Papers

- SSC recommends white paper call with mid March 2014 deadline.
- SSC recognizes
  - Lots of commitments for Keck funds, few sources of new funding
  - Importance of bringing fresh ideas into the system
- FY14 budget includes \$44k
- Call should be up front about NO/extremely limited internal Keck funding available for design or construction of new instruments.