Keck SSC, UC Santa Cruz, June 24-25, 2015

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Observatory Report

- The SSC is delighted that Dr. Anne Kinney has accepted the position of Chief Scientist, starting August 3, 2015
- The SSC thanks Chris Martin (Caltech) for his years of service both as a SSC member and as SSC co-chair.

Status of Projects

- Encouraging progress on KCWI (see separate report).
  - 1 month slip due to late IFU delivery
  - Delivery November 2015; First light December 2015
  - Budget OK within available contingency
  - KCWI-B Lessons Learned review will be held to inform KCWI-R
  - Starting work on KCWI-Red
- Current NIRES issues include excess electronics noise and artifacts from radioactive coating on lenses
  - Preship review expected in October.
- Deployable Tertiary on track. Recommend increasing labor contingency.
- SHREK preparing for system design review at UCB during 2nd or 3rd week in August, 2015.

Status of Projects-2

- New K2 laser on track for first light on Dec 2015. Shared risk Apr 2016
- K2 center launch laser working well in shared-risk.
- K1 TRICK system in final stages of commissioning
- Successful engineering with K2 Vortex Coronagraph
- TCS upgrade. About 3 months behind schedule.
  - On track for K-I hardware completion in FY15
  - Full K2 pointing test in July 2015. handover Dec 2015
  - K1 handover March 2016
  - Preliminary performance 1.2” rms on 37 stars is promising
- Primary Mirror Figure Improvements
  - New algorithm and rewritten s/w work well
  - Good collaboration with TMT/WMKO

Segment Repair

- Dry run on test segment went well. Getting ready for first pathfinder segment.
- Pathfinder review in June is readiness review. Highly experienced external review panel
- Pathfinder segment work will start in July, complete in September. Test on sky in November
- Full production in March 2016
- Schedule and budget OK

FY 16 Budget

- Consistent with 5 Year Plan.
  - Independent of success/failure of pending proposals

KCWI Status

- Major components in final assembly and test: IFU, camera, calibration, handling cart
  - Optical tests (end-to-end) show excellent imaging performance
  - Detector functional tests on-going
  - AR coatings performing well and lenses have been integrated into camera which is now in test
  - Silver coatings pass Balzers/Winlight's environmental tests although not stricter UCSC requirements. WMKO signed off.
  - Camera and IFU are close to critical path and there remain some (low risk) activities still to go, so maintaining schedule is still an important driver for shipping and commissioning
- Pipeline v0.2.10 produced, including MIRA test
- Still to go: final instrument assembly and ambient calibration
- Programmatic status mostly green. Some schedule concerns due to IFU slip which will slip overall schedule to Nov. 2015 delivery to WMKO. First light Dec 2015.

MSIP discussion

- AO team not prepared with detailed plan as request for lead gift for NGAO from a foundation was declined very recently.
- Request AO team proceed to a plan which follows the objectives set out in March by SSC. The proposed work should produce very good LGS Strehl over a large fraction of the sky and should, as much as possible, also lay the groundwork for extreme AO over narrow fields.
- SSC requests a 1 page summary + 1 page budget description to be distributed to SSC by Aug 1.
- A draft of pre-proposal must be ready for internal review Aug 15 given NSF pre-proposal deadline of Sep 16.

White Paper Submissions

- Seven white paper submissions received
- SSC supported:
  - Study deployable tertiary for K2 (work to commence only after K1DM3 passes DDR)
  - Analyze laser comb data for precision radial velocity implementation with NIRSPEC (assuming pending NSF/MRI approved); may be ready for MRI in near future
  - Suggest ATI submission (P.I. Mawet/Caltech) to study high performance avalanche photodiodes in near-IR, key for further AO improvements leading to an exoplanet imaging capability for Keck.

MRI for proposed KRAKENS instrument

- SSC remains very interested in a future Keck imaging spectrometer using the MKIDS technology.
- SSC listed several technical issues that need to be resolved before KRAKENS (PI B. Mazin, UCSB) can be submitted to MRI/NSF.
- Recommend UC (UCO+UCSB) find experienced engineering help for interfacing KRAKENS with Keck.

Sendai Meeting

- Upcoming meeting in Japan with representatives from every Keck partner institution.

- Purpose is strategic planning to explore areas of mutual synergy and collaboration between the Keck and Subaru Observatories.

Other

- Keck Science Meeting
  - UCLA on 2015 Sep 17 and 18; website coming July 1
  - Chair, Ian McLean; SOC to be named soon
  - Talks should highlight grad students and postdocs.
  - SSC co-chairs will produce a rough agenda for the meeting. Discussion topics to include cross-institutional ToOs, cadence observing, pipeline strategy and availability within the community. Talks by director, SSC-co-chairs regarding white papers, and outcome of Sendai meeting, followed by 15 min Q&A. Report on previously (FY2015) funded white papers (Pis: Baranec and Riddle, Holden, and Mazin). for the community.
- Caltech/UC cross-institution TOO will be operational in 2015B with 2 allocated proposals from each TAC institution able to interrupt observers from the other TAC institution.
- Cross institutional cadence observing has to be implemented in 2016A. UC , UH and WMKO have agreed to do so starting 2016A.
- Caltech will implement internally cadence observing in 2016A.
- More institutions, including NASA, intend to join cadence observing in 2016B.

Data reduction pipelines (DRPs)

- WMKO developing wiki pages for each instrument with collected info on existing pipelines, authors, and urls.
- WMKO taking ownership of MOSFIRE and OSIRIS pipelines and interacting with instrument PI's. Each is 500-700 hours of effort for development of "full service".
- SSC Recommendation: stay coordinated with KOA and look for possible cost sharing with KOA.
- SSC needs to be more involved in prioritizing development strategy at WMKO given limited manpower available for this effort. Primary effort must be to support DRPs running on Keck machines, and to remove instrumental signature.
- User survey results that 85% would use WMKO-maintained pipelines but want to operate them on own computers.
- Related issue: WMKO establishing wiki for slit mask software.
- Still collecting information on suite of WMKO + community-developed DRPs (see current chart on next page)

DRP Landscape

Instrument	Data Reduction Package	Author	Ownership	Maintenance	KOA	language	WMKO develop	comments
HIRES	MAKEE	T. Barlow	T.Barlow	T. Barlow	yes	Fortran	none	
HIRES	HIRES Redux	X Prochaska	UCSC	X Prochaska	no	IDL	none	
LRIS	Low-Redux	X Prochaska	UCSC	X Prochaska, et al.	no	IDL	none	
MOSFIRE	MOSFIRE DRP	N. Konidaris, C. Steidel	WMKO	L. Rizzi, et al.	no	Python	yes	KOA overlap
OSIRIS	OSIRIS DRP	J. Larkin, UCLA team	WMKO	J. Lyke, et al.	yes	IDL	yes	Many issues, new Detector
DEIMOS	Deep2 DRP	DEEP2 team	UCSC	M. Cooper		IDL	none	
DEIMOS	DEIMOS IDL tools	P. Capak		P. Capak		IDL	none	
ESI	ESI Redux	X Prochaska	UCSC	X Prochaska, et al.		IDL	none	
ESI	MAKEE	T. Barlow	T. Barlow	T. Barlow		Fortran	none	
NIRC2	NIRC2 IDL tools	H. Tran	WMKO	H. Tran, et al.	yes	IDL	minor	KOA
NIRC2	Various User packages					IDL and Python	none	
NIRSPEC	WMKO Nspec	Keck Team	WMKO	H. Tran, et al.	yes	PYRAF	yes	KOA only
NIRSPEC	REDSPEC	L. Prato	WMKO	J. Lyke, et al.	no	IDL	none	
NIRES	NSX	T. Barlow	WMKO	WMKO (future)	yes	Fortran/C	yes	KOA overlap
KCWI	KDRP	D. Neil	WMKO	WMKO (future)	yes	IDL	yes	KOA overlap

Courtesy of Randy Campbell