

SSC Report

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Operations

Regarding pandemic planning, WMKO has a phased response to minimize exposure to staff, the public, and visiting observers, that is consistent with CDC and local health board recommendations:

- Eliminate public events, restrict travel, enable staff teleworking
- Manage hardware supply chains, staff recruiting efforts, etc.
- Increase flexibility with remote observing, including support of first-time observers

Observatory operations continued with normal efficiency, weather, and faults over past year outside of shutdown

Nine Target of Opportunity (ToO) observations executed in 2019B

Instrumentation Status

- OSIRIS serviced in Jan & Feb to replace Holographic Aperture Mask and filter wheels
- NIRSPEC was serviced in February for minor opto-mechanical improvements
- DEIMOS CCD-5 has died, after being intermittent for several months.
- LRIS red detector has issues; it works only when colder than nominal
- KAPA technical progress is on track. Postdoc hiring. KAPA Science meeting to be held in conjunction with 2020 KSM
- New KAPA laser (K1) is working on-sky!

Infrastructure

Last few primary segments are now being repaired; project will be completed soon

Careful examination of first-repaired segment (4 years ago) indicates no degradation.

New 133 kW photovoltaic solar power system installed on summit; then suffered significant damage in top 1% wind conditions of 140 mph; repairs being negotiated.

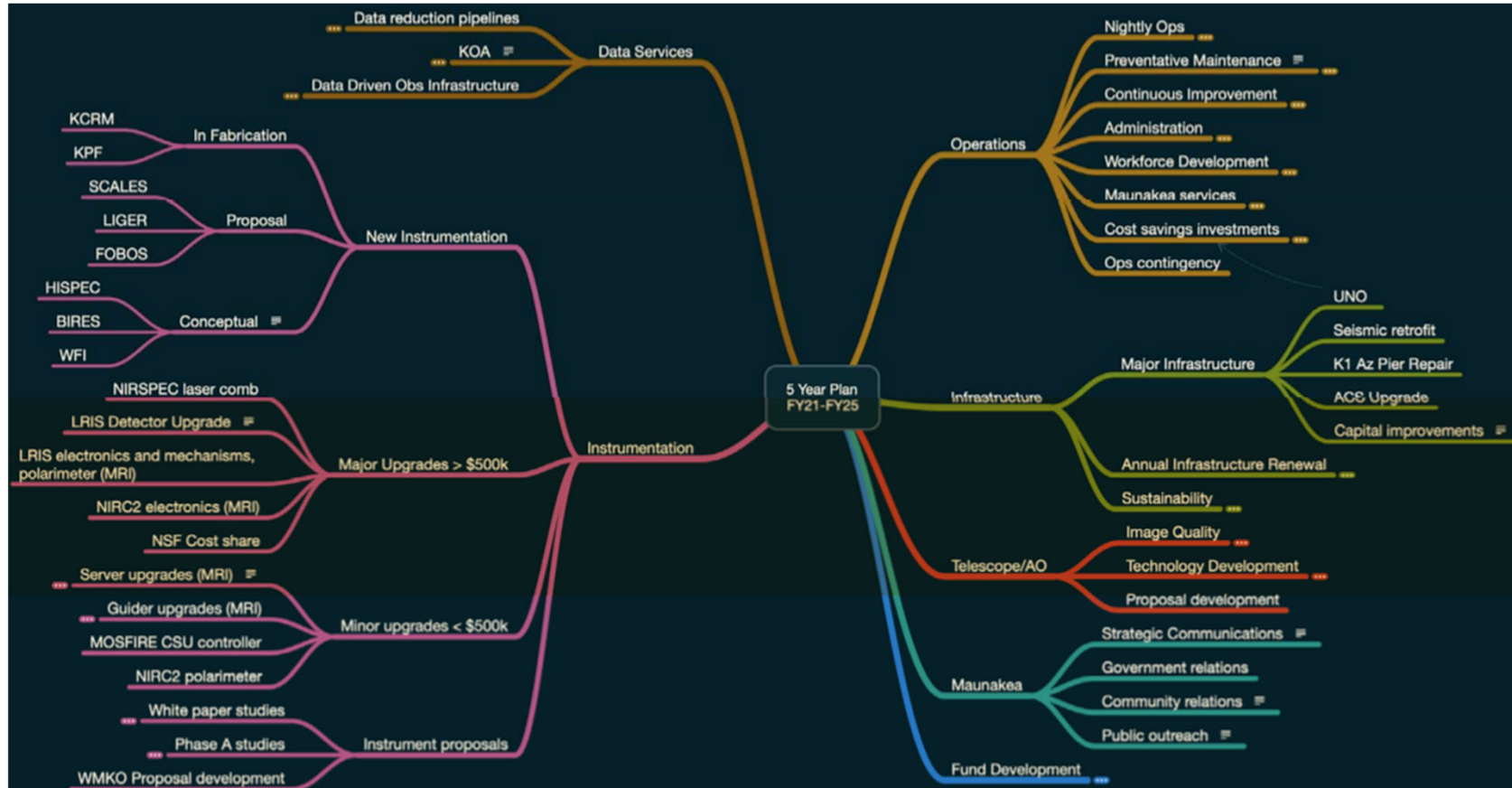
Maunakea Status and Community Engagement

- Maunakea access and land management changes are controlled at state level.
- UH Regents passed a resolution to combine Maunakea stewardship and operations
 - Reorganization and restructuring plan due April 2020
- Community outreach efforts need to be conducted at high level with decision makers, and also at grassroots community level
 - Community outreach may need to be expanded beyond STEM activities (e.g., workforce development more generally) for true relationship building.
- WMKO is regularly communicating and working with other Maunakea observatories on proactive land management actions and community outreach efforts.
- WMKO presence at Honolulu AAS meeting. Astronomy community very interested in Keck data archive (KOA) and also Keck scholars program.

WMKO Five Year Plan: Goals

- Maintain operations service level – load has increased due to TDA / ToOs
- Risk assessment and risk mitigation
- Sustain the facility and the staff
- Position the observatory for the era of new facilities on the ground and in space with a vigorous instrumentation program
- Maintain fiscal sustainability

WMKO Five Year Plan: Components



WMKO Five Year Plan: Budget and Risks

Identified risks in the planning:

- Retired: spare secondary mirror blank in house; would be down only a few weeks to replace if necessary
- Funded: Keck-I azimuth pier; safety issues; MK lease;
- Currently unfunded: worst case scenario of pier costing; seismic upgrades

WMKO Five Year Plan: Instrumentation

- KPF is highest priority and Five Year Plan includes overall funding strategy
- Seeding new instrumentation is second goal, with three new instruments currently under consideration for NSF funding: KPF, FOBOS design, and SCALES
- Planning to propose through Keck MRI slot for major refurbishments of LRIS, NIRC2 electronics, and also AO bench upgrades
- Funding for other obsolescence upgrades and refurbishments, including some AO, instrument, and software, but some not yet known.
- Funding for initiatives coming in through white papers, Phase A designs, strategic planning results, and WMKO proposal involvement and internal preparation.

WMKO Five Year Plan: Data Services Initiative (DSI)

- DSI is a new strategic program that is important to our science productivity and competitiveness AND important to NASA.
 - Rapid ingestion of raw and quick-look data and quick pipeline processing; will make Keck data more robust and reproducible.
 - Will improve WMKO science capabilities in time-domain arena and accelerate production of scientific results overall.
 - Will boost utilization and productivity of the Keck archive.
- WMKO is proposing for overguide NASA funding to implement DSI.
- Most development and maintenance work will be done at WMKO+NExSci with supporting work at partner institutions.
- Could make connections in the outreach arena: “big data” on island.

Five Year Plan: Infrastructure and Operations

- Reducing risk on safety and K1 operations.
- Upgrading ACS nodebox primary mirror communications system.
- Continuing annual infrastructure repair budget.
- Improving K2 shutter performance.
- Planning to implement unattended night operations to save operations costs.
Have had to add security details, shared with other observatories.

MSIP (John O'Meara)

- FOBOS and KPF selected for full proposal submission 41 proposals submitted, and 16 were selected to move forward.
- Strong valuation on nights allocation “Community Keck nights are a good return for the program support”, “US Access to the instrument will be enabled”.

KPF Update (Andrew Howard & Kodi Rider) - Part 1 of 2

- Anticipated first light in Jan/2022. Slipped by 4 months due to funding uncertainty, but proceeding full speed now.
- All major subsystems have made progress in the past year. Instrumentation I&T to start August/2020 at UCB.
- MSIP phase 1 proposal selected with very good scores
- Very positive feedback, with no serious weaknesses to be addressed for Phase-2.
- Many of the components are now under fabrication, with new updates.

KPF Update (Andrew Howard & Kodi Rider) - Part 2 of 2

- The Fiber system Manufacturing Readiness Review (MRR) complete in Oct/2019. Most sub-systems, with minor re-routing of the fiber to be addressed.
- Zerodur MRR completed in Oct/2019. Review agreed on moving forward, with further investigation of optical stability glitches. KPF team has been performing long-term stability tests for the last 4 months, with performance results within spec.
- All slicing/grinding of Zerodur parts complete without issues at Corning. KPT team will pursue bench milling at Corning (to start in April/2020).
- Both red and green VPH gratings were completed, with efficiencies above spec.
- Cameras and reformatter fully funded and to be delivered in mid-late 2020. Bi-weekly management meetings with manufacturer (Winlight) will continue until delivery.
- DRP (Data Reduction Pipeline): working with Keck DRP team to establish framework. first versions of individual modules developed & tested on existing data.
- Schedule: critical path items are cryostat units and collimator shaping/polishing.

KCRM update (Rob Bertz) - Part 1 of 2

- Currently starting DDR, and many procurements started. Programmatic DDR to be completed by end of March/2020.
- Instrument to be delivered in mid-2021, and commissioning (6-month duration) to be finished August 2022.
- Project managers now in place at Caltech, UCSC and Keck.
- Ten weeks of schedule slack left at this point (subsystem integration, Caltech AIT, & summit AIT).

KCRM update (Rob Bertz) - Part 2 of 2

Most modules have passed Manufacturing Readiness Review (MRR) and are now in procurement. Several have transitioned to Full Scale Design (FSD).

- Fold-mirror optics MRR complete, starting FSD, designs at WMKO and fabrication planned at CIT.
- Dichroic assembly MRR complete, starting FSD.
- Guider contracted with OMP. WMKO developing new guide camera, filter wheel and cabling.
- Detector subsystem MRR complete, some elements starting FSD, no major issues expected (detectors in hand). Detector subsystem remains on the project's critical path.
- Red exchanger: finishing assembly drawings and starting FSD. 7 gratings purchased.
- Articulation stage: finishing assembly drawings and starting FSD. Long lead items out for RFQ.
- Camera module contracted with Winlight, contract starting FSD. Subsystem 2nd on critical path.

Team Keck TAC (John O'Meara)

- Will move for Keck TAC to have the reviewer pool be SSC members (or people recommended by the SSC), with Chief Scientist acting as the equivalent of the Selecting Official to make final allocation decisions.
- <10 proposals per semester, 1 page each. Allocating 3-4 nights per semester.
- Vary in scope from individual observers to groups

WMKO MRI (John O'Meara)

- Intends to propose 3 small MRI (\$0.5-1.5M) annually, with primary goal for instrument refurbishment/upgrades.
- 3 slots available per year:
 - WMKO instrument-focuses
 - WMKO AO-focused
 - WMKO+SSC collaborative
- Partner institutions may be sub-awardees (rules are 20% max).
- Request that SSC work with WMKO to identify candidate proposals.

Nights Policy

- In Nov 2019 the CARA Board approved the use of 28 nights annually in support of instrument funding proposals.
- The most recent round of MSIP (KPF, FOBOS, Liger) and MRI (SCALES) proposals included nights for the broader community.
- Discussion on how the SSC should decide how many nights to allocate to each proposal going forward
 - Require instrument teams to suggest night usage. PIs should describe how the nights could be used (e.g., key science projects, nights for general community use, etc.)
 - Provide SSC cap flexibility in allocating nights. The cap can be exceeded if the SSC decides that the proposal is strategically important. This will allow the SSC to make recommendations based on scientific merit, without regard to a cap. The cap should not exceed 28 nights per annum over a 5-year period.
 - Allow SSC to re-evaluate allocations at strategic proposal decision points. For example, reconsider night allocation after Step 1 MSIPs and MSRIs are approved or rejected.

Nights Policy

- Teams should consult with the Instruments Project Manager (M. Kassis) to present the most informed proposal possible to the SSC.
 - Teams should understand that the SSC proposals are one-shot, just like a telescope time proposal.
- There is a distinction between MRI and MSIP.
 - MSIP: It is expected that the proposers offer something to the community.
 - MRI: There is little precedent (other than SCALES) for offering nights. \$4M MRIs are approved extremely rarely. Therefore, nights may be required to get the proposal approved.
- There is a distinction between key science projects and community time.
 - Key science projects: To be assigned after the instrument is available. The projects are riskier because they are planned ~5 years in advance.
 - Community time: These are “instant gratification” for NSF.
 - Community time may not always be the best option. As an example, SCALES will observe only a few targets. A key science project using the eventual instrument, rather than general community time, will direct the focus to avoid target duplication and clashes among groups. Teams may wish to offer other incentives, e.g., shortened proprietary period.

Nights Policy: Summary of Discussion

SSC would like to see the following changes to the existing policy:

Use 28 night annual cap as a target instead of a hard upper limit

Over a 5 year period, average allocation should not significantly exceed cap

For two stage proposals (MSIP, MsRIs), allow an opportunity to allocate more nights to a step 2 proposal, subject to the above

2020 Project White Paper & Phase A Call

- 2020 project White Paper/Phase A call will be released after May 22 SSC meeting
- Proposals due before early July SSC meeting
- Expect normal funding available: \$150K for white paper concepts and \$250K for Phase A studies
- Will solicit a broad range of concepts and possibly also encourage proposals targeted to specific instrumentation needs