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The upcoming 10 years at CFHT

Community Consultation Fall 2023



Your hosts for today

- **Jean-Gabriel Cuby**, Executive Director
- **Andy Sheinis**, Director of the Maunakea Spectroscopic Explorer (MSE) Program
- **Mary-Beth Laychak**, Director of Communications and Community Engagement
- **Nadine Manset**, Director of Science Operations

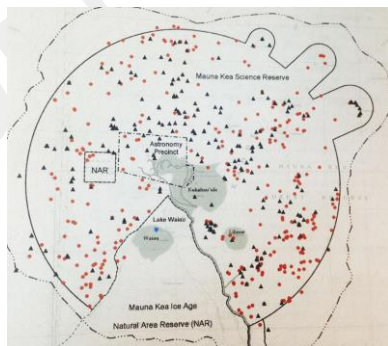


Acknowledgement

- CFHT operates on the land of the Kānaka Maoli people, on the summit of Maunakea.
- We stand in solidarity with the Native Hawaiian people in their rights for shared governance of Maunakea and to preserve this sacred space.
- There are hundreds of historic sites, archaeological remains, shrines and burials on its slopes and summit.
- We recognize the divide that astronomy has created in the local population and we are committed to working with the local communities to try to heal it.



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Community Consultation Process

- May 2023: The SAC and Board are in alignment on a “plan to engage in community consultation regarding the near-term future of CFHT. We recommend a focused survey with a background document and webinar to provide information so users can understand the options.” (SAC report)
- Goals: get feedback from CFHT’s user community regarding a proposed plan for the next 10 years
- Presentations and discussions over Zoom 8/30 and 9/5
- Survey from mid-September to mid-October
- Report for the SAC and Board in December 2023

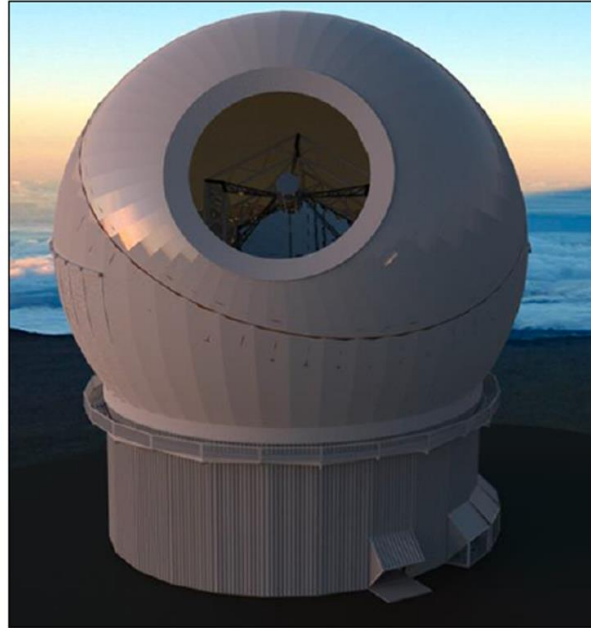


CFHT's past in one slide



- CFHT's First Light was in August 1979
- Classical operations with a wide variety of instruments for the first 20+ years
- Wide-field imaging plan put in place in December 1995: MegaCam (2003) and WIRCam (2005)
- Queued Service Observing introduced in 2001
- New instruments ESPaDOnS (2008), SITELLE (2015) and SPIRou (2019)
- Current Memorandum of Understanding with Associate Partners ASIAA Taiwan, NAOC China; past MOU with LNA Brazil and KAO South Korea
- In 2014, CFHT launched the Project Office for the Maunakea Spectroscopic Explorer (MSE), which is a plan for CFHT past 2033





CFHT's current lease ends in 2033

- We anticipate that lease negotiations with the newly created Maunakea Stewardship and Oversight Authority (MKSOA) will soon start. MKSOA will oversee all human activities on Maunakea, including new leases.
- The management responsibility will transition from the University of Hawai'i to the Authority by mid-2028.
- There is a moratorium on new leases until the transition is complete, at which time new leases may be possible.
- Obtaining a new lease is not guaranteed. The current societal and political landscape requires a shift in our approach to doing science on Maunakea.

We are entering a new era of Maunakea management and governance.



CFHT's proposed plan for the next decade

Context

- Reduce operating costs to match partner funding
- Best use of the funds provided by our agencies and partners to balance CFHT's scientific productivity
- Keep MSE as the goal for CFHT's future

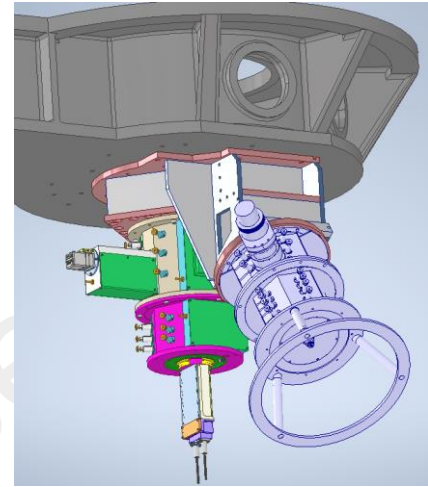
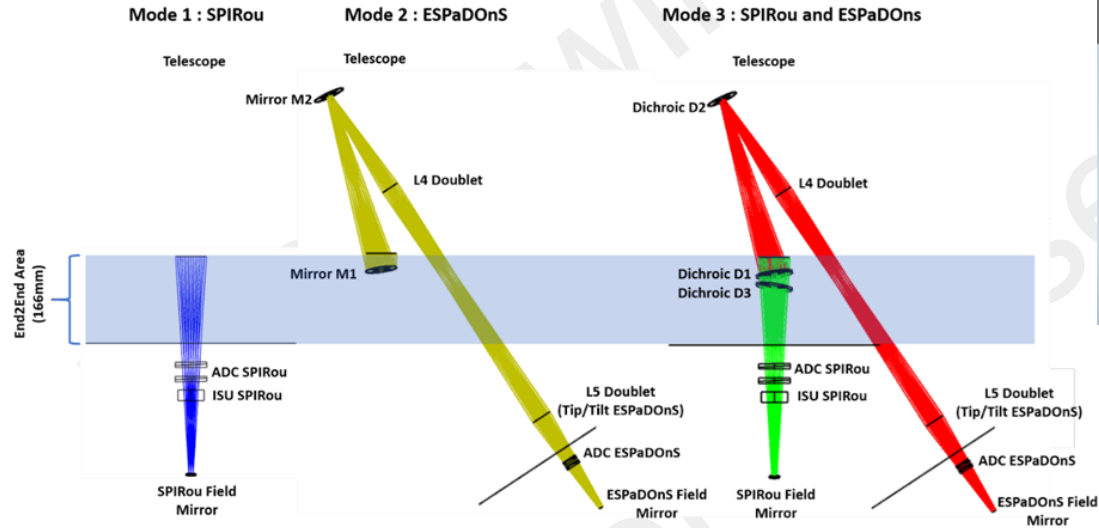


Proposed Plan for the upcoming 10 years

- Streamline the operational workflow
 - Implement VISION, a co-mount of ESPaDOnS and SPIRou, by 2025
 - Decommission WIRCam and SITELLE at the end of 2026
 - Increase the fraction of Large Programs
- A path to MSE:
 - Design, develop, and operate an MSE Pathfinder instrument on CFHT, contingent on budget
 - Advance the MSE design



VISION is an optomechanical interface that will allow installing SPIRou and ESPaDOnS at the Cassegrain focus of the telescope at the same time.



Mode 1 (SPIRou only): the f8 beam from the telescope enters SPIRou without any additional optics.

Mode 2 (ESPaDOnS only), a pair of mirrors and additional doublets direct the f8 beam to ESPaDOnS.

Mode 3 (both instruments), dichroics split the light from the f8 beam into separate wavelength domains and feed both instruments.

Illustration credit: CFHT/IRAP.



VISION requirements

- The polarimetric capabilities of both instruments are preserved.
- The throughput of both instruments is not degraded by more than ~10% throughout the spectral domain (except in the cutoff region of the dichroic plates).
- Capability to switch between modes during the night.
- Implementation end of 2024 or early 2025.



Decommissioning of WIRCam and SITELLE by the end of 2026

- “SAC recommends decommissioning instruments in the near future to focus on one dark time instrument (MegaCam) and one bright time instrument package (VISION co-mount of ESPaDOnS and SPIRou plus a wide-format IFU) in the coming ~5 years. This instrument suite represents a scientifically compelling combination well suited to future LPs and rapid response to targets of opportunity.”
- New call for Large Programs 2025-2026 can make use of WIRCam and SITELLE
- Proposal for new narrow-band filter for SITELLE

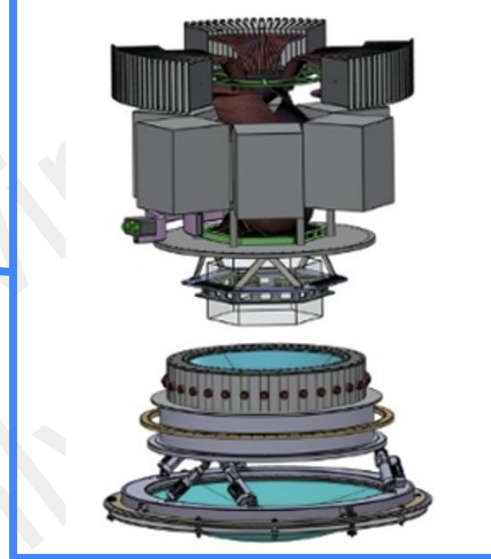
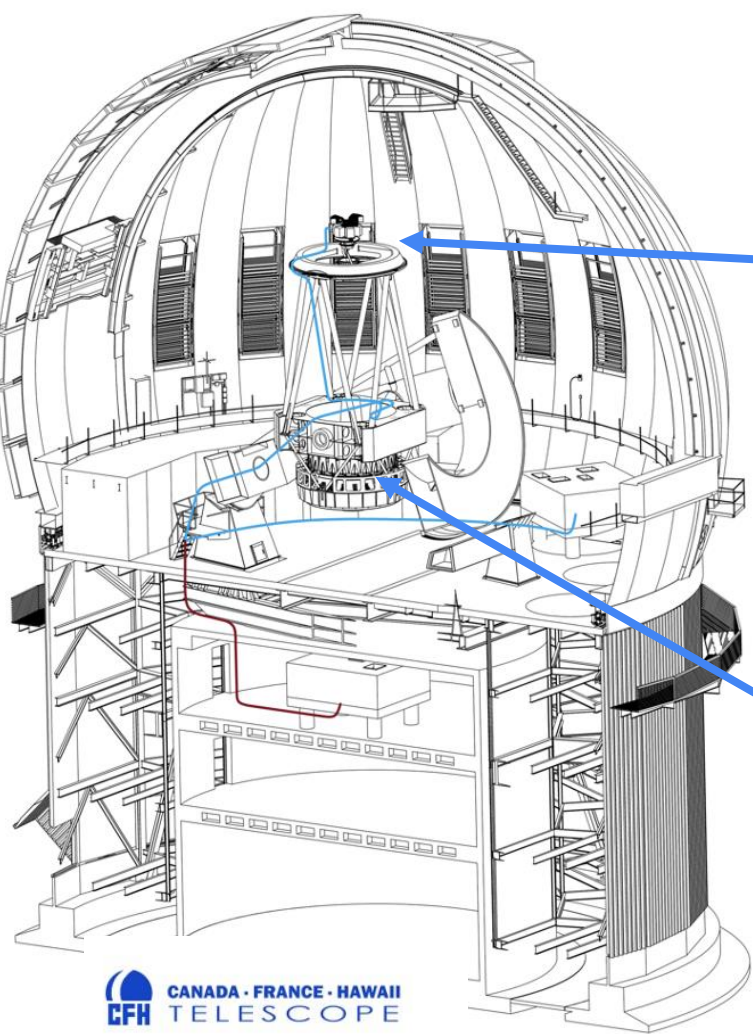


Path to MSE: Pathfinder instrument

(Integral Field Unit + Multi-Object Spectrograph)

- Pathfinder-IFU is a single large format 33×28.5”, fiber-fed integral field unit (IFU) that feeds highly efficient optical spectrographs that provide complete wavelength coverage from 360 nm to 980 nm at a minimum resolving power of ~3000.
- Pathfinder-MOS is a 1000 fiber MOS system covering 1.5 sq degrees feeding the same spectrographs.
 - Possible upgrades include high resolution spectroscopy and/or low-medium resolution in the NIR
- We are actively pursuing funding opportunities for this project, initially for the IFU





MOS



IFU



Pathfinder Science

Pathfinder's MOS and IFU instrument capabilities will enable a wide range of science cases from cosmology to stellar astrophysics, including:

- Time Domain and Transients
- Galactic Science
- Cosmology
- High-Energy astrophysics
- Galaxy Evolution

Pathfinder's spectroscopic data will maximize the science return from a variety of space- and ground-based facilities

- Gaia, eROSITA, Euclid, Plato, TESS, Roman, and JWST
- ZTF, Rubin, PTF, KIDS, DES, and SKA.



Thoughts? Concerns? Questions? Expressions of support?

- We are here to answer your questions and write down your thoughts
- You may raise your hand or ask a question in the chat
- You may add your thoughts in the chat
- Survey will open in mid-September and will stay open for 4 weeks

