



The logo features a red curved line on the left, followed by the text 'MAUNAKEA OBSERVATORIES' in white. Below this is 'CFHT' in large, light blue, block letters, and '40th' in a large, white, cursive font.

MAUNAKEA OBSERVATORIES  
CFHT  
40th

CELEBRATING 40 YEARS OF EXPLORATION

CÉLÉBRONS 40 ANS D'EXPLORATION

HE PIHA MAKAHIKI 40 O KA 'IMI LOA

A photograph of the Maunakea Observatories on a dark, volcanic landscape under a clear blue sky. Several white telescope domes are visible on the ridges.

**Celebrating 40 Years of Discovery  
and a Bright Future at CFHT**

Doug Simons  
Director - CFHT

Photo: Don Mitchell



# CFHT's 40<sup>th</sup> Anniversary!

Canada France Hawaii Telescope Presents

## 40<sup>th</sup> BIRTHDAY PARTY

Celebrating 40 Years of Exploration

BARBEQUE FACE PAINTING BOUNCY CASTLE  
BIRTHDAY CAKE CHARITY DUNK TANK

SEPTEMBER 28 ✦ SATURDAY 10AM-2PM

CFHT OFFICES 65-1238  
MAMALAOA HWY, WAIMEA



**FREE COMMUNITY EVENT!**





# *CFHT Users Meeting*



***“CFHT in the 2020s  
A Time of Research, Excellence and Transformation”  
CFHT Users’ Meeting 2019  
Montréal, Canada***



# Science Sampler



# Back to Work & Aloha 'aina

## Hawaii Tribune Herald

Saturday, August 10, 2019

Proudly serving Hilo and the Big Island since 1923

75 cents

# Back to the summit



The sun sets July 14 behind telescopes at the summit of Maunakea.

Associated Press file photo

## Astronomers to resume observations atop Maunakea

By MICHAEL BRESTOVANSKY  
*Hawaii Tribune-Herald*

After being grounded for four weeks, Maunakea Observatories announced Friday that astronomers will return to the summit and telescopes will resume observations.

Observatory spokespeople announced that astronomers and technicians will begin work on restoring the summit telescopes to full operations with the blessing of the state and Thirty Meter Telescope opponents.

Demonstrators occupying the roadway since July 16 had permitted astronomers back up the mountain last week after Gov. David Ige rescinded an emergency proclamation he issued regarding the protests. However, safety issues prevented the observatories from authorizing a full return to service.

Since the closure of Maunakea Access Road, technicians and other

See **ASTRONOMERS** Page A9

## Telescope confirms asteroid not a threat

Astronomers make observation just after returning to mountain

By MICHAEL BRESTOVANSKY  
*Hawaii Tribune-Herald*

Maunakea observatories returned to work last weekend and almost immediately discovered that the world will not end next year.

On Saturday night into Sunday morning, the Canada-France-Hawaii Telescope returned to operational status after four weeks of non-use and astronomers were able to confirm that an asteroid near Earth will not strike the planet next year or within the next century.

The asteroid, designated 2006 QV89, had previously only been observed between its discovery on Aug. 29, 2006, and Sept. 8 of that year. That observation window was not sufficient to entirely rule out a possible collision with Earth next month, however.

The European Southern Observatory's Very Large Telescope in Chile ruled out such a collision last month when it scanned the skies where the asteroid would appear if it were to strike the Earth in September and did not detect it. However, the potential trajectories of the asteroid indicated that an impact in 2020 was still possible, as well as 22 other potential impacts over the next century.

The asteroid is estimated to be roughly 30 meters in diameter, said David Tholen, an astronomer with the University of Hawaii's Institute for Astronomy who led the effort to recover the asteroid's trajectory. An object of similar size detonated in midair over

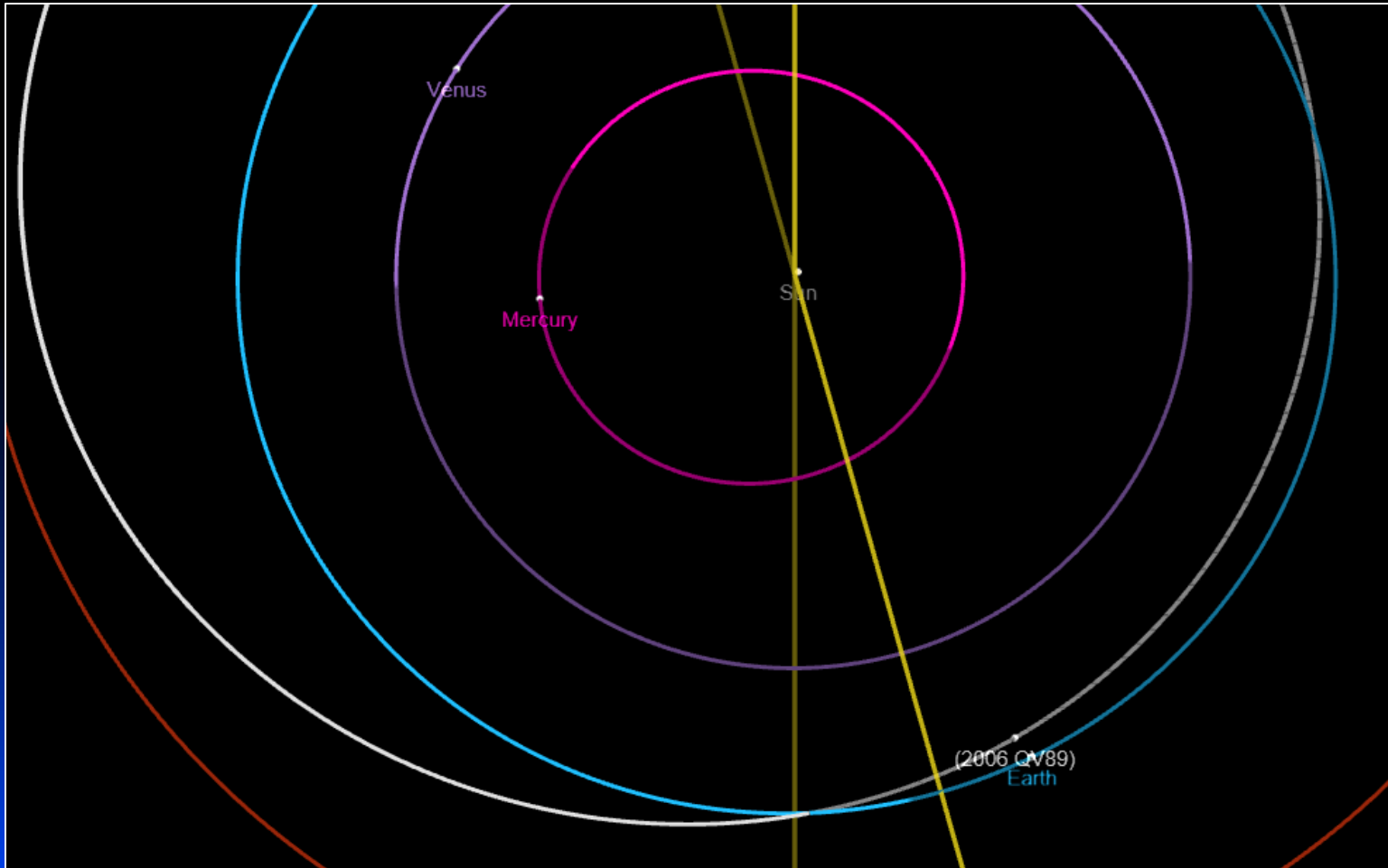


THOLEN



# *Virtual Impactor Remains "Virtual"*

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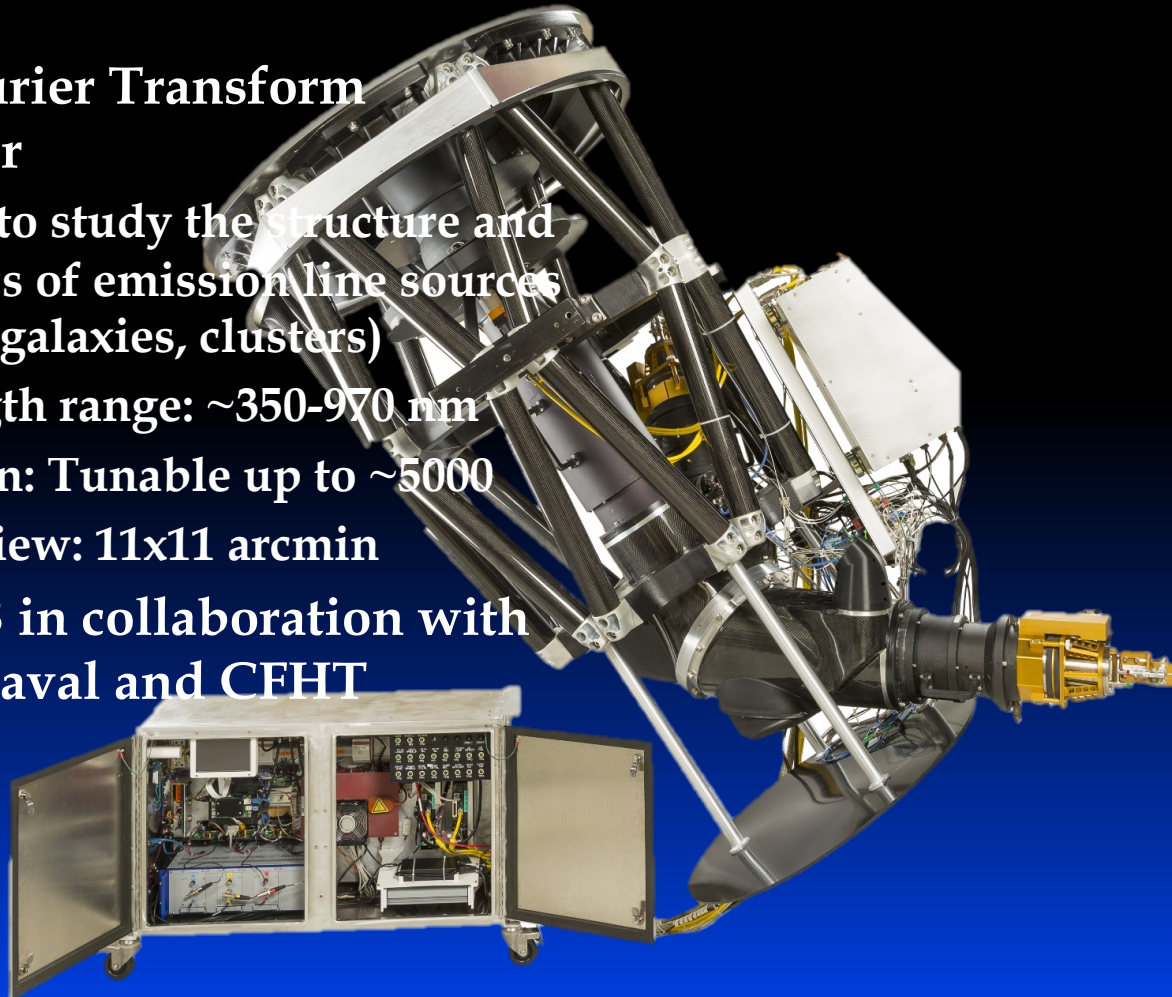




# *SITELLE*

## \* Imaging Fourier Transform Spectrometer

- \* Intended to study the structure and kinematics of emission line sources (nebulae, galaxies, clusters)
  - \* Wavelength range:  $\sim 350\text{-}970\text{ nm}$
  - \* Resolution: Tunable up to  $\sim 5000$
  - \* Field of view:  $11 \times 11$  arcmin
- \* Built at ABB in collaboration with Université Laval and CFHT



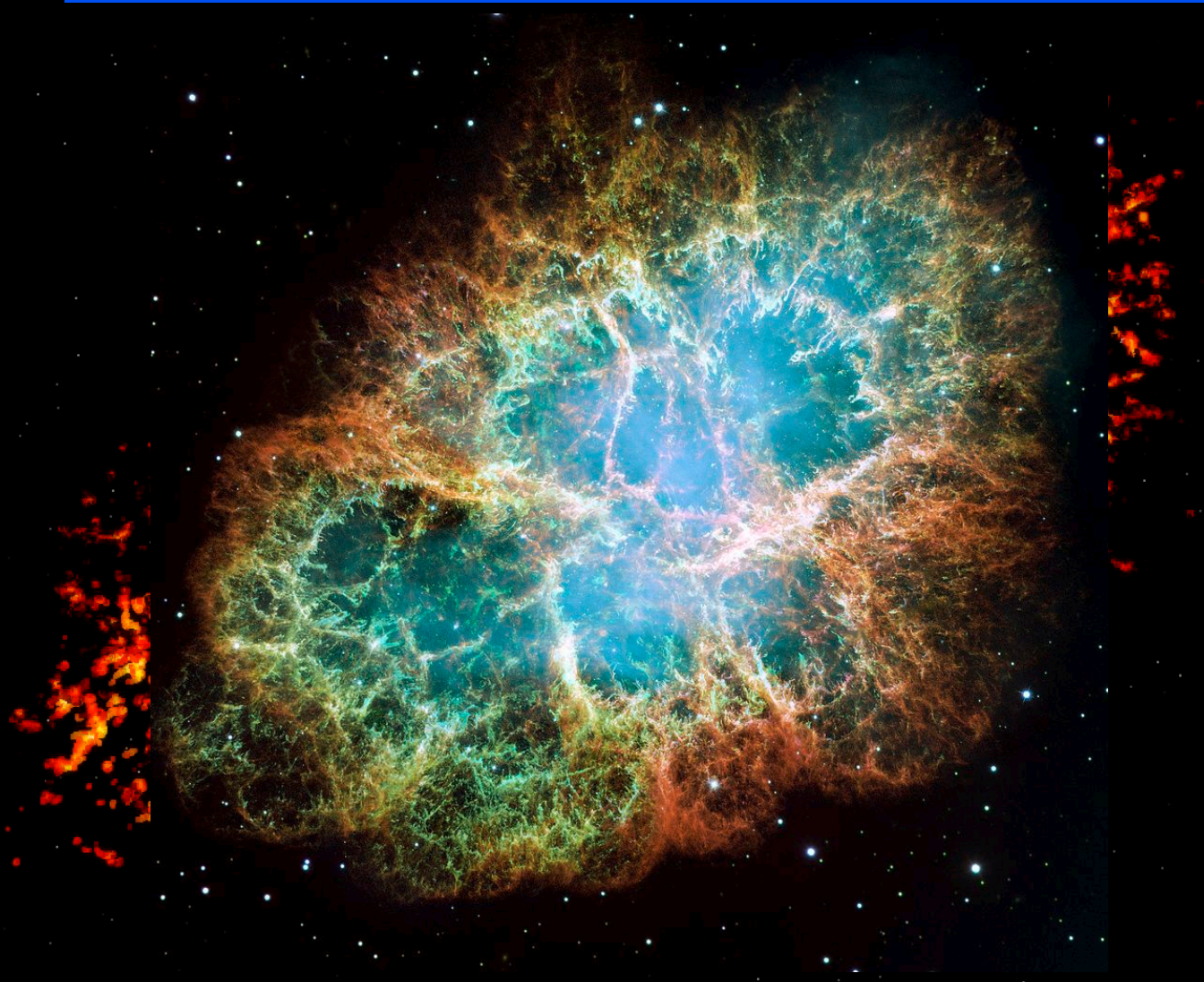




# *3D Imaging of a Supernova Remnant*

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None



M1Explorer



Outreach



# Maunakea Scholars

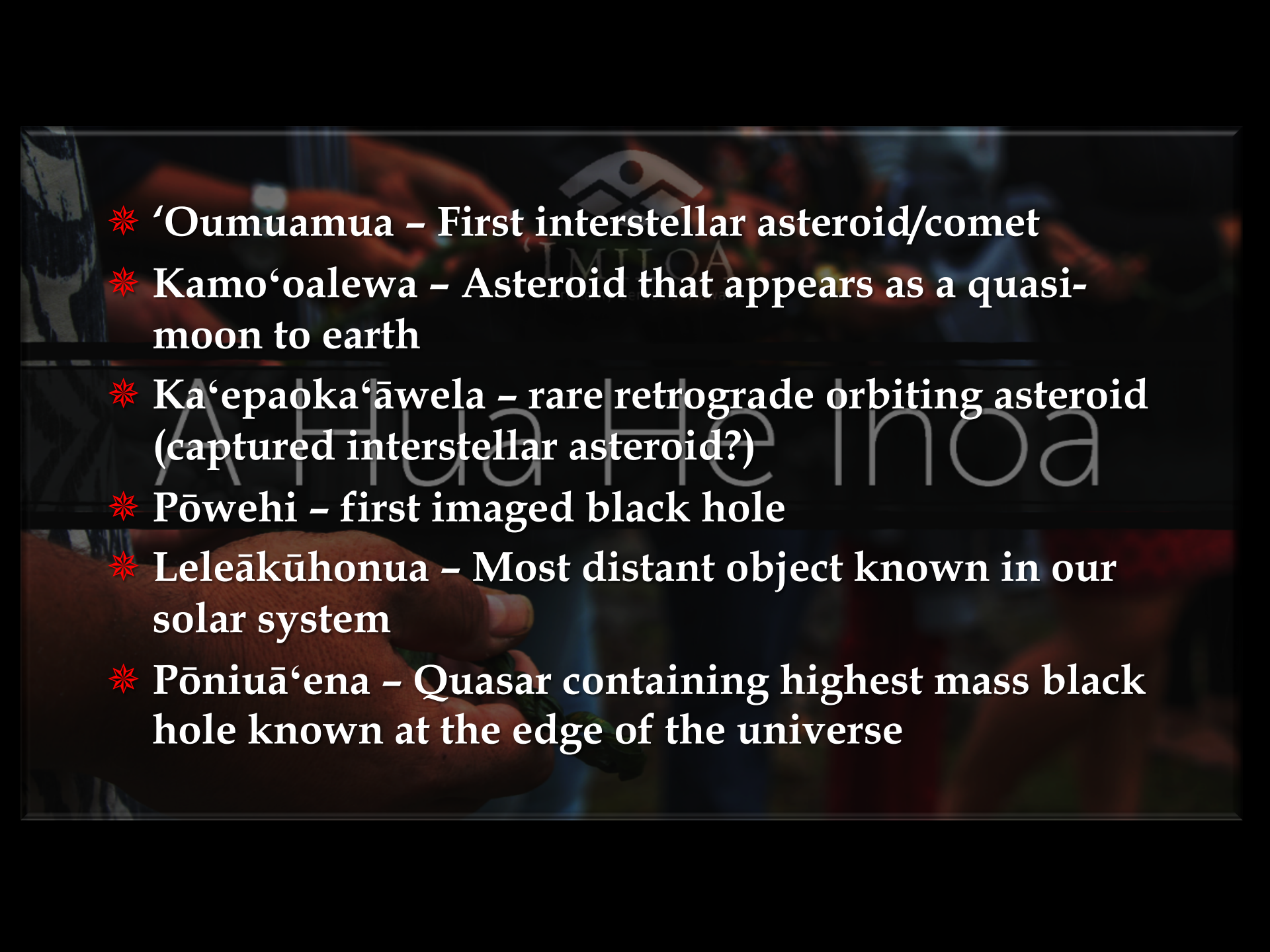
- ✿ 13 schools this year
- ✿ Program established on 6 islands
- ✿ On-line dual credit astronomy classes
- ✿ >500 students in program to date!



Hōkūala (Rising Star) Scholarship  
to JC Damaslan (Waipahu High)

Entered UH Manoa this year to  
major in astronomy



- 
- \* 'Oumuamua – First interstellar asteroid/comet
  - \* Kamo'oailewa – Asteroid that appears as a quasi-moon to earth
  - \* Ka'epaoka'awela – rare retrograde orbiting asteroid (captured interstellar asteroid?)
  - \* Pōwehi – first imaged black hole
  - \* Leleākūhonua – Most distant object known in our solar system
  - \* Pōniuā'ena – Quasar containing highest mass black hole known at the edge of the universe

# The Physics of Pō

Lessons from Nature

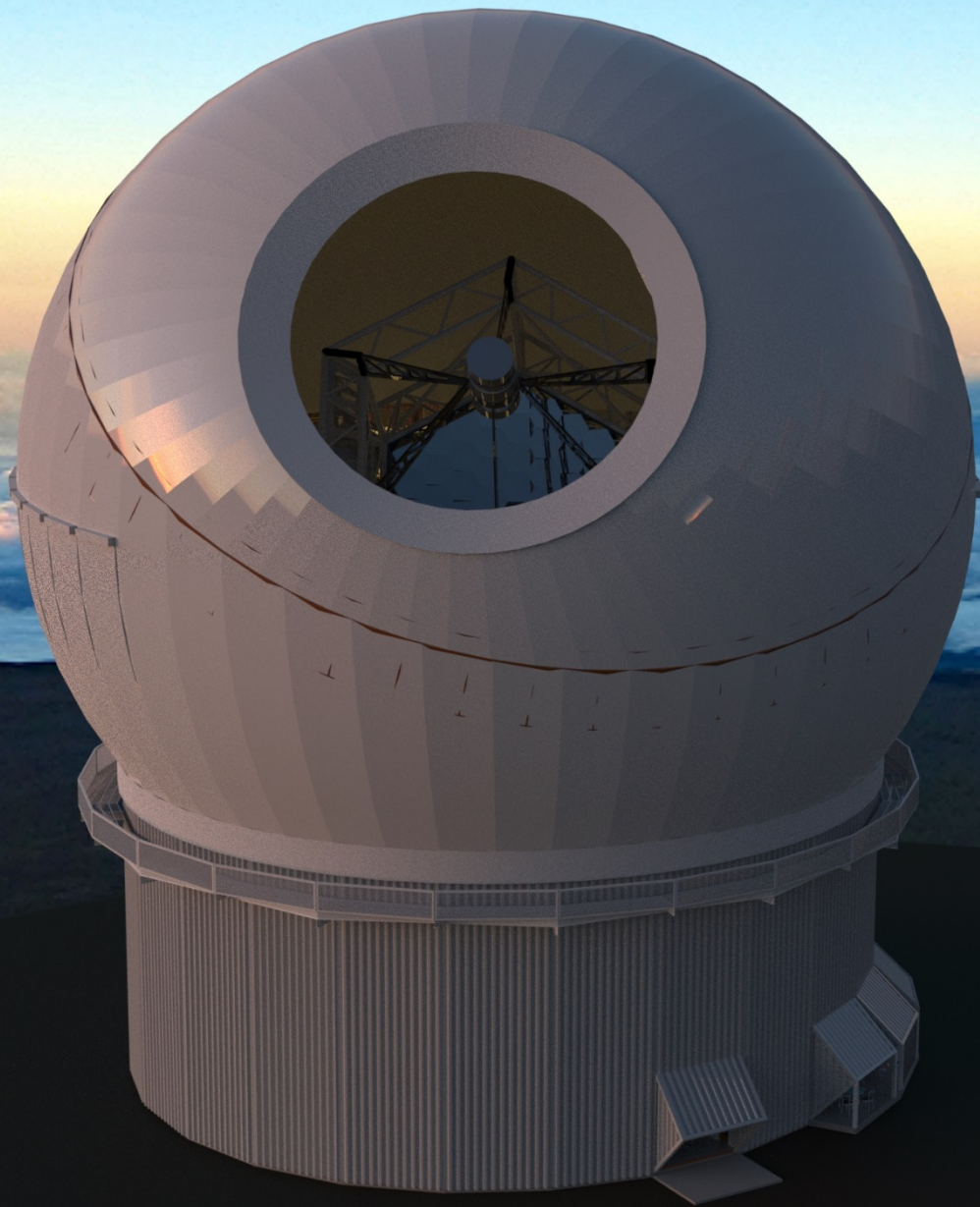


**AAS Conference Public Presentation**  
**Hawaii Convention Center**  
**January 6, 2020**



A large, white, dome-shaped structure, likely an observatory, is shown against a dark blue sky. The dome has several windows with orange interior lights visible. The text "Future Plans..." is overlaid in white, serif font across the middle of the dome. The structure has a corrugated metal base and a balcony-like structure at the bottom.

Future Plans...

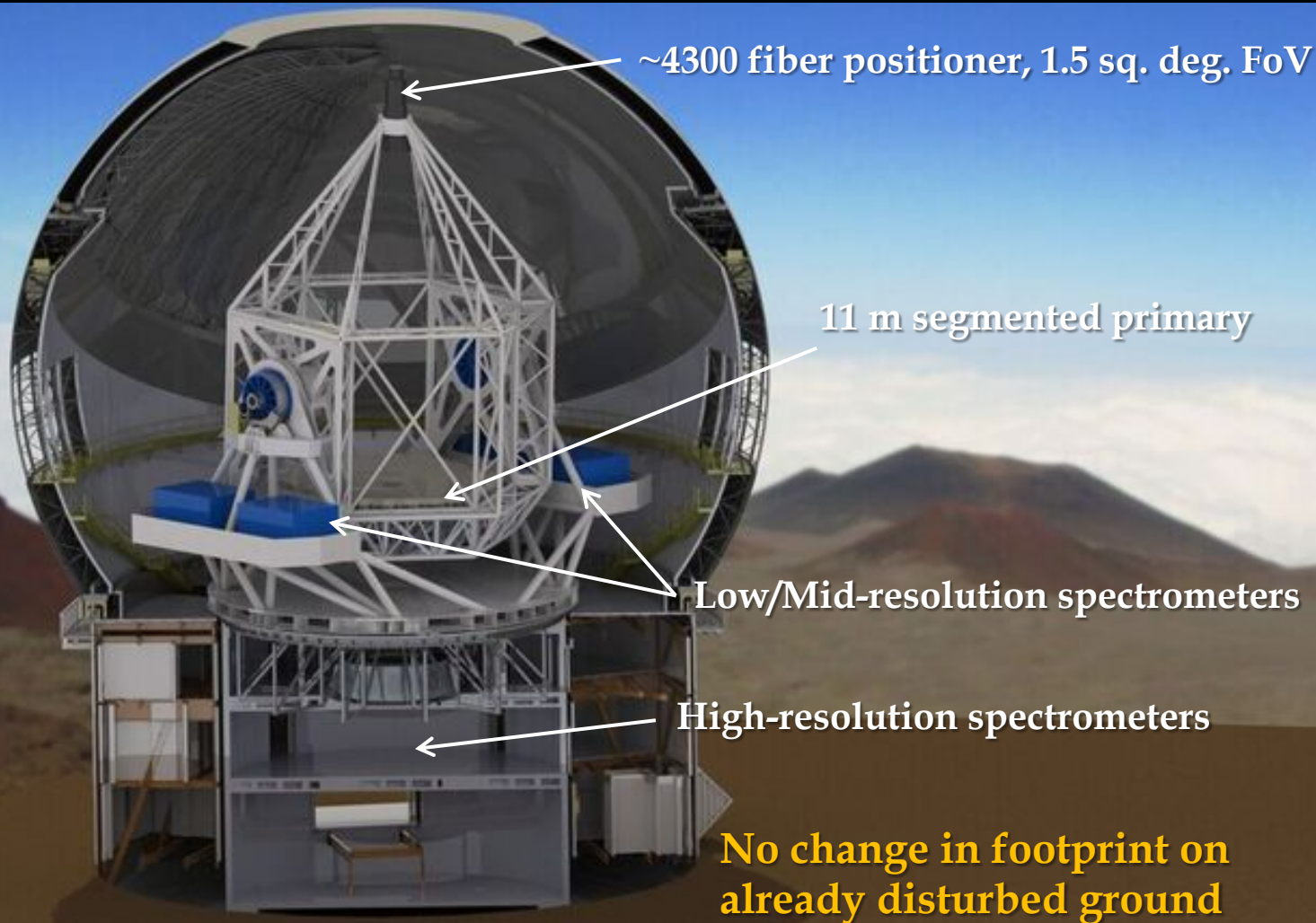


Maunakea Spectroscopic Explorer



Maunakea Spectroscopic Explorer

# Essential Design Elements



~4300 fiber positioner, 1.5 sq. deg. FoV

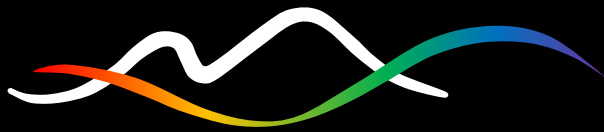
11 m segmented primary

Low/Mid-resolution spectrometers

High-resolution spectrometers

**No change in footprint on  
already disturbed ground**





Maunakea Spectroscopic Explorer

# MSE Science



**Chemical nucleosynthesis**  
Sivarani Thirupathi & David Yong

**Exoplanets and stellar astrophysics**  
Maria Bergemann & Daniel Huber

Ti 22	V 23	Cr 24	Mn 25	Fe 26	Co 27	Ni 28	Cu 29	Zn 30	Ga 31	Ge 32
Zr 40	Nb 41	Mo 42	Tc 43	Ru 44	Rh 45	Pd 46	Ag 47	Cd 48	In 49	Sn 50



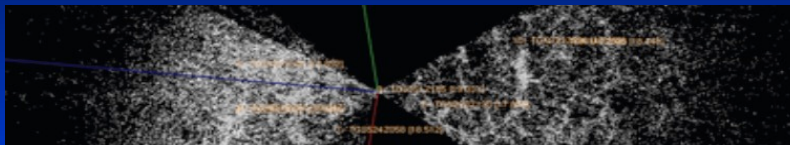
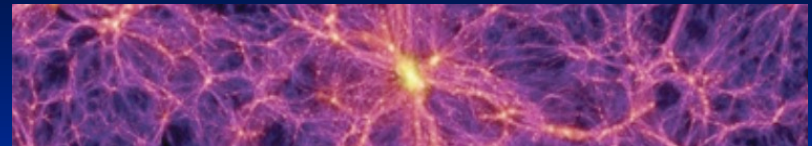
**Galaxy Formation and evolution**  
Kim-Vy Tran & Aaron Robotham

**Milky Way and resolved stellar pops**  
Carine Babusiaux & Sarah Martell



**AGN and supermassive black holes**  
Yue Shen & Sara Ellison

**Astrophysical tests of dark matter**  
Ting Li & Manoj Kaplinghat



**Time domain astronomy and transients**  
Adam Burgasser & Daryl Haggard

**Cosmology**  
Will Percival & Christophe Yèche





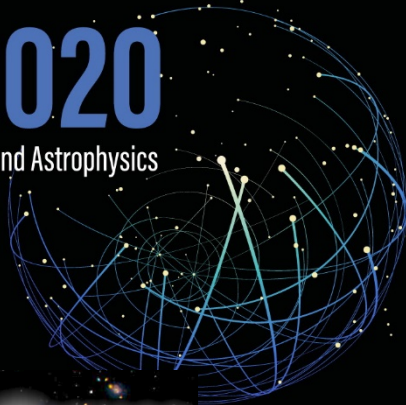
Maunakea Spectroscopic Explorer

# International Strategic Planning

## Astro 2020

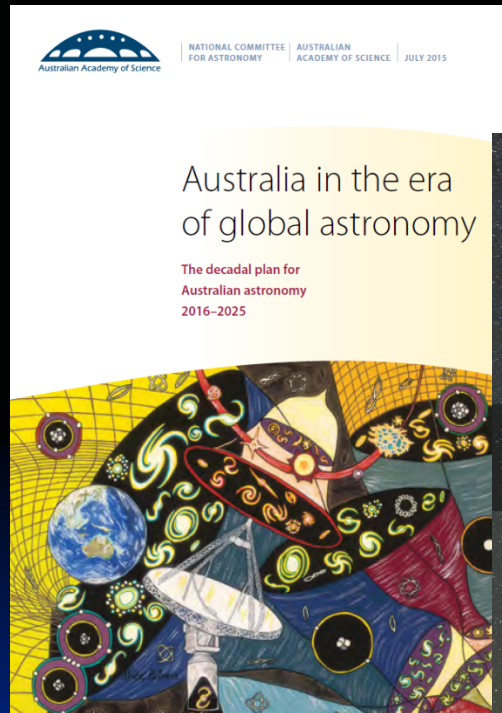
Decadal Survey on Astronomy and Astrophysics

The National Academies of SCIENCES ENGINEERING MEDICINE



## Unveiling the Cosmos

A Vision for Canadian Astronomy  
Report of the Long Range Plan 2010 Panel



Plus 2020 French Prospectiv,  
strategic planning in China, etc...

# Important CFHT/MSE Distinctions

- \* 40 year presence of CFHT in the community has enormous value in making the case for MSE
- \* Will not seek MSE permits until Maunakea Science Reserve Master Lease is renewed – *focus of my attention these days*
  - \* *In general expect those opposed to MSE are opposed to all telescopes on Maunakea in the future – Master Lease Renewal*
- \* MSE has identical footprint as CFHT and is on “previously disturbed” land
- \* CFHT site identified as recyclable under Comprehensive Management Plan
- \* Extensive/innovative CFHT community engagement



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CÉLÉBRONS 40 ANS D'EXPLORATION

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*Mahalo...*

