



National Aeronautics and
Space Administration

How Quantum is Driving Innovation at NASA

Carolyn R. Mercer, Ph.D.

Chief Technologist for NASA's Science Mission Directorate

Quantum.Tech

Washington DC April 16, 2025

Big Goals Drive Innovation

PROTECT & IMPROVE
LIFE ON EARTH &
IN SPACE

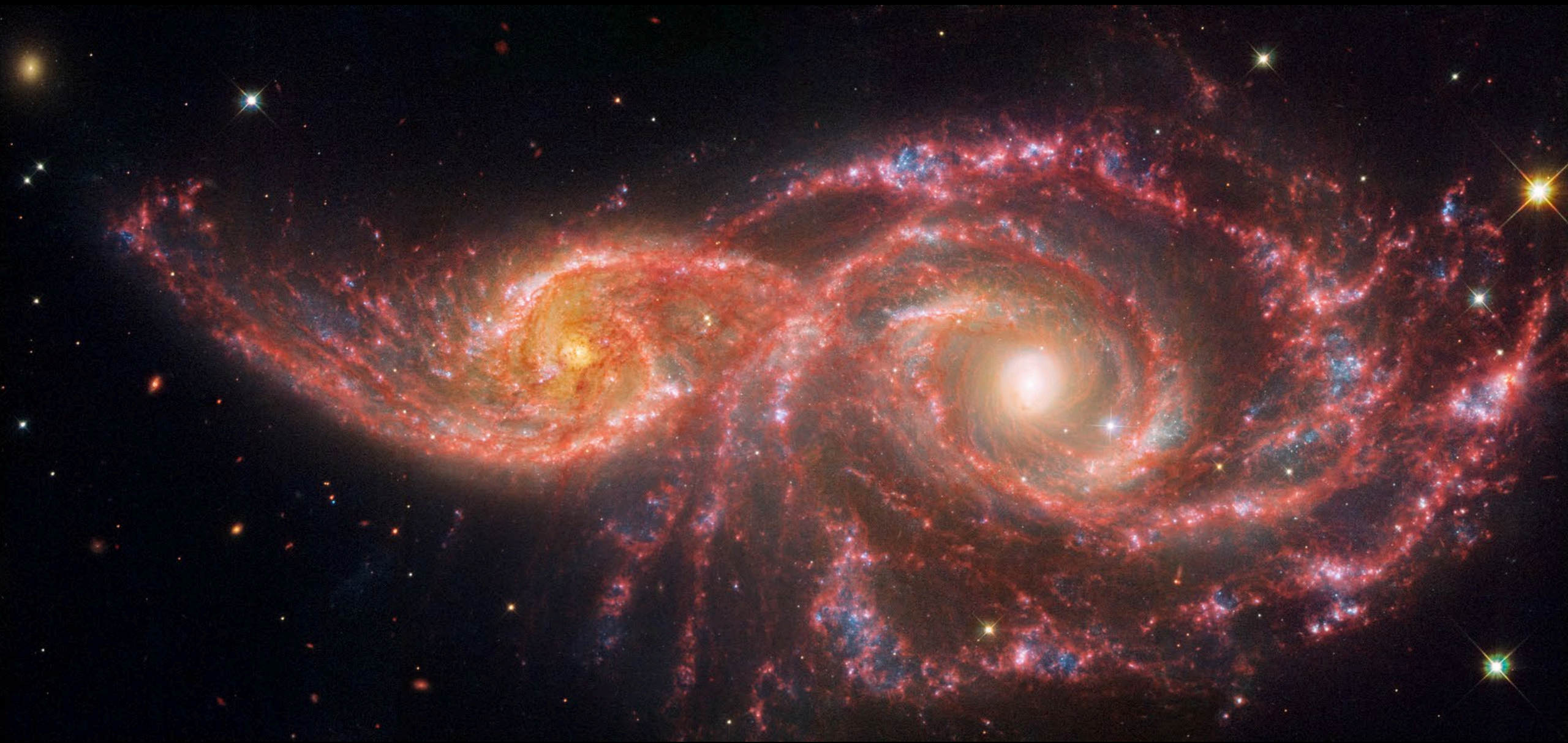


SEARCH FOR LIFE
ELSEWHERE

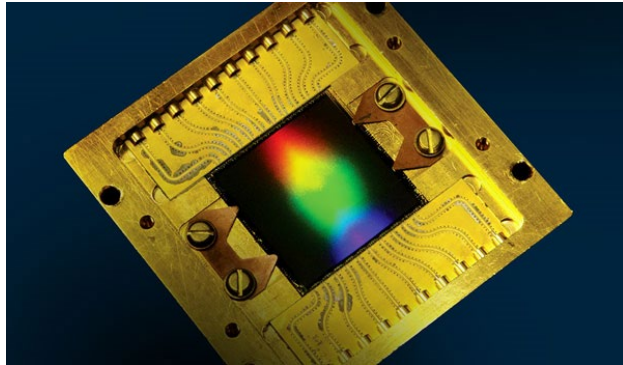


DISCOVER SECRETS
OF THE UNIVERSE

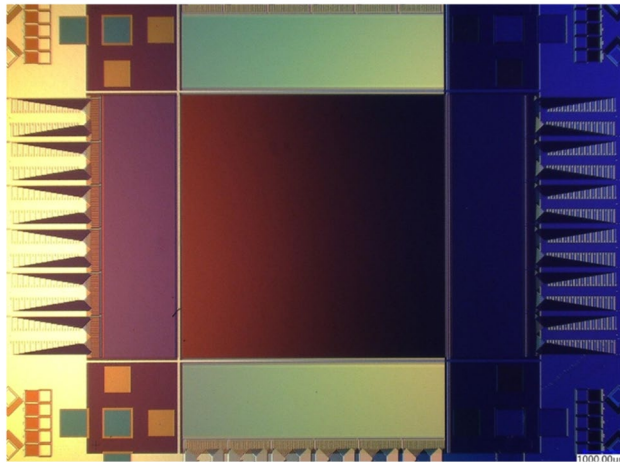
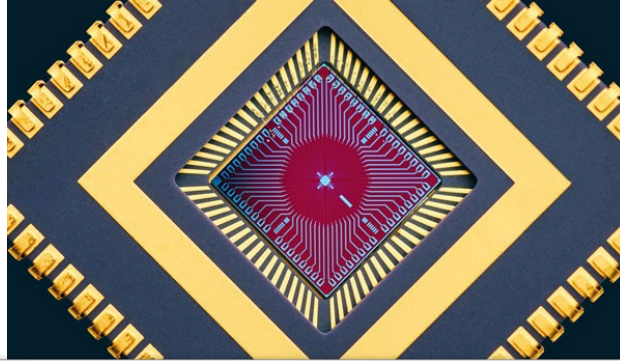




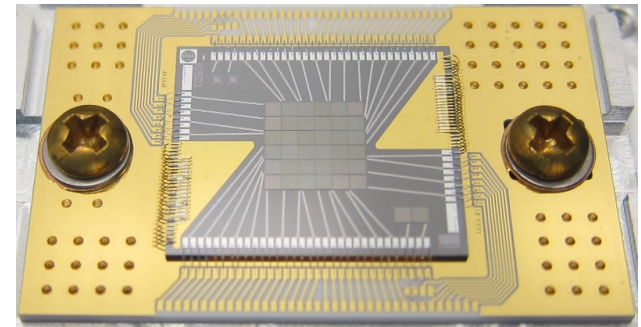
DISCOVER THE SECRETS OF THE UNIVERSE: Galaxies IC 2163 and NGC 2207 (Hubble and James Webb Space Telescopes)



Microwave Kinetic Inductance Detector
NASA JPL

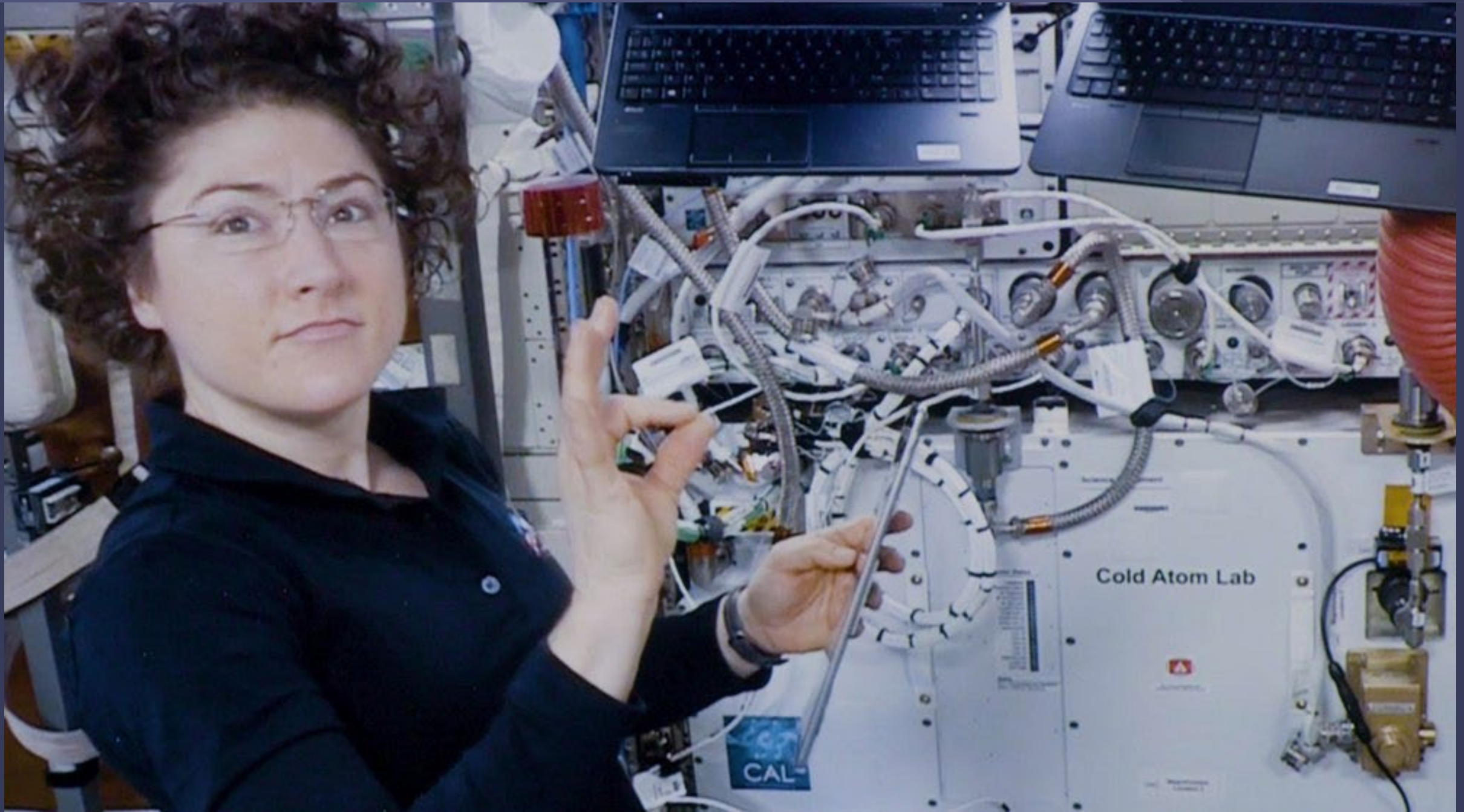


Single Nanowire Single Photon Detector
NASA JPL (top) NIST (bottom)



Quantum Calorimeter Array
NASA GSFC

DISCOVER THE SECRETS OF THE UNIVERSE: International Space Station (Cold Atom Lab)



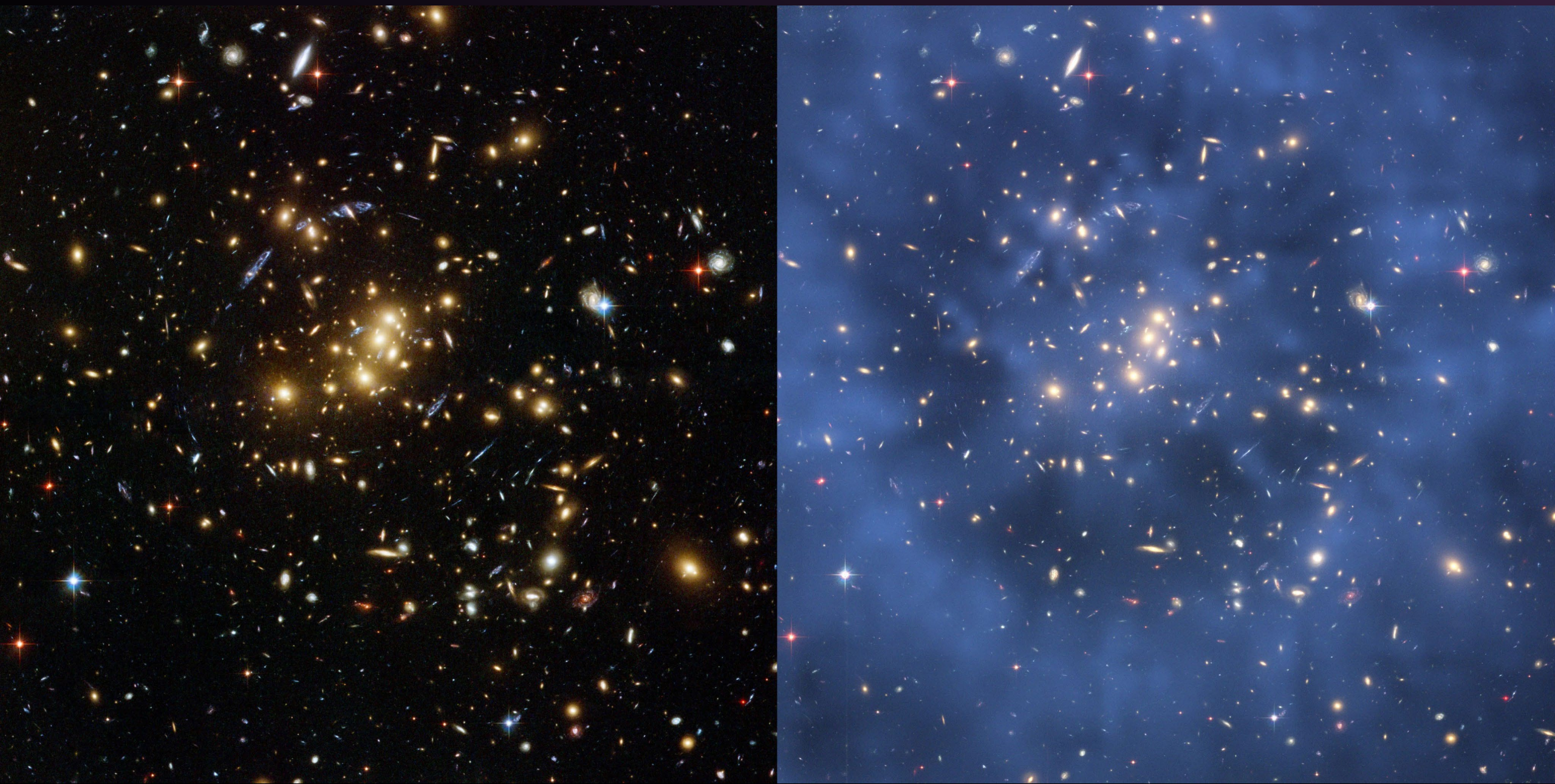
DISCOVER THE SECRETS OF THE UNIVERSE: International Space Station (Cold Atom Lab)



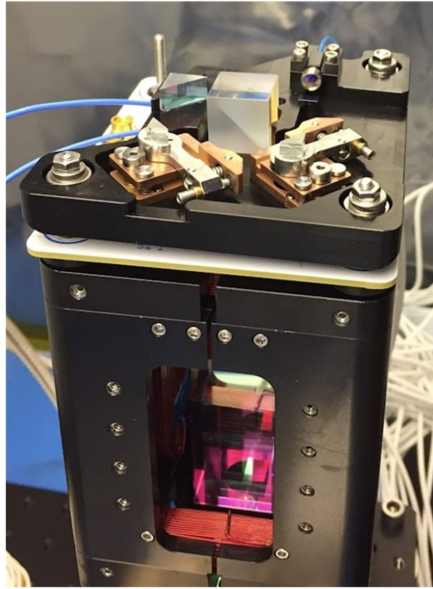
Cold Atom Lab physics package
NASA JPL



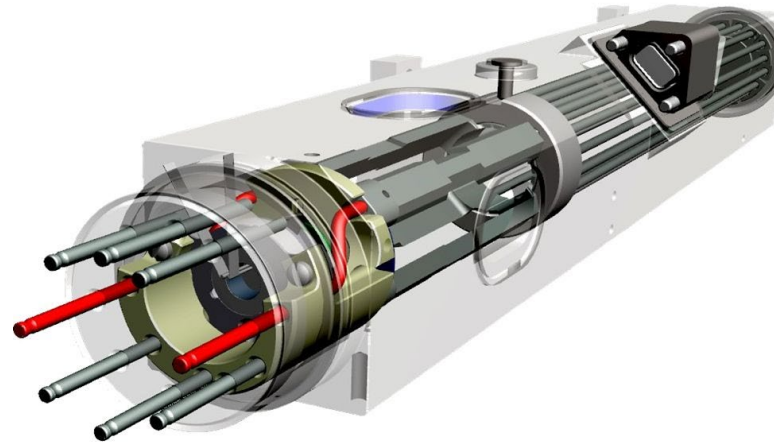
DISCOVER THE SECRETS OF THE UNIVERSE: Galaxy Cluster CL 0024 + 17 (Hubble Space Telescope)



DISCOVER THE SECRETS OF THE UNIVERSE: Galaxy Cluster CL 0024 + 17 (Hubble Space Telescope)

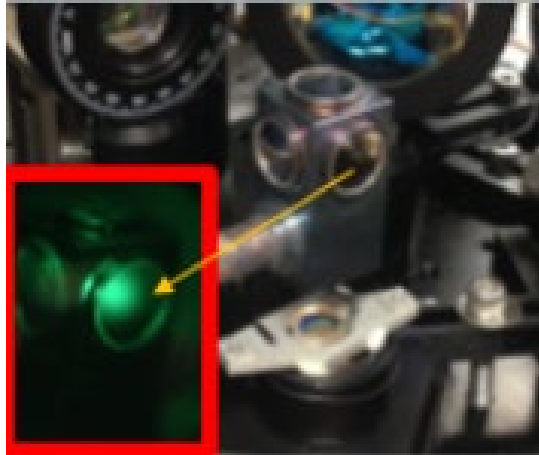
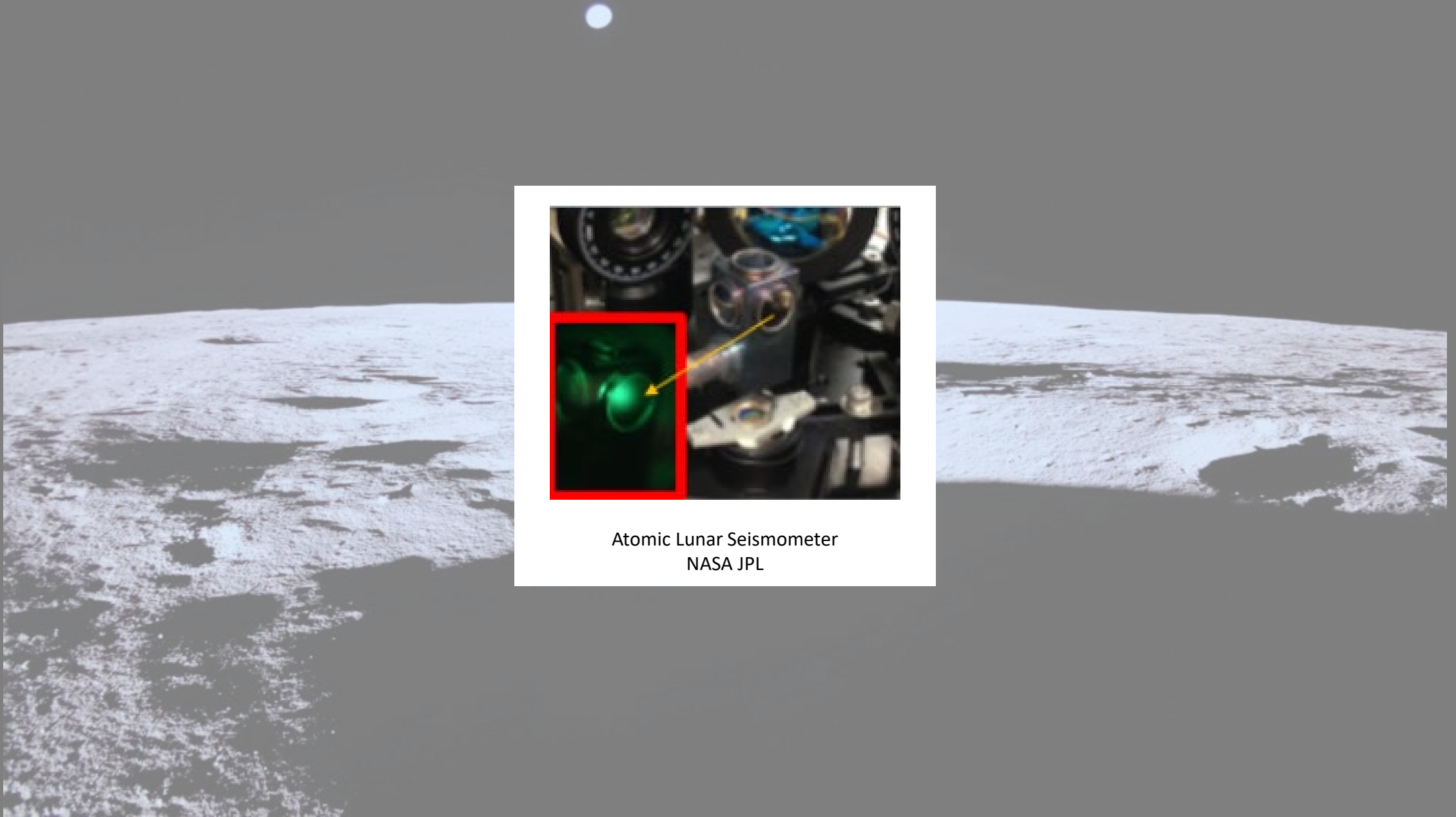


Cold Atom Lab physics package –
representative concept only

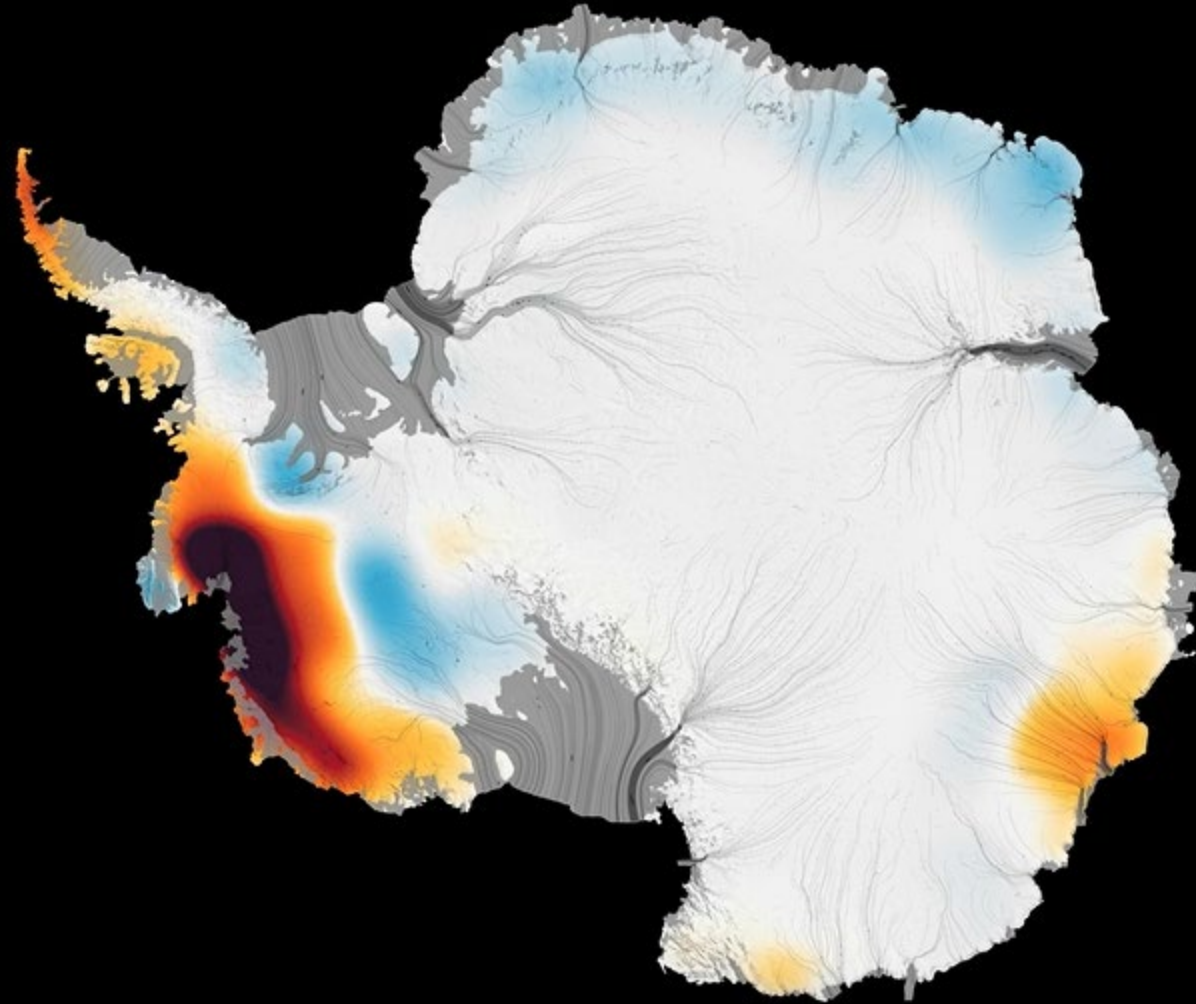


Deep Space Atomic Clock
NASA JPL

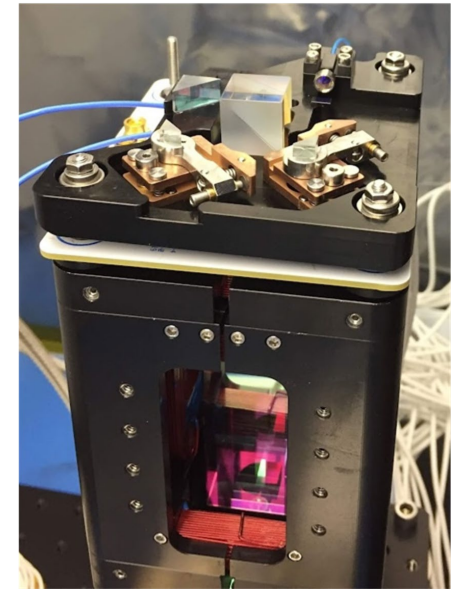
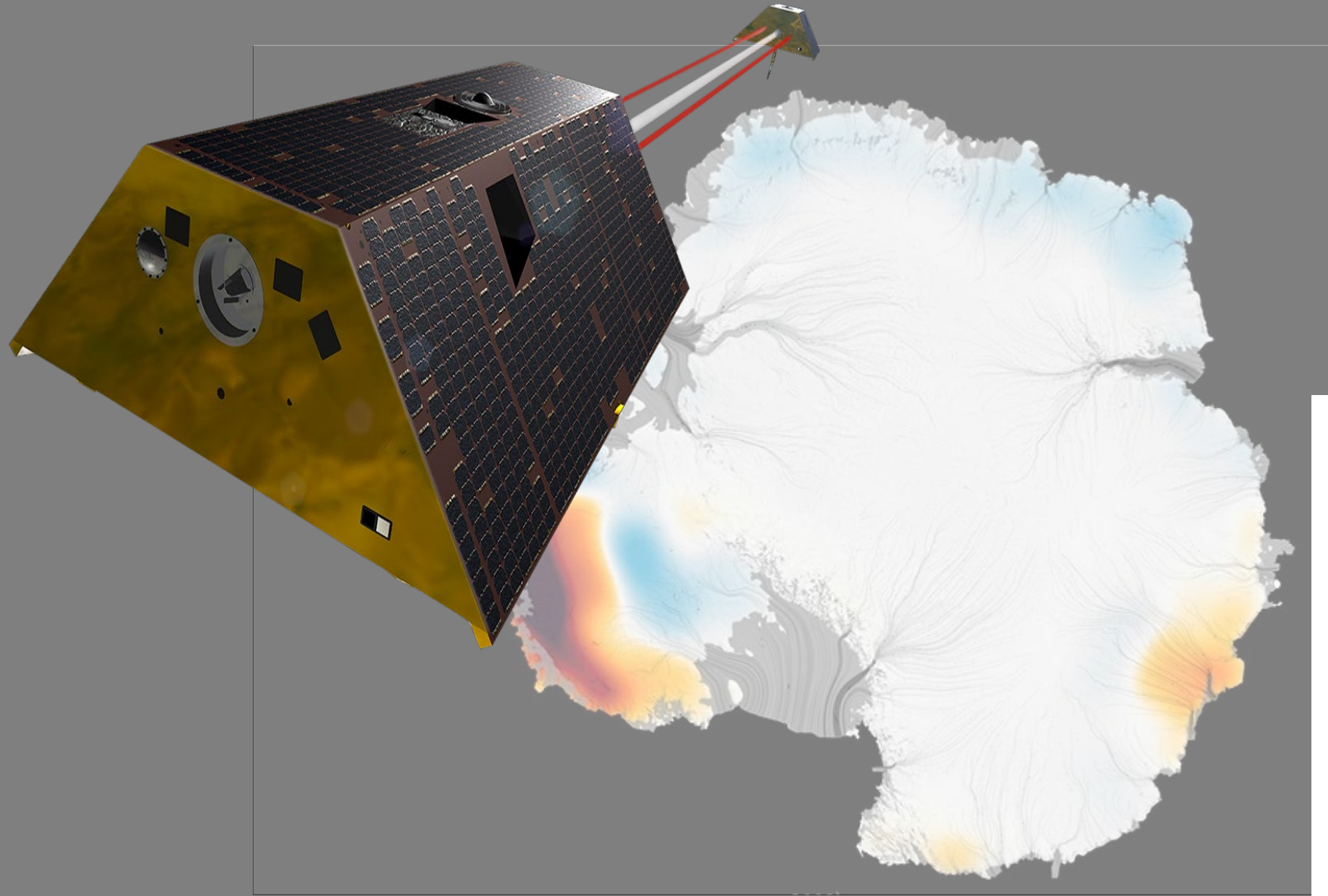




Atomic Lunar Seismometer
NASA JPL

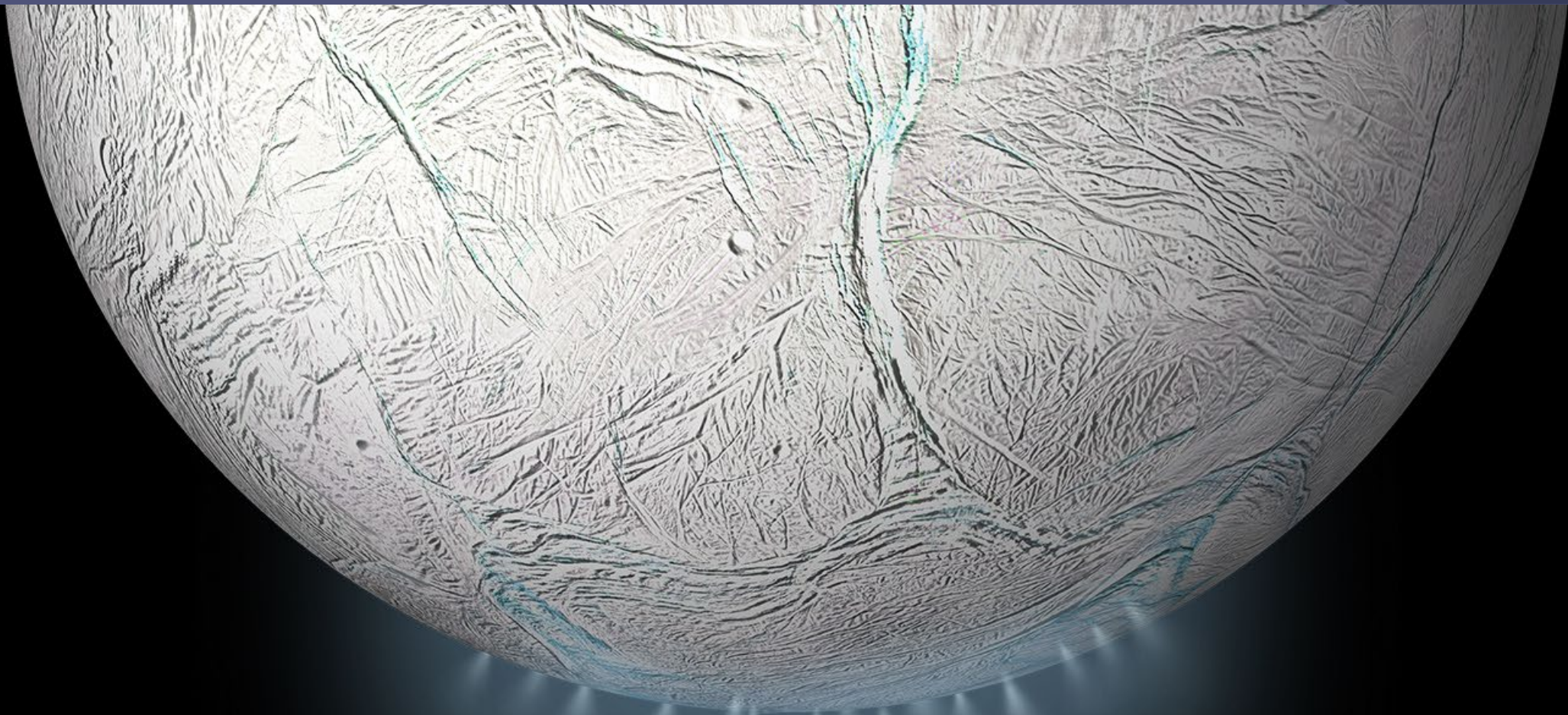


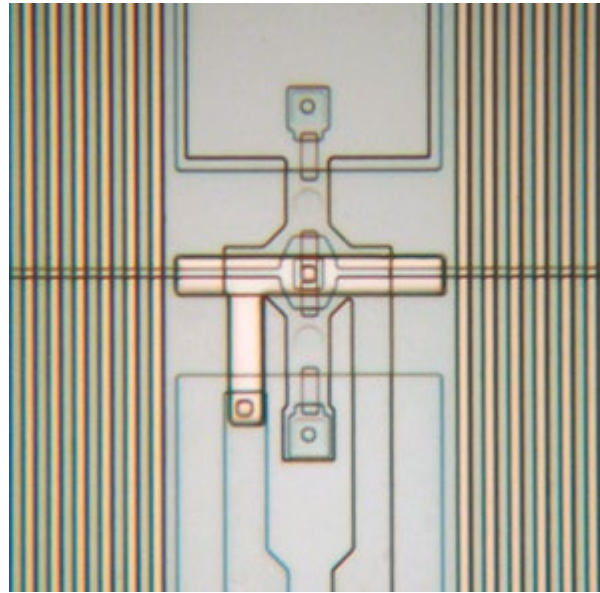
PROTECT AND IMPROVE LIFE ON EARTH AND IN SPACE - Antarctica (GRACE-FO)



Cold Atom Lab physics package –
representative concept only

SEARCH FOR LIFE ELSEWHERE: Enceladus (Cassini)





SQUID Amplifier Input Stage
STAR Cryoelectronics, LLC

Big Goals Drive Innovation

PROTECT & IMPROVE
LIFE ON EARTH &
IN SPACE



SEARCH FOR LIFE
ELSEWHERE



DISCOVER SECRETS
OF THE UNIVERSE

