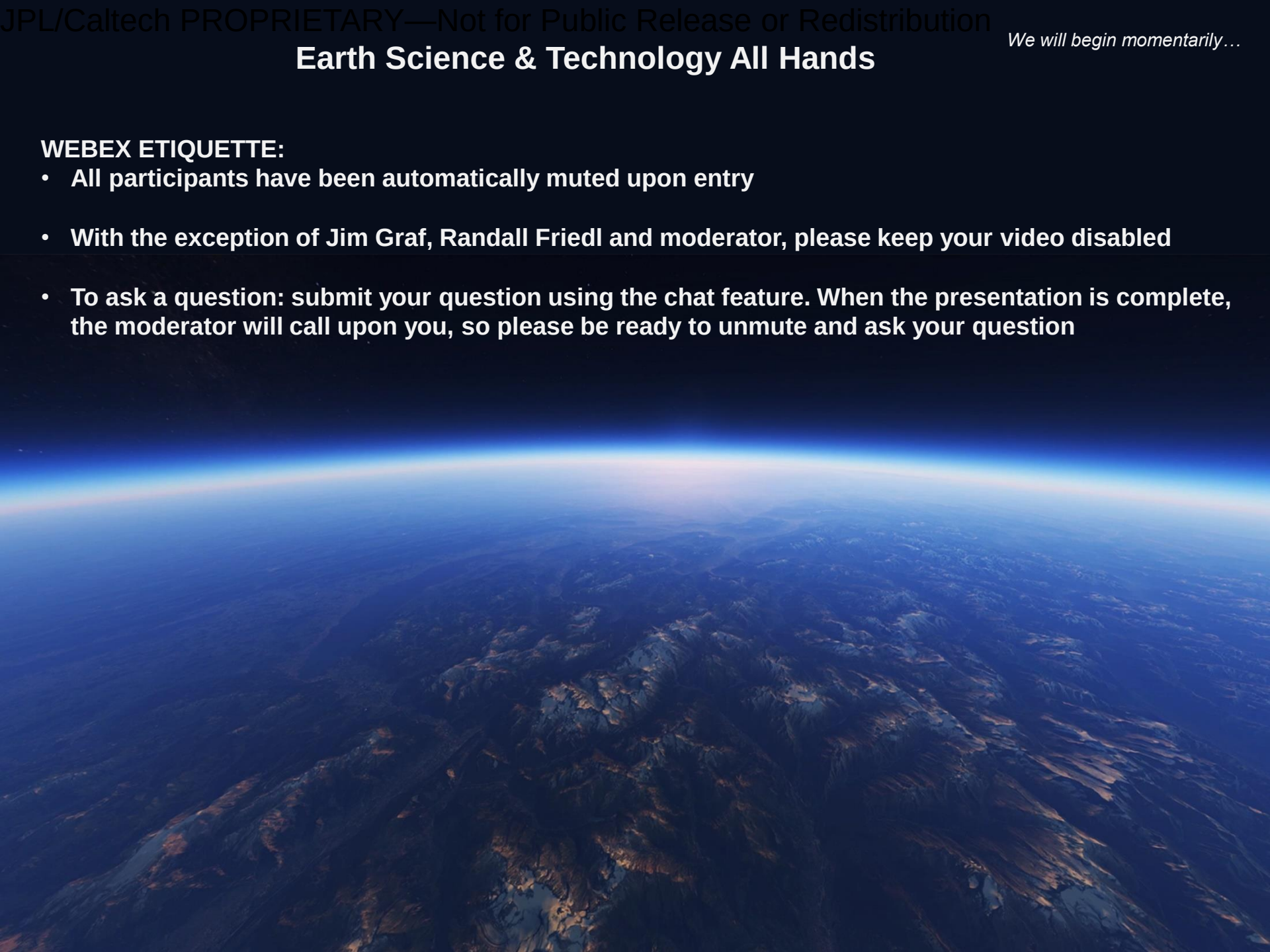
We will begin momentarily…

Earth Science & Technology All Hands

WEBEX ETIQUETTE:

- **All participants have been automatically muted upon entry**
- **With the exception of Jim Graf, Randall Friedl and moderator, please keep your video disabled**
- **To ask a question: submit your question using the chat feature. When the presentation is complete, the moderator will call upon you, so please be ready to unmute and ask your question**



Organizational Changes

800
EARTH SCIENCE AND TECHNOLOGY DIRECTORATE

James Graf, DIRECTOR
Randall Friedl, DEPUTY DIRECTOR
Duane Waliser, CHIEF SCIENTIST
Jessica Neu, ASSOCIATE CHIEF SCIENTIST (AD)
Jason Hyon, CHIEF TECHNOLOGIST
Daniel Limonadi, CHIEF SYSTEMS ENGINEER
TBD, CHIEF ENGINEER
Margaret Nice, EXECUTIVE ASSISTANT

801 BUSINESS ADMINISTRATION OFFICE — Brett Ramaker

802 GLOBAL CHANGE & ENERGY OFFICE — Mike Gunson; Ken Wolfenbarger (DM, AD)

803 BUSINESS OPERATIONS OFFICE — Jim Hoffman

805 TECHNOLOGY ADVISORY COUNCIL — Jason Hyon (AD)

810 NATIONAL DEFENSE AND MILITARY PROGRAM OFFICE — Randy Odle
- 811 NATIONAL DEFENSE PROGRAMS — Robert Stirbl
- 812 MILITARY PROGRAMS — Edward Cabrera

815 INFORMATION & DATA SCIENCE OFFICE — Richard Doyle

820 CIVIL & COMMERCIAL SPACE PROGRAM OFFICE — Ken Wolfenbarger
- 821 CIVIL PROGRAMS — Edward Chow
- 822 COMMERCIAL PROGRAMS — Indrani Graczyk

830 EARTH SCIENCE RESEARCH & MISSION FORMULATION OFFICE — Frank Webb; Sabrina Feldman (DM)
- 831 SCIENCE RESEARCH & CONCEPT DEVELOPMENT — Robert Ferraro
- 832 TECHNOLOGY RESEARCH & CONCEPT DEVELOPMENT — Eastwood Im
- 833 APPLIED SCIENCES RESEARCH — Sharon Kedar (AD)
- 834 MISSION APPLICATIONS — Mike Gunson (AD)
- 835 Western Water Applications — Indrani Graczyk (AD)

840 MULTI-ANGLE IMAGER FOR AEROSOLS — Kevin Burke

855 SURFACE WATER OCEAN TOPOGRAPHY — Parag Vaze; Said Kaki (DM)

845 EARTH SURFACE MINERAL DUST SOURCE INVESTIGATION — Charlene Ung

860 SENTINEL-6 — Parag Vaze (AD); John Oswald (DM)

865 SYNTHETIC APERTURE RADAR MISSION — Kent Kellogg; Phil Barela (DM)

870 EARTH SCIENCE INSTRUMENTS & TECHNOLOGY OFFICE — Gary Lau
- 871 INSTRUMENT TECHNOLOGY & TEST BEDS — Eastwood Im (AD)
- 872 SUB-ORBITAL INSTRUMENTS — Henry Abakians (AD)
- 873 DATA SYSTEMS & TECHNOLOGY — Dan Crichton (AD)
- 874 COSMIC-2 — Jeffrey Tien (AD)
- 875 COWVR — Amarit Kitiyakara (AD)
- 876 NTS-3 Experiment — Yoaz Bar-Sever (AD)
- 878 PREFIRE — Mary White (AD)

880 EARTH SCIENCE MISSIONS OFFICE — Mark Fujishin; Deborah Vane (DM)
- 88A AIRS — Thomas Pagano (AD)
- 88B ASTER — Bjorn Eng (AD)
- 88C MISR — Earl Hansen (AD)
- 88D MLS — Richard Lay (AD)
- 88E TES — Richard Lay (AD)
- 88F ECOSTRESS — Dana Freeborn (AD)
- 88G CLOUDSAT PROJECT — Deborah Vane (AD); Mona Witkowski (DM) (AD)
- 88H GRACE — Rob Gaston (AD)
- 88I JASON-3 — Glenn Shirtliffe (AD)
- 88J QUIKSCAT — Rob Gaston (AD)
- 88K OSTM — Glen Shirtliffe (AD)
- 88L0 GRACE FOLLOW-ON — Rob Gaston
- 88M OCO-2 MISSION — Mark Garcia (AD)
- 88N OCO-3 MISSION — Ralph Basilio
- 88R SOIL MOISTURE ACTIVE PASSIVE MISSION — Mark Garcia (AD)

885 INTEGRATED EARTH MISSION SYSTEM OFFICE — Jennifer Cruz

890 EARTH SYSTEMATIC MISSIONS PROGRAM OFFICE - JPL — Steven Bard; Amit Sen (DM); Ralph Basilio (PM-C)

DIVISION REPRESENTATIVES

1X	Scott Lewicki
26X	Kirk Bilby
Div. 31	Erik Nilsen
Div. 32	Sue Owen
Div. 33	Tom Jedrey
Div. 34	Genji Arakaki
Div. 35	Virgil Mireles/Gani Ganapathi
Div. 38	James Holden / Jamie Nastal
Div. 39	Andrew Bingham
5X:	Tom Ramsey

LEGEND

AD – Additional Duty
AM – Acting Manager
DM – Deputy Manager
DPI – Dep. Principal
PS – Project Scientist
TBD – To Be Determined
PM-C– Program Manager for Competed Missions

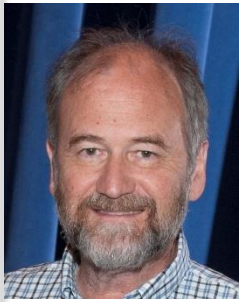
August 13, 2020

830
Earth Science Research & Formulation Office

Discipline Program Managers

Applied Sciences
Sharon Kedar **(Applications)**
Mike Gunson **(Missions)**


Weather
Robert Ferraro



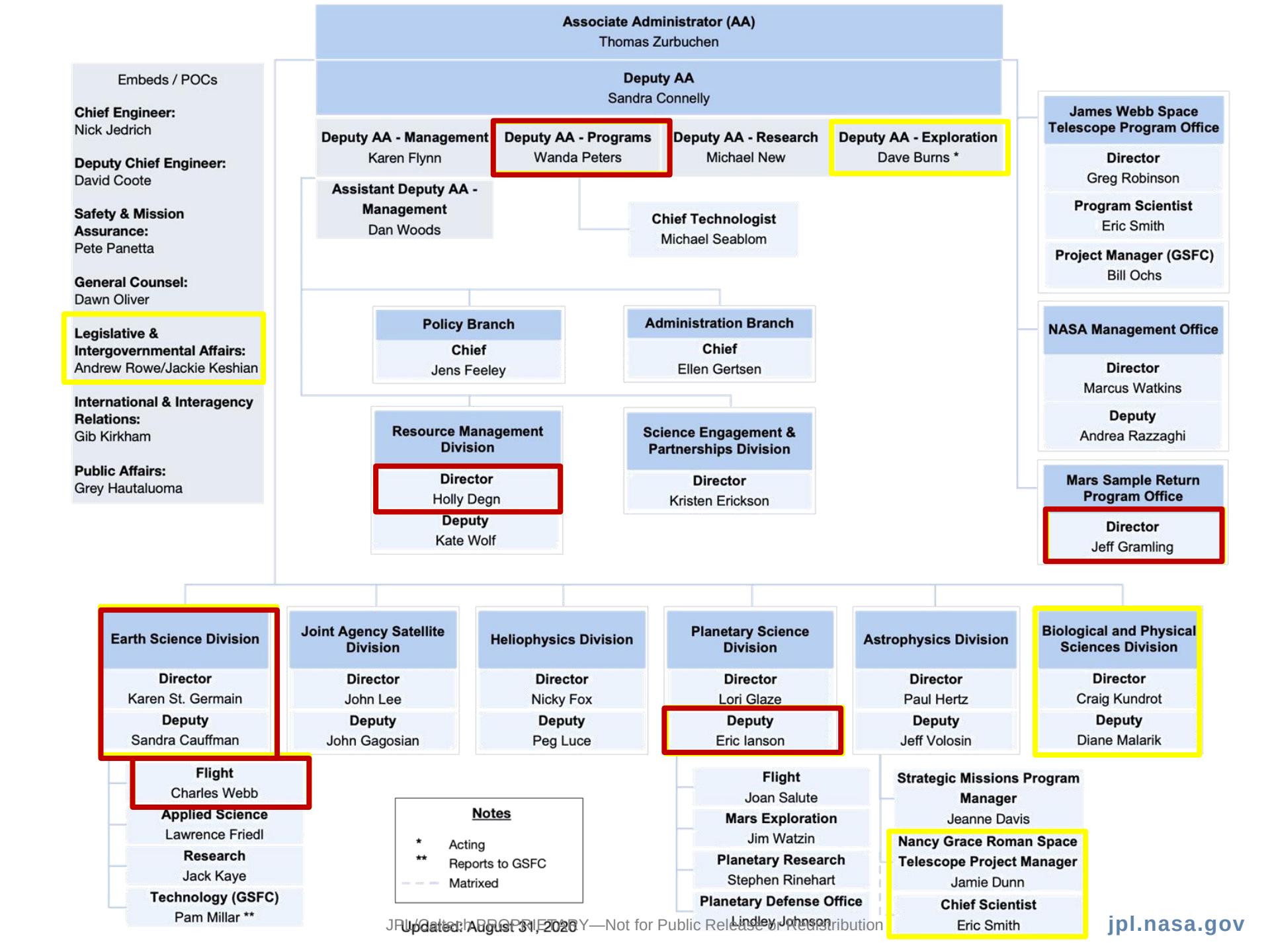
Atmosphere Composition
Jessica Neu

Carbon Cycle & Ecosystems
Chip Miller

Water & Energy Cycle
Son Nghiem

Earth Surface & Interior
Paul Lundgren

Climate Variability & change
Victor Zlotnicki

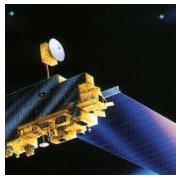


Updated: August 31, 2020

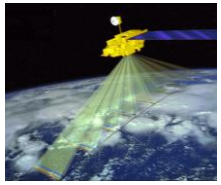
Missions – Meeting our commitments

JPL Earth Science Missions and Instruments

Operational



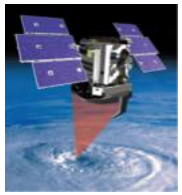
ASTER
(1999)



MISR
(1999)

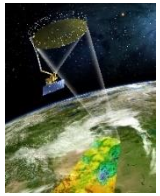
AIRS
(2002)

MLS
(2004)



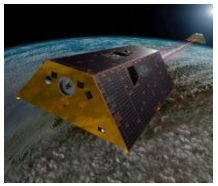
CloudSat
(2006)

Carbon Cycle: OCO-2
(2014)

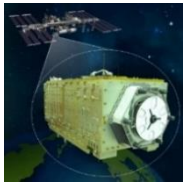


Soil Moisture: SMAP
(2015)

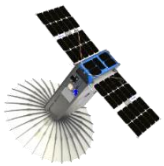
Jason 3[(1)] (2016)



GRACE-FO
(2018)

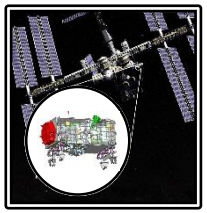


ECOSTRESS
(2018)

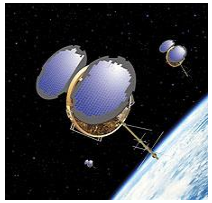


RaInCube
(2018)

TEMPEST-D
(2018)



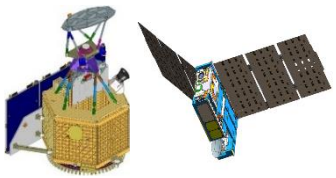
OCO-3
(2019)



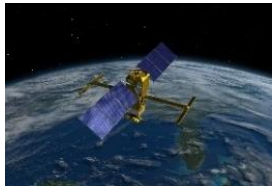
COSMIC-2 [(1)(2)]
(2019)

Formulation / Development

Sentinel-6A Michael Freilich
(2020)



Tempest D/COWVR[(2)]
(NET 2021)

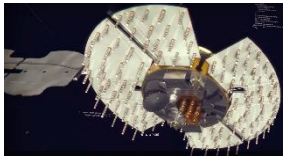


SWOT
(2021)

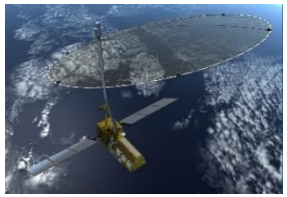
MAIA
(NLT 2022)

EMIT
(2022)

PREFIRE
(2022)



NTS-3[(2)]
(2022)



NISAR
(2022)

Sentinel-6B
(2025)

[(1)]NOAA [(2)]USAF

Sentinel-6 Michael Freilich

…preparing for Nov 10 launch!

JPL team remotely supported AIT in Germany

Satellite packed for Sept 23 shipment to VAFB

ESA/Airbus team has arrived at VAFB in Sept for launch Processing

Jason-CS/Sentinel-6B
2025

SWOT
2021

Jason-CS/Sentinel-6A
2020

Jason 3
2016

TOPEX/Poseidon
1992–2006

Jason 1
2001–2013

OSTM/Jason 2
2008

www.nasa.gov

Earth Systematic Missions (ESM) in Development

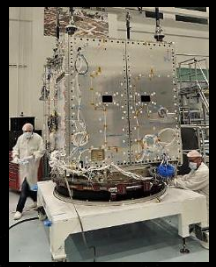
NISAR Dynamic Test Model (DTM) in 25’ Chamber

NISAR
NASA - ISRO SAR Mission

L-SAR MLI being installed for upcoming TVac test

DAA in 25’ Chamber

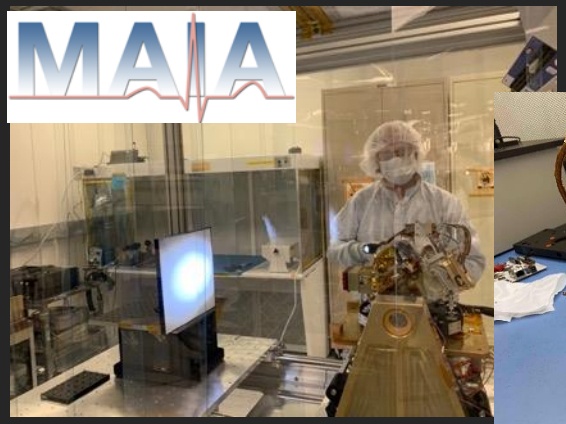
SWOT



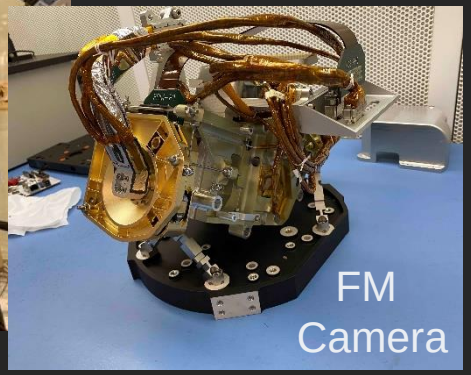
CNES S/C Bus Completed

KaRIn Module Ready for TVac Test in 10’ Chamber

Competed Missions (EVI's) In Development

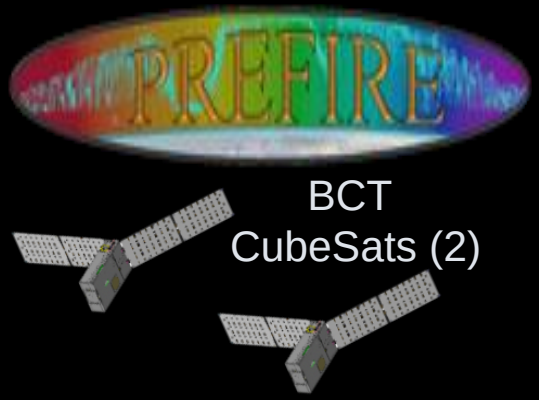


FM Camera First Light!



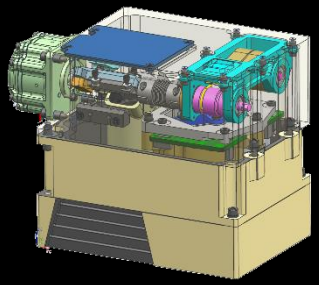
FM Camera

- **Completing subsystems and starting I&T**
- **Current instrument delivery ~Aug 2021**

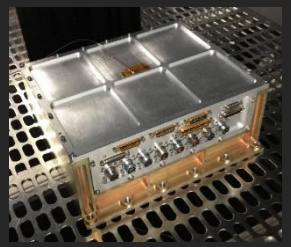


BCT CubeSats (2)

Thermal Infrared Spectrometer (TIRS)



Held successful PDR July 2020, KDP-C Sept 22



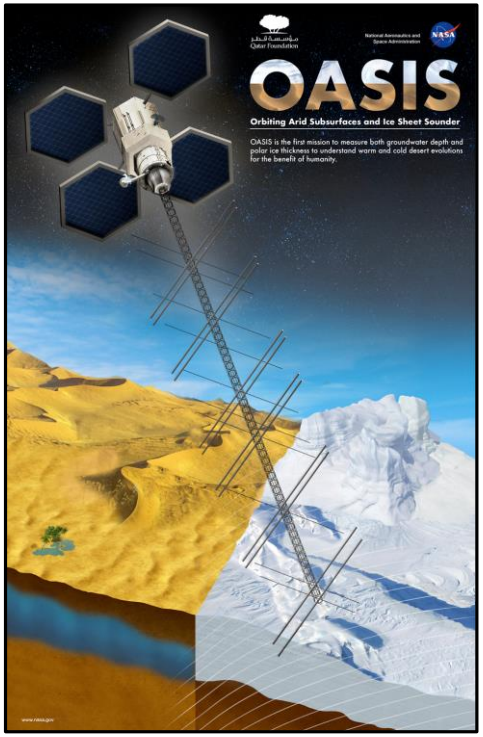
FM PCE - JPL

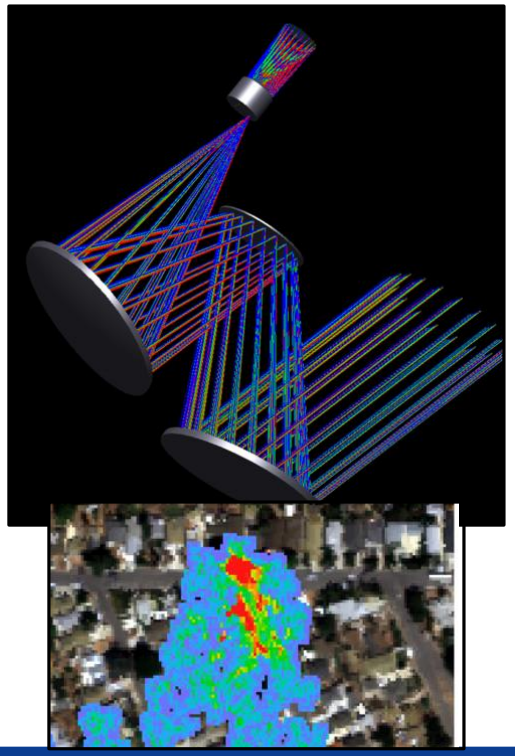
FM PCE

Prototype FPIE-D

Held successful CDR Aug 2020

NSTA Mission Activities for Earth Science

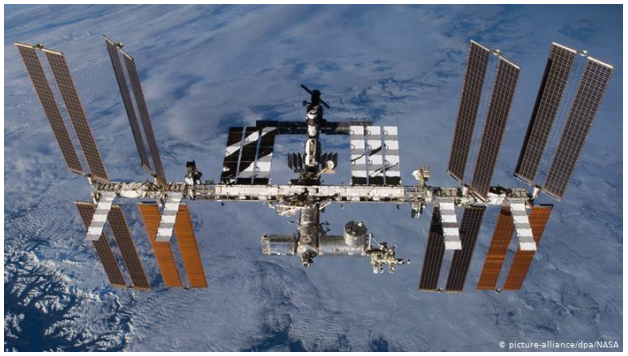




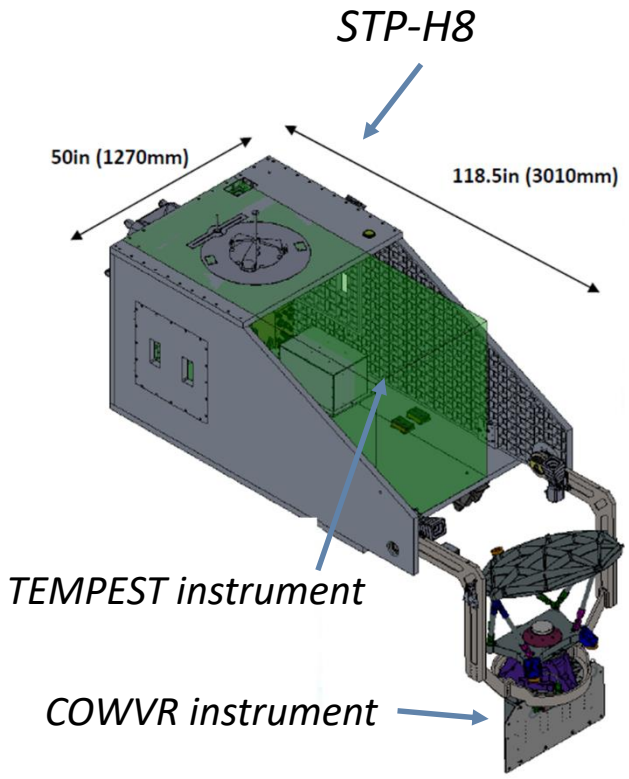
NTS-3	OASIS	Carbon Plume Mapper
GPS at GEO	Radar Sounder	Imaging Spectrometer
First GPS at GEO with autonomous orbit determination	First earth orbiting radar sounder for earth science	Lowest methane detection limit of any proposed mission
2022 Launch	Mission study funded	Sponsor secured funding

STP-H8 Mission: COWVR & TEMPEST

- Shannon Brown, JPL Principal Investigator
- Amarit Kitiyakara, JPL Task ManageR
- Randy Odle, JPL Program Office Contacts

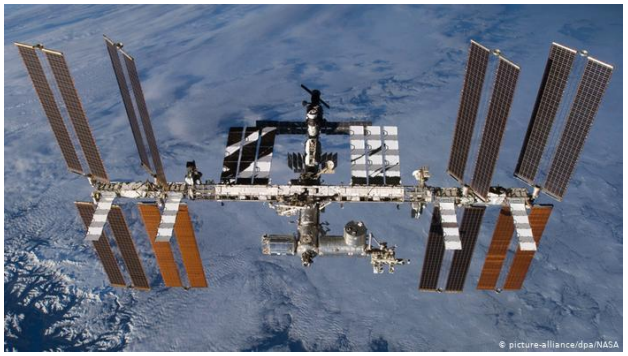


- Air Force mission to demonstrate new low-cost microwave sensor technologies for weather
  - COWVR: measures ocean surface wind vector
  - TEMPEST: measures water vapor, precipitation
- Deployment to ISS (JEM-EF module)
- DoD Space Test Program--Houston team is performing Mission Manager role
- **Launch in summer 2021**
- Operations: 2021-2024
- Science data processing at JPL
- Data will be distributed via PO.DAAC



STP-H8 Mission: COWVR & TEMPEST

- Shannon Brown, JPL Principal Investigator
- Amarit Kitiyakara, JPL Task ManageR
- Randy Odle, JPL Program Office Contacts



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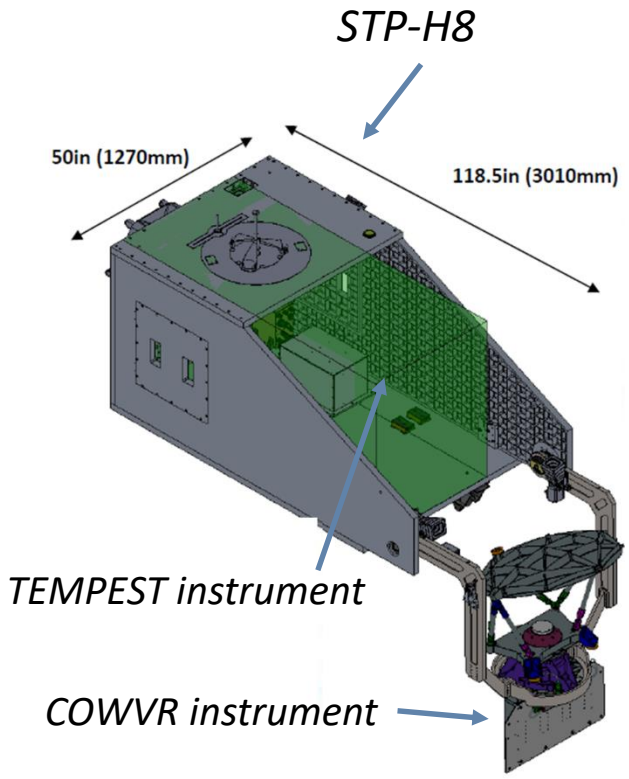
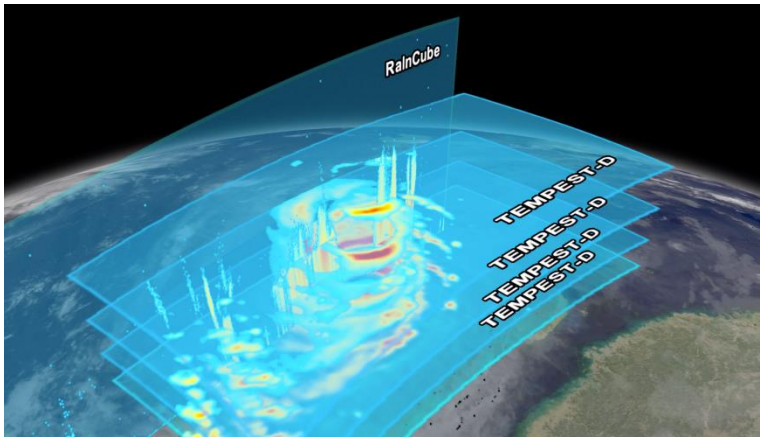
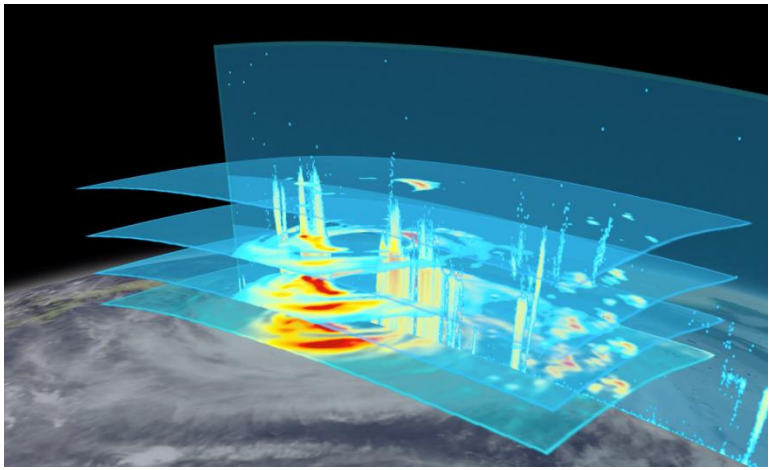


Planning underway to implement an internal JPL STP-H8 Science Working Group (SWG), with aspirations for HQ/NASA support and community inclusion.

RainCube/TEMPEST-D Have Their 2-Year Birthday





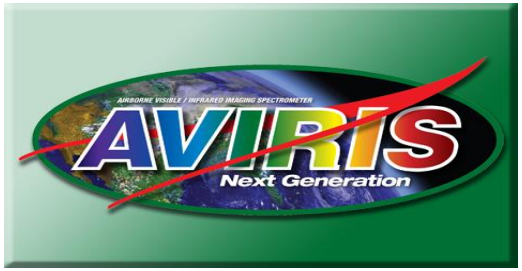
Lifetime
- 24 months in space (as of August 2020)
- Requirement: 3 months operation

Performance
- RainCube met GPM Ka-band radar sensitivity
- TEMPEST met operational sensor performance (GMI, MHS)

Challenges
- Raincube: NADIR pointing with 2 of 3 reaction wheels
- TEMPEST-D: addressed inconsistent data downlinking

Programmatic Value
- TEMPEST added to COWVR on STP-H8
- Risk reduction for DTRAIN and ACCP

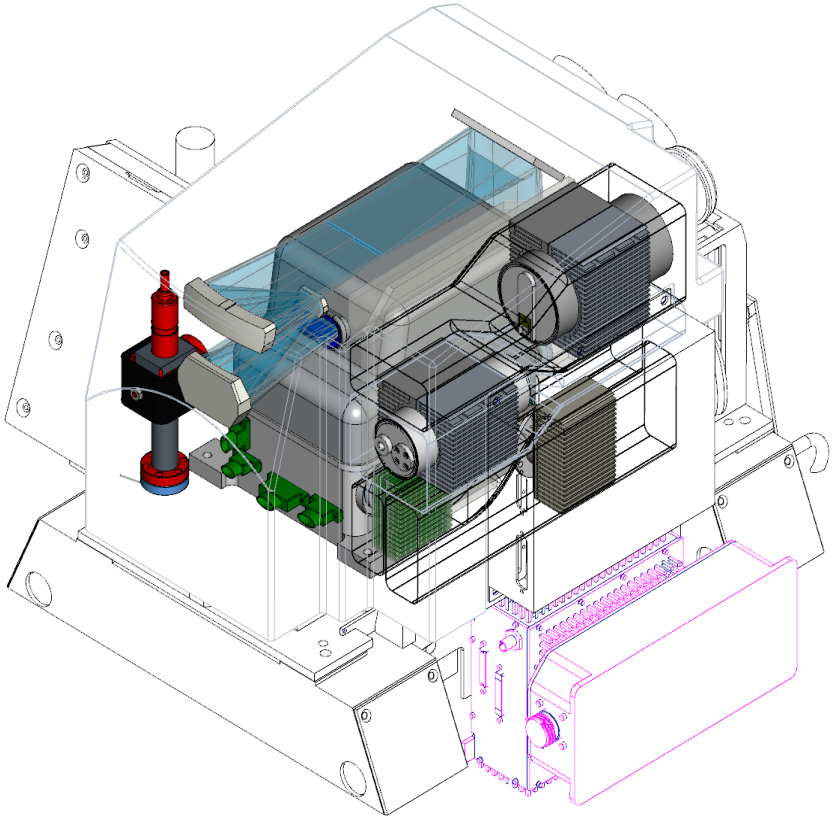
JPL Participation in 2020 Airborne Campaigns



Ultra-Compact Imaging Spectrometer – Airborne (UCIS-A)

- A VSWIR hyperspectral imaging (HSI) instrument *1/10th the volume of AVIRIS delivered in 2021.*

- JPL support DoD "transition to Industry" to deliver ~8 UCIS-A production units per approved JPL design



UCIS-A Instrument

Science & Technology Highlights

Some of the BIG Stories

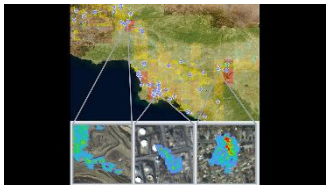
Journal Publications

September 2, 2020
A Machine-Learning Assist to Predicting Hurricane Intensity
(Su et al. Aug. 2020, Geophysical Research Letters)

August 21, 2020
NASA-led Study Reveals the Causes of Sea Level Rise Since 1900
(Frederikse et al. Aug. 2020, Nature)

August 20, 2020
Study: 2019 Sees Record Loss of Greenland Ice
(Sasgen et al. Aug. 2020, Communications Earth & Environment)

November 6, 2019
A Third of California Methane Traced to a Few Super-Emitters
(Duren et al. Nov. 2019, Nature)

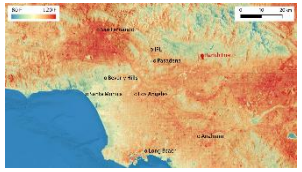


October 17, 2019
Caltech, NASA Find Web of Ruptures in Ridgecrest Quake
(Ross et al. Oct. 2019, Science)

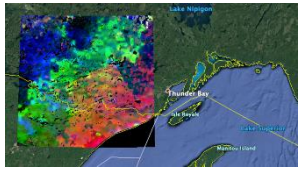
Some of the BIG Stories

Non-Journal Highlights

August 19, 2020
NASA's ECOSTRESS Monitors California's Record-Breaking Heat Wave
ECOSTRESS temperature map of Los Angeles during recent heat wave.

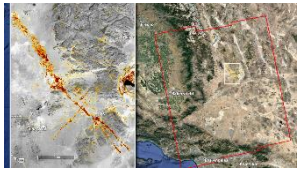


February 4, 2020
NASA's ECOSTRESS Mission Sees Plants 'Waking Up' From Space
ECOSTRESS image tracking start of evapotranspiration in plants.



September 3, 2019
NASA's ARIA Team Maps Flooding in the Bahamas
ARIA, etc. map flooding in the Bahamas from Hurricane Dorian.

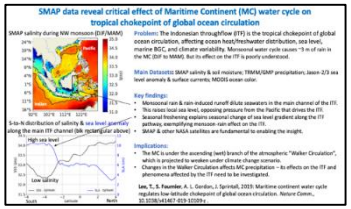
July 12, 2019
NASA's ARIA Team Maps California Quake Damage
ARIA damage map of Southern California after the Ridgecrest earthquake.
*This is related to the Science earthquake study noted in the previous slide.



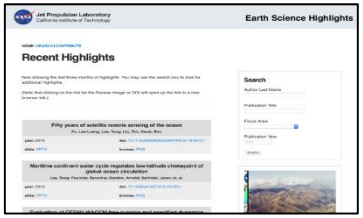
Disseminating Earth Science and Technology Peer-reviewed Publication Results to NASA

JPL PI/Scientist/Engineer with newly accepted, peer-reviewed, URS-approved paper

Make "Highlight Slide" *



Send to V. Zlotnicki to post on earth-highlights.jpl.nasa.gov



Automatic

Newsworthy Highlights

Jane Lee, Ian O'Neil, Esprit Smith

New – Public Friendly Highlight Timed with News Release

Mejs Hassan, Susan Callery

- **NASA ESD Leadership/Program Managers**
  (e.g. St. Germain, Cauffman, Kaye, Jucks, Lee, Lefer, Hibbard, etc.)

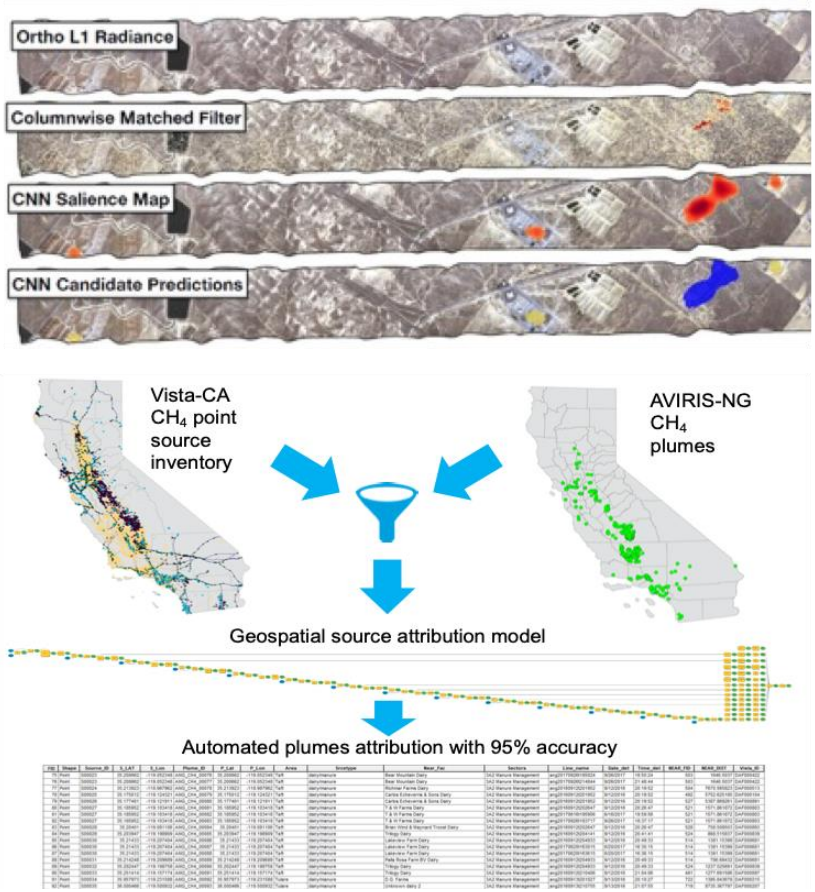
- **JPL**
  - News Team (Jane Lee, Ian O'Neil, Esprit Smith)
  - Lab Chief Scientist and Deputy Chief Scientist
  - 329 Section Mgrs & Group Sups
  - Other 3x Earth Science Related Mgrs (e.g. 334).
  - 830 Disciplinary Program Managers (**DPMs**)
  - Mission Project Scientists & Principal Investigators
  - 8x Senior Staff

First ones to follow this process:
Predicting Hurricane Intensity
Sea Level Rise Since 1900

Data Science for Earth Science

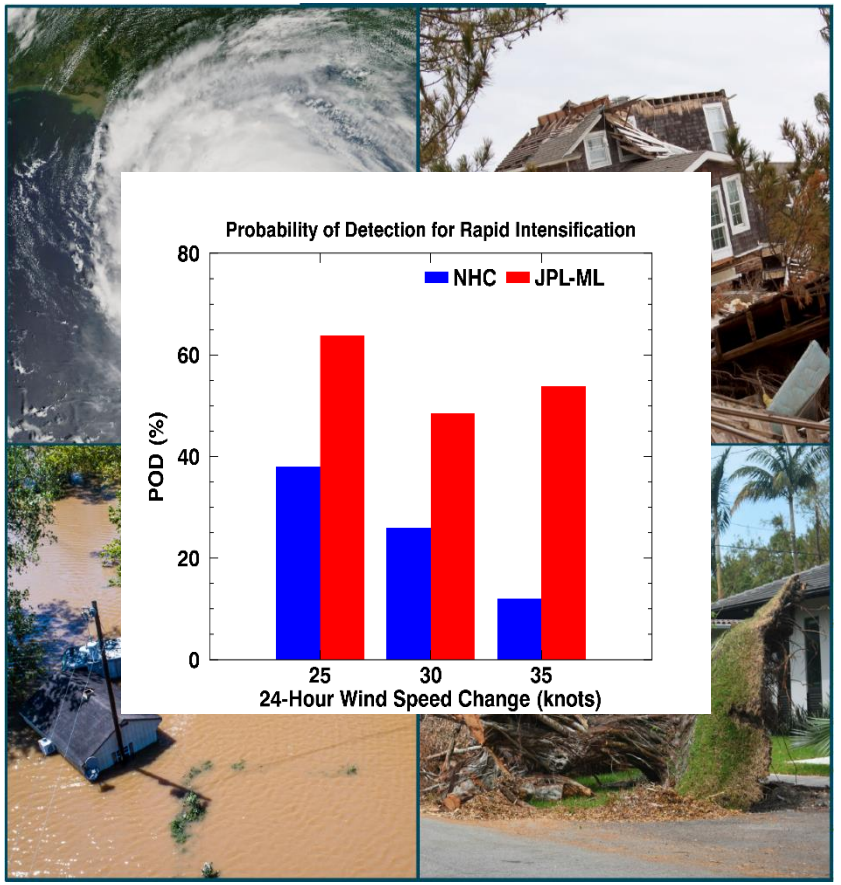
Deep Learning for Methane Point Source Detection

Reduced latency from 3 months to 48 hours



Machine Learning Assist to Predicting Hurricane Intensity

Improved forecasting in the Atlantic basin to >70%



ROSES Earth Science Calls due in the next ~ 3 months

A.x	PROGRAM	DUE DATE	HQ PE	DPM
A.18	Atmospheric Composition: Upper Atmospheric Composition Observations	09/17/20	Jucks	Jessica Neu
A.23	Atmospheric Composition: Campaign Data Analysis and Modeling	09/18/20	Eckman/ Lefer/ Maring	Jessica Neu
A.13	Ocean Salinity Field Campaign	09/24/20	Vinogradova-Shiffer	Victor Zlotnicki
A.14	Ocean Surface Topography Science Team	10/08/20	Vinogradova-Shiffer/ Leuliette	Victor Zlotnicki
A.6	Carbon Monitoring System	10/16/20	Jucks/ Hibbard/ Margolis/ Lorenzoni	Chip Miller
A.34	Studies with ICESat-2	10/30/20	Haffke/ Markus	Victor Zlotnicki
A.50	SAGE III/ ISS Science Team	11/06/20	Eckman	Jessica Neu
A.27	CYGNSS Competed Science Team	11/06/20	Skofronick-Jackson	Robert Ferraro
A.24	Terrestrial Hydrology	11/18/20	Entin	Son Nghiem
A.5	Carbon Cycle Science	12/03/20	Lorenzoni	Chip Miller
A.51	Science Team for the OCO Missions	01/13/21	Jucks	Chip Miller
A.45	In-space Validation of Earth Science Technologies	TBD	Babu	Jason Hyon
A.33	The Science of Terra, Aqua, and Suomi-NPP	TBD (Jan?)	Lefer	Jessica Neu

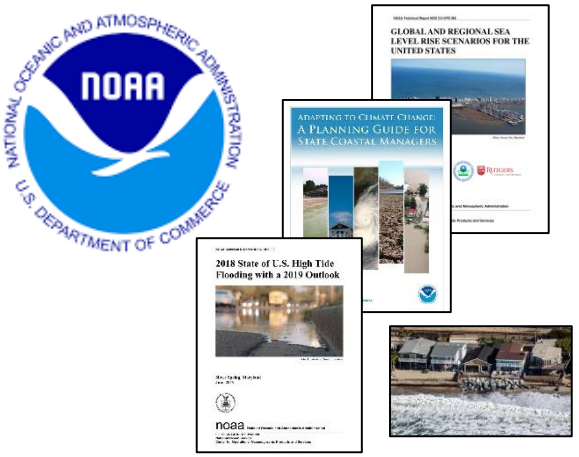
Amplifying Science for Societal Benefit

Architecting End-to-End Decision-Support Information Systems

Observations, Models and Sea Level Change Science Team

Decision Support for Coastal Hazard and Management

RISE – formulating a "Sea Level Guidance System" for improved coastal planning and management



GCE supported pre-formulation and partnership development activities for RISE in FY'19-20.
NASA ESD has agreed to support continued formulation and pilot development activities for RISE in FY'21.

ESTO Opportunities In FY21

- ESTO program elements: (Programs in "red" will be solicited in FY21)
  1. Instrument Incubator Program (IIP)
  2. *Advanced Component Technology (ACT) program*
     - *Develop new component- and subsystem-level measurement techniques*
  3. Advanced Information Systems Technology (AIST) program
     - Develop advanced information system technologies
  4. *Sustainable Land Imaging-Technology (SLIT)*
  5. In-space Validation of Earth Science Technologies (InVEST)
  6. Decadal survey incubator mission risk reduction

- One call for all 4 opportunities in October for concept down selection by 8X
  - A panel will allocate up to 6 concepts in each opportunity due to B&P budget

AIST-18 Awards ($1.2M PI, $300K – 500K CO-I)

	PI or Co-I	Title
JPL PI	Andrea Donnellan	Quakes-A: Quantifying Uncertainty and Kinematics of Earthquake Systems
	Riley Duren	Multi-Scale Methane Analytic Framework
	Hook Hua	Smart On-Demand Analysis of Multi-Temporal and Full Resolution SAR ARDs in Multi-Cloud & HPC
	Derek Posselt	A Science-Focused, Scalable, Flexible Instrument Simulation (OSSE) Toolkit for Mission Design
JPL Co-I	Natasha Stavros (PI: P. Townsend, UWisc)	On-Demand Geospatial Spectroscopy Processing Environment on the Cloud (GeoSPEC)
	Seungwon Lee (PI: J. Zhang, CMU)	Mining Chained Modules in Analytic Center Framework

IIP-19 Awards ($4.5M PI, up to $3M CO-I)

PI	Division	Proposal Title
Nathaniel Livesey	32	Continuity Microwave Limb Sounder (C-MLS)
Marco Lavalle	33	Distributed Aperture Radar Tomographic Sensors (DARTS) to Map Three-Dimensional Vegetation Structure and Surface Topography
Raquel Rodriguez Monje	33	CloudCube
Simon Yueh	32	Signals of Opportunity Synthetic Aperture Radar for High Resolution Remote Sensing of Land Surfaces
Adrian Tang (Lead Co-I)	38	Digitally Enhanced Meta-surface Radar/Radiometer for Snow Remote Sensing
Javier Bosch-Lluis (Lead Co-I)	38	Smart Ice Cloud Sensing
Bill Klipstein (Lead Co-I)	33	Integrated Inertial Sensors and Laser Ranging Instruments for Small Satellite Earth Geodesy Constellations

AITT-19 (Airborne Instrument) Awards ($1.5M PI)

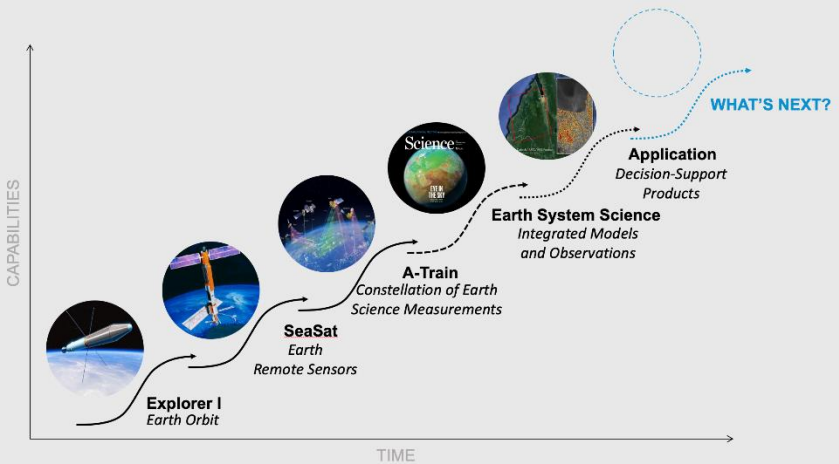
PI	Division	Proposal Title
Ken Cooper	38	Upgrading VIPR for Routine Pressurized Aircraft Deployment in Science Field Campaigns
Nathaniel Livesey	32	The Airborne Scanning Microwave Limb Sounder (A-SMLS)
Andrea Donnellan	32	Quantifying Uncertainty and Kinematics of Earth Systems Imager (QUAKES I)

SLIT-19 (Sustaining Land Imaging Technology) Awards ($1.2M)

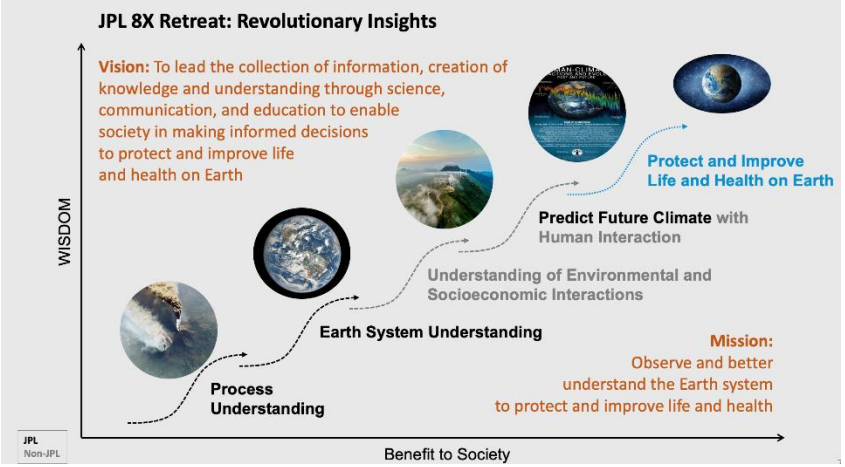
PI	Division	Proposal Title
David Ting	38	Versatile Computational Pixel Infrared Land Imager

8X JNEXT Transformational Concept Development

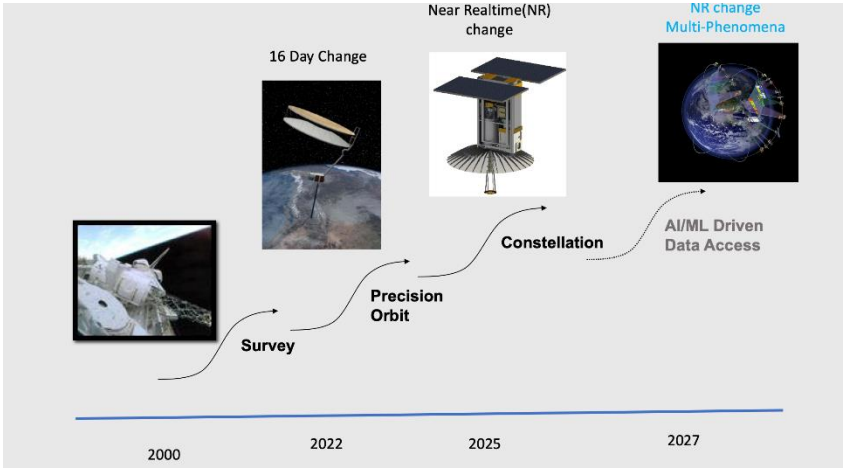
Example 1



Example 2



Example 3



1. Concepts were due September 15th
2. A panel will assist PI's to mature transformation concepts
3. 8X will down select 3 concepts in preparation for JNEXT call in November
4. JNEXT will fund up to 12 concepts at $250K at the first step

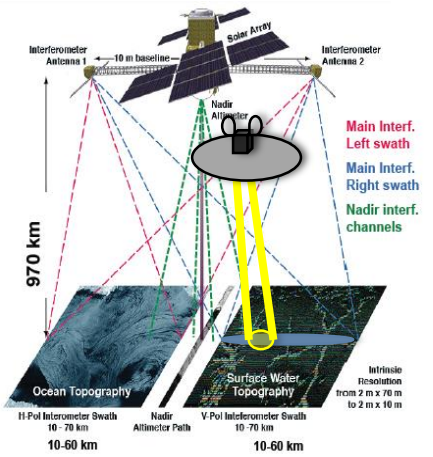
Strategic RTD - Technology

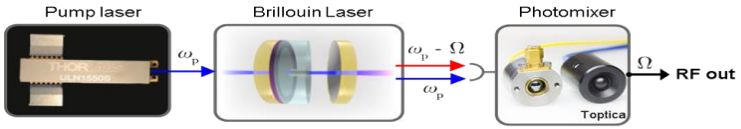
- **Decadal Survey Instruments**
  - Polarimetric Imager and FTS for air pollution
  - Ka band hybrid radar and radiometer instrument
  - CloudCube airborne demonstration

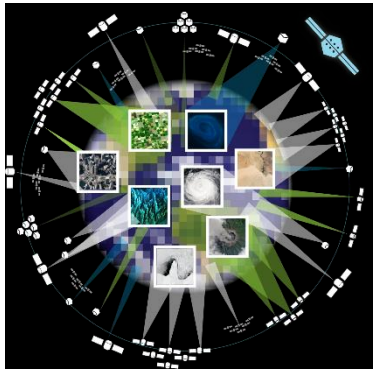
- **Radars 2050**
  - VHF – Ka distributed radars for Ice sounding and STV
  - THz disruptive new designs for PBL

- **HotBIRD** 1K x 1K digital ROIC detector

- **POISE** (Planned Observation and Intelligent Science Experiment)
  - AI/ML applied forecast model improvement based on autonomous data acquisition from distributed space assets







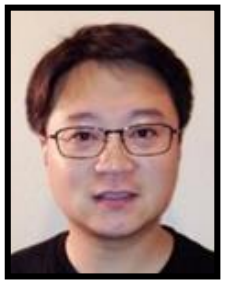
FY'21 Strategic RTD – Science

- **Earth 2050** (Yr 2)
  - Greenland contribution to sea level by 2050 - Seroussi et al.
  - Southern Ocean carbon cycle in 2050 - Menemenlis et al.
- Satellite-constrained land model for the **CliMA** (Yr 2) - Bloom & Worden
- A Golden Era for **Hydrology** from Space – (Yr 2) *1 of 2 Hires* - David, Search Comm
- **Planetary Boundary Layer** – DS Challenge – (Yr 3) - Teixeira et al.
- **Linkages in the Earth System** (*Small rollover into* Yr 4)
  - Ocean and hydrology coupling - Lee
  - Developing solid earth – hydrosphere modeling capability - Lundgren
  - Air quality research and model development - Jiang
- **Center for Climate Science** - Stephens & Teixeira

New Scientists and Technologists in the Earth Science Section

Fernando Chouza Keil
Research Scientist
Group 329H – *Laboratory Studies and Atmospheric Observations*
Near-ground ozone and aerosol lidar measurements for air quality studies and model evaluation

Jacola Roman
Research Technologist
Group 329E – *Atmospheric Physics and Weather*
IR water vapor retrievals, validation and assessment techniques, and the application of observations for weather and climate analytics.



Tao Wang
Research Technologist
Group 329E – *Atmospheric Physics and Weather*
Understanding the behavior of cloud, water vapor, and trace gases using multi-sensor satellite observations

Heidar Thrastarson
Research Technologist
Group 329E – *Atmospheric Physics and Weather*
Planetary atmospheres, ranging from extrasolar planets to the Earth, using both Climate Models and satellite data.

Renato Prata de Moraes Frasson
Research Scientist
Group 329F – *Terrestrial Hydrology*
River networks using satellite imagery and wide swath altimetry

Kimberley Miner (TMS)
Research Scientist
Group 329G – *Carbon Cycle and Ecosystems*
Climate scientist with a focus on risk assessment and systems dynamics

Lambert Caron
Research Scientist
Group 329C – *Sea Level and Ice*
Ice and solid-Earth interactions, sea level projections, mantle rheology and uncertainty quantification

Frank Winiberg
Research Scientist
Group 329H – *Laboratory Studies and Atmospheric Observations*
Chemical kinetics and chemical mechanisms, laboratory studies of chemistry of upper troposphere/ lower stratosphere.

Richard Roy
Research Technologist
Group 329J – *Aerosols and Clouds*
Ground-based, airborne, and spaceborne remote sensing of clouds, precipitation, and water vapor.

Maria Hakuba
Research Scientist
Group 329J – *Aerosols and Clouds*
Earth's energy and sea level budgets, assessments of Earth's energy imbalance, climate feedbacks, and satellite measurements of radiation flux

Center for Climate Sciences

Upcoming Lectures

CCS Friday Seminar Series Schedule

DATE	NAME	AFFILIATION	TOPIC	RECORDED WEB LINK
9/18/2020	Casey Wall	UCSD	The Life Cycle of Tropical Anvil Clouds	
11/13/2020	Sammie Buzzard	Georgia Tech	TBD	

CCS Distinguished Climate Lectures Schedule

DATE	NAME	AFFILIATION	TOPIC	RECORDED WEB LINK
October, TBD	Steven Rutledge	UCLA	Atmospheric Electricity, Lightning and Convection	
November, TBD	Carol Anne Clayson	Woods Hole Oceanographic Institution	PBL, Air-sea interaction	
December, TBD	Andrea Molod	NASA	GMAO seasonal prediction	
January, TBD	Britton Stephens	NOAA	TBD	
Feburary, TBD	Rong Fu	UCLA	Atmospheric dynamics, land-atmosphere interaction, climate models	
March, TBD	Michael Depledge	UK Met Offce	TBD	

Aerosol and Cloud, Convection and Precipitation (ACCP) Webinar Series

DATE	NAME	AFFILIATION	TOPIC	RECORDED WEB LINK
9/14/2020	Kerry Emanuel	MIT	Severe convective storms: present and future	https://jpl.webex.com/recordingservice/sites/jpl/recording/playback/7e85f831ddea46339ac18f958e1513b7
9/28/2020	Andreas Prein	NCAR	Towards Global Convection-Permitting Earth System Modeling	

Awards and Honors

Early Career Achievements

Rashmi Shah (335A)

IEEE GRSS (Geoscience and Remote Sensing Society) Early Career Award

For pioneering work in the development of Signals of Opportunity (SoOp) methods in oceanographic and hydrologic remote sensing.

Sona Hosseini (3224)

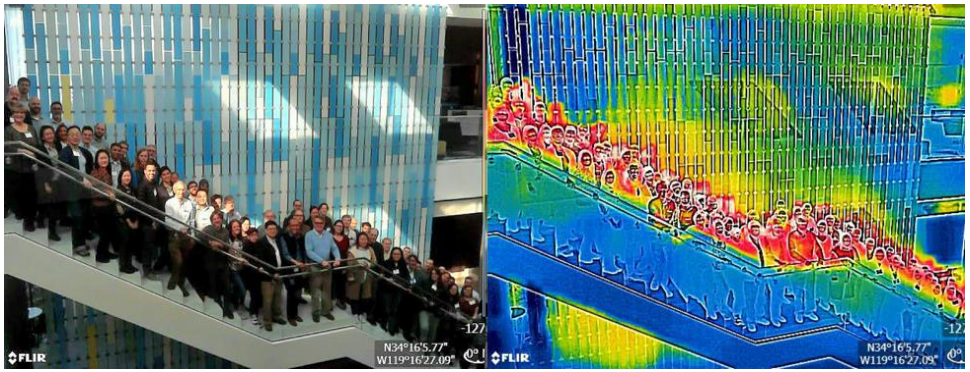
SPIE Early Career Achievement Award

One of two 2020 recipients of the SPIE Early Career Achievement Award - Industry/Government focus - in recognition of her innovative optical design work on ultra-miniature heterodyne spectrometers.

Rotary Honors

Annmarie Eldering (3290)

2020 Humanitarian Star Award for Environmental Improvement

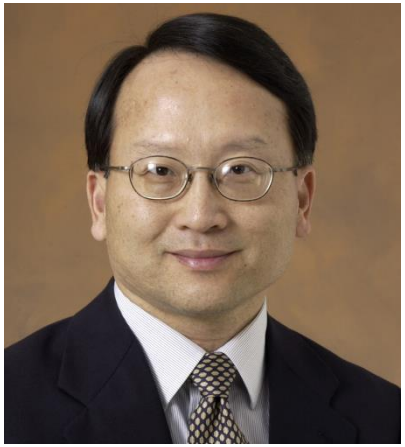


ECOSTRESS Team

Nominated for 2020 Rotary National Award for Space Achievement Foundation's Stellar Award

Winners will be announced Nov 2020

New Fellows



Lee Fu (3200)
2019: American Association for the Advancement of Science (AAAS)

Son Nghiem (3340)

2019: American Geophysical Union (AGU)

Earth Science Post Doc Poster Awards

Earth Science A - Emphasis on: Water, Land, Biome, Carbon Cycle
Jose Társilo Girona Hernandez (Org 329A)
Advisor: Vincent Realmuto
Poster Title: Diffuse Heating of Volcanic Mountains Prior to Eruption

Earth Science B - Emphasis on: Ocean, Ice, Atmosphere, Climate
Amaury Dehecq (Org 329C)
Advisor: Alex Gardner
Poster Title: Towards an improved estimate of mountain glaciers contribution to sea level rise since 1975

Ed Stone Award

Tony Lee (329B)

For elucidating the role of the Maritime Continent's water cycle on the global ocean circulation.

Lew Allen Award

Marco Lavalle (334H)

For sustained leadership in creating and advancing new Earth-science applications of Interferometric Synthetic Aperture Radar.

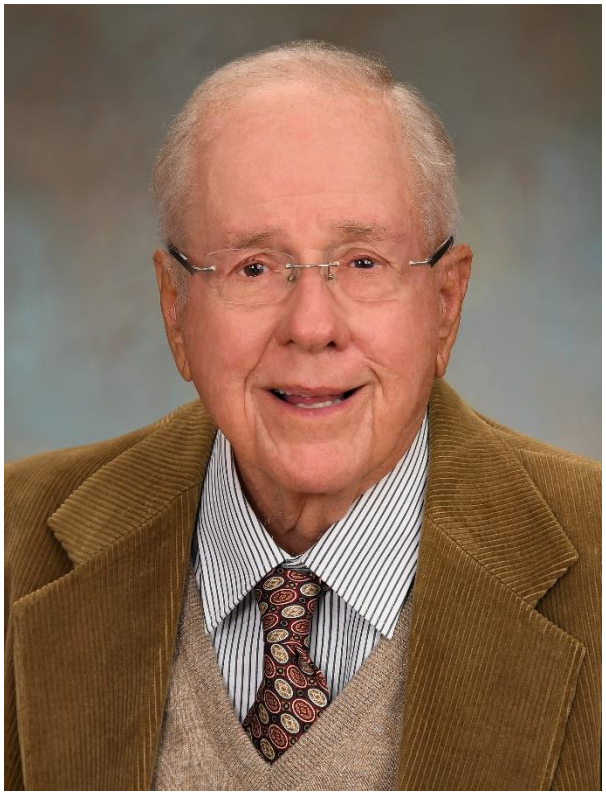
Charles Elachi Award

Surendra Adhikari (329A)

Early Career Achievement: For providing new insights into the interactions between ice mass transport and the solid Earth.

2019 Haagen-Smit Award Winner

California Air Resources Board



William B. DeMore

"The elder statesman of atmospheric chemistry, Dr. DeMore's lifetime contributions to the measurement and modeling of atmospheric ozone cannot be overstated. His comprehensive knowledge of chemical kinetics and cool-headed scientific diplomacy were vital to the resolution of many important problems in analytical chemistry with high stakes for air quality management. He is being honored in the category of Research."

Looking Ahead

Earth Venture Mission - 3 (EVM-3)

- PI led complete spaceflight mission investigations
- PI-Managed Mission Cost
  - $190M FY22, A-F
  - Included in that cap are access to space options
    - $61M (Pegasus class)
    - $22M (Venture Class)
    - $6.5 M/$4.2 M per ESPA Grande/ESPA port
    - PI-arranged Access to Space option
- Launch
  - 5 years from initiation of Phase A contract
- AO Release date
  - Originally expected Fall 2019
  - Current estimate is NET October, 2020
  - 90-day response period
- Future Earth Venture opportunities, including EVI-6 and EVS-4, will be delayed to avoid overlap with EVM-3

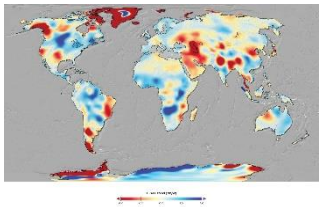
EVM-3 Community Announcement (CA) Summary

Item	Draft AO	CA	Comment
Alternative Access to Space	Not allowed	Allowed	
Venture Class Launch Services (VCLS)	$25 M, <150 kg, <500 km Sun-sync	$22 M, >150 kg, >500 km $12 M, <150 kg, <500 km	No mention of Sun-sync constraint in CA
Rideshare	$25 M per rideshare, ESPA Grand or ESPA	$6.5 M per ESPA Grande port $4.2 M per ESPA port $25 M full ESPA Grande/ESPA	
Level 1 and Level 2 Science Requirements	Required in proposal	Not required in proposal	May be included in the proposal, but no additional page count

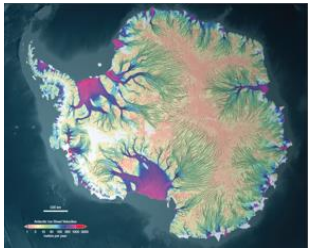
2017 Decadal Survey Progress Highlights

- DS identified 5 Designated Observables for mandatory acquisition
- Four multi-center Designated Observables architecture studies initiated in 2018
  - Three of the four studies led by JPL
- Study teams have been
  - Evaluating architectures
  - Engaging with their communities
  - Developing enabling partnerships
- ESD budget
  - Fully funds a DO project to be initiated in FY21 through the budget window
  - Initiates two more DO missions in FY22 and FY25
- Expect SBG to be the first to start in FY21 with MC starting in FY 22

Surface Biology & Geology (SBG)
- Led by JPL
- Down select briefing with ESD held July 29, 2020
- Pre-Phase-A start expected in early FY21
- Launch in 2026



Mass Change (MC)
- Led by JPL
- Down select briefing with ESD October 2020 (TBC)
- Pre-Phase-A start expected in FY21 or FY22
- Launch in 2027-2030



Surface Deformation & Change (SDC)
- Led by JPL
- Down select briefing with ESD post 2023
- Pre-Phase-A start expected in FY21 or FY22
- Launch in 2028-2032

Combined: Aerosols-Clouds, Convection & Precipitation (ACCP)
- Led by GSFC with contributions from JPL
- Down select briefing with ESD January 2021 (TBC)
- Pre-Phase-A start expected in FY22 or FY25
- Launch in 2028 and 2029

Decadal Survey Incubation Study Teams:
Planetary Boundary Layer (PBL) and Surface Topography and Vegetation (STV)

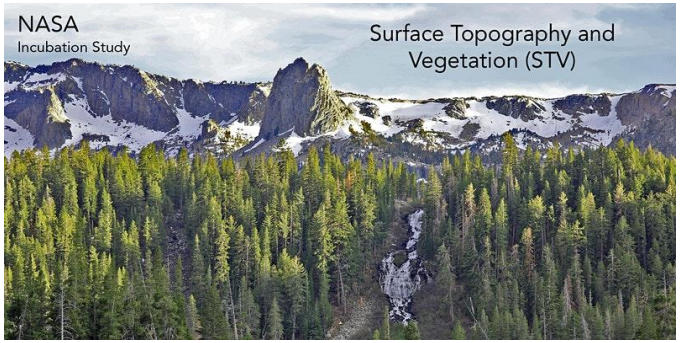
One year study to gather perspectives, define the technological state-of-the-art, and define potential activities related to advancing PBL and STV Targeted Observables objectives as outlined in the 2017 decadal survey. JPL team members selected:

Planetary Boundary Layer (PBL)

Joao Teixeira - Study Team Lead
Chi Ao
Matt Lebsock

Surface Topography and Vegetation (STV)

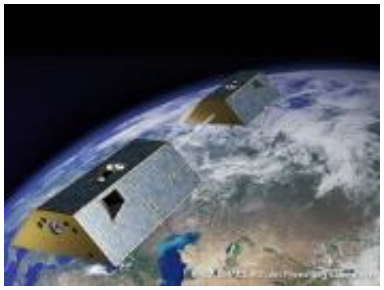
Andrea Donnellan - Study Team Lead
Paul Lundgren
Cathleen Jones
Alex Gardner
Robert Treuhaft
Marco Lavalle
Yunling Lou
Mark Simard
Sassan Saatchi



What we were thinking then…

… Highlights from 2012 Retreat

- **Prepare for Earth Ventures opportunities** → ECOSTRESS, TEMPEST, MAIA, EMIT, PREFIRE
- **Invest in Hydrology area** → Multiple hires, WSWM
- **Establish a DPM role for Applied Sciences** → Sharon Kedar
- **Prepare for the 2017 Decadal Survey** → SBG, ACCP, MC, SDC
- **Mobilize for successful missions** → SMAP, OCO-2, GRACE-FO, NISAR, and SWOT
- **Exploit ISS** → OCO-3, ECOSTRESS
- **Develop SLR capability**→ RISE with NOAA



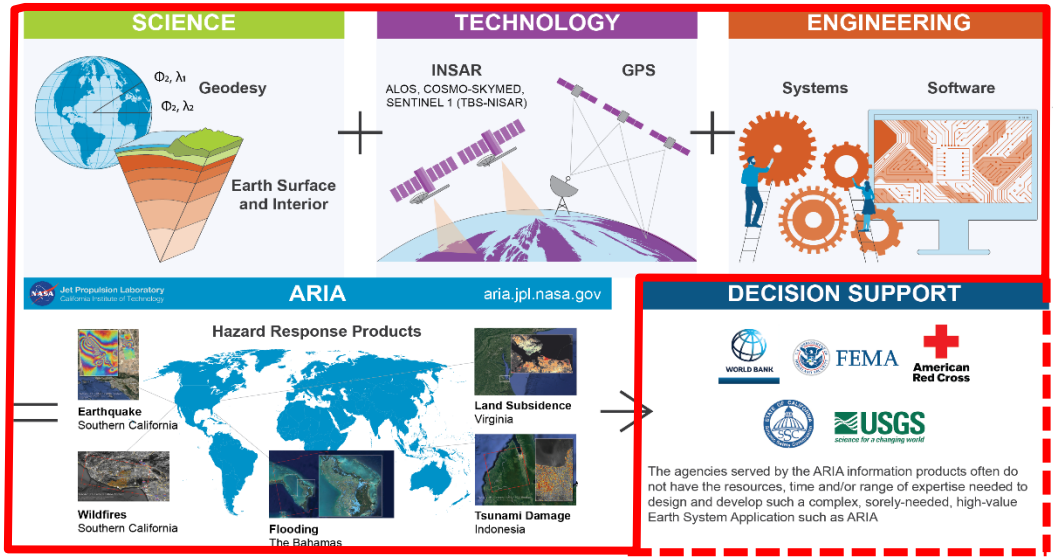
What we're thinking now…

…Highlights from 2020 Retreat

- Looking at a longer term horizon (10-20 year) driven by
  - Lower-cost access to space
  - Rising commercial data sources
  - Advances in analytic technologies
  - Push for tangible societal benefits
- Looking ahead from JPL's strongest foundations
  - Revolutionary Insights
  - Accelerating Science and Technology
  - Innovative Engineering for Missions
  - Important Data and Information
  - Inspired Storytelling

What we'll do next…

…Outcomes from 2020 Retreat



- Build a foundation for JPL's next decade
  - Pursue end to end, system engineered, information systems
  - Develop revolutionary capabilities and tools for info systems
  - Nurture needed cross-disciplinary skills within the workforce
- Share the JPL experience with our stakeholders
  - Develop an intentional communication strategy for key audiences
  - Infuse good storytelling in our communication products

Summary

Despite COVID impacts, you have had one heck of a year in FY'20.

- Space and airborne missions are pushing ahead with confidence
- Lots of new NASA and non NASA sponsored opportunities
- Robust technology and science programs.

Looking toward the future – not just accomplishing missions but deriving societal benefits from future efforts.

- Growing ES system engineering
- Focusing on applications to complement science
- Improving our story telling and reaching a great audience