



2018 AGU Fall Meeting Schedule of Events at the NASA Booth #1034



NASA Science welcomes you to Washington, DC—our Nation's capital! We hope that you have a monumental science experience during your visit. Join us at the *Hyperwall* for science stories, take NASA's Anniversary Challenge at the *Stepping Through Moments in NASA History* exhibit, and make new science connections while strolling down Avenues Interconnected, Impact, Innovation, and Inspiration.

Learn something new, have fun, and discover together!

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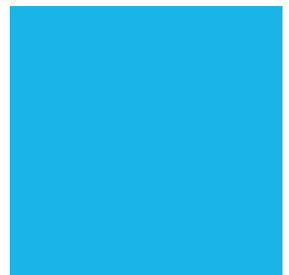
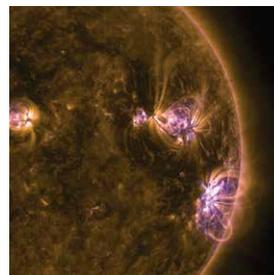
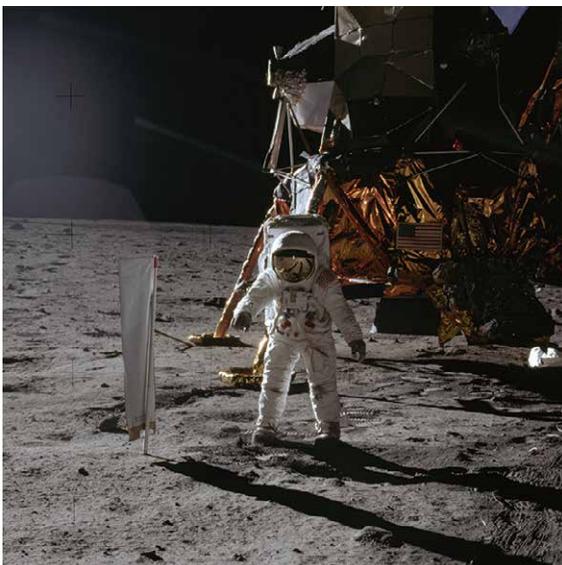


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L E G E N D	HYPERWALL PRESENTATIONS (15 minute talks at Hyperwall)
	FLASH TALKS (7 minute talks at Hyperwall)
	LIVE DEMONSTRATIONS (located at Live Demo)
	VIRTUAL REALITY DEMONSTRATIONS (located at Virtual Reality Demo)
	2018 WINNERS OF THE AGU DATA VISUALIZATION AND STORYTELLING COMPETITION (located at Hyperwall)

MONDAY, DECEMBER 10, 2018

TIME	HYPERWALL PRESENTATIONS	PRESENTER
6:05 - 6:10 PM	Opening Remarks from NASA's Science Mission Directorate	Dennis Andrucyk
6:10 - 6:25 PM	NASA's Earth Observation Capabilities: Meeting the Challenges of Climate and Environmental Change	Michael Freilich
6:25 - 6:40 PM	Sailing Through Space: A Heliophysics Odyssey	Alex Young
6:40 - 6:55 PM	The Role of Small Bodies in Our Solar System	Lori Glaze
6:55 - 7:10 PM	NASA's Astrophysics Journey	Paul Hertz
7:10 - 7:25 PM	NASA's Joint Agency Satellite Division	John Lee
7:25 - 7:40 PM	NASA's Exploration Campaign	Steve Clarke
7:40 - 7:55 PM	Space Directive-1: Moon Now, Mars Next	James Green

LIVE DEMONSTRATIONS		
6:00 - 8:00 PM	Subsetting and Visualizing NASA's MODIS and VIIRS Land Products with the Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC) Tools Suite	Rupesh Shrestha
VIRTUAL REALITY DEMONSTRATIONS		
6:00 - 8:00 PM	Flooded! Exploring NASA Disaster Applications Data and Catastrophic Flooding with Virtual Reality	Shayna Skolnik

TUESDAY, DECEMBER 11, 2018

TIME	HYPERWALL PRESENTATIONS	PRESENTER
10:05 - 10:15 AM	In Search of an Ozone Recovery	Richard Eckman
10:15 - 10:30 AM	ECOSTRESS: Earth Science and Applications from the ISS	Joshua Fisher
10:30 - 10:45 AM	Measuring Atmospheric Carbon Dioxide with the NASA Orbiting Carbon Observatory-2 (OCO-2)	David Crisp
10:45 - 11:00 AM	Mars InSight	Renee Weber
11:00 - 11:15 AM	The Changing Arctic: What Does it Mean for Us?	Patrick Taylor
11:15 - 11:30 AM	NISAR: Science Benefiting Society	Cathleen Jones
11:30 - 11:45 AM	NASA Heliophysics	Nicola Fox
2018 WINNERS OF THE AGU DATA VISUALIZATION AND STORYTELLING COMPETITION		
12:00 - 1:15 PM	Visual and Sonic Representation of Hurricane Data: Sounds of Hurricanes	Owen Evans
	Peering Inside: Using Serial Sectioning and Machine Learning to Reconstruct the First Biomineralizing Organisms	Akshay Mehra
	Worldview Augmented Reality: A Case Study on the Implications of Mixed Reality for Earth Science Data Visualization	Jack Miller
	Earth Observations and Conservation: Protecting the Amazon with Imagery	Alison Thieme
FLASH TALKS		
1:20 - 1:27 PM	Beyond the Edge of the Solar System	Eric Christian
1:30 - 1:37 PM	The SNOPI CubeSat: SigNals of Opportunity P-band Investigation	James Garrison
1:40 - 1:47 PM	Better Landslide Prediction Begins with You: Learn How to Become a Landslide Citizen Scientist Today!	Dalia Kirschbaum
1:50 - 1:57 PM	Martian Exploration Zones: Sites for Future Human and Robotic Missions	Brian Day / Emily Law
2:00 - 2:07 PM	POWER UP! Making NASA Data Available for Energy-Related Societal Benefits	Paul Stackhouse
2:10 - 2:17 PM	NASA's STEM Innovation Lab: Explore, Create, Share	Troy Cline
2:20 - 2:27 PM	Swift's Eyes on Comets	Dennis Bodewits
2:30 - 2:37 PM	Application of ISS Lightning Data to Improve Hazardous Weather Preparation	Leigh Sinclair
2:40 - 2:47 PM	Experience the World's Largest Hackathon: The NASA International Space Apps Challenge!	Patricia Jacobberger / Sarah Hemmings
2:50 - 2:57 PM	Nearly 4 Decades After the Last Lander: Enduring Mysteries of Venus's Surface	Jeff Balcerski
HYPERWALL PRESENTATIONS		
3:15 - 3:30 PM	Prototype Methane Monitoring System for California	Riley Duren
3:30 - 3:45 PM	Arctic-Boreal Vulnerability Experiment	Peter Griffith
3:45 - 4:00 PM	Simulating Martian Weather and Climate with the NASA Ames Mars Global Climate Model	Alex Kling / Melinda Kahre
4:00 - 4:15 PM	The 2018 Long Island Sound Tropospheric Ozone Study	Laura Judd / Jim Crawford / Jay Al-Saadi
4:15 - 4:30 PM	Apollo 50 th Anniversary	Ryan Zeigler
4:30 - 4:45 PM	From the Surface to the Sky: Snow Science at Goddard and Beyond	Ian Adams
4:45 - 5:00 PM	Solar System Science with JWST	Stefanie Milam
5:00 - 5:15 PM	Exoplanet Transit Surveys are Dead; Long Live Exoplanet Transit Surveys	David Ciardi
5:15 - 5:30 PM	NASA's Europa Clipper Mission: Exploring a Potentially Habitable World	Steve Vance
LIVE DEMONSTRATIONS		
10:00 - 11:00 AM	An Overview of FIRMS, the Fire Information for Resource Management System that Provides Satellite-Derived Near Real-Time Fire Information to Users Around the World	Diane Davies
11:00 - 12:00 PM	Solar System Treks: Interactive Visualization and Analysis Tools Enabling Mission Planning, Scientific Research, Education, and Public Outreach	Emily Law
12:00 - 2:00 PM	Visit the International Space Station, Home to the SAGE III Instrument	Marilee Roell / Allison Leybold
2:00 - 3:00 PM	Hot & sPyC: Enabling Software Developers to Target Heterogeneous On-board Computing Accelerators	Matthew French
3:00 - 4:00 PM	Power to Explore	Kristin Spear
4:00 - 5:30 PM	What Color is the Ocean?	Heather Hanson
VIRTUAL REALITY DEMONSTRATIONS		
10:00 - 2:30 PM	Science Data Visualizations in Augmented Reality (AR)/Virtual Reality (VR) for Planetary and Earth Science	Thomas Grubb
2:30 - 5:30 PM	Virtual Reality Tool for Earth Science Data	Joe Roberts

WEDNESDAY, DECEMBER 12, 2018

TIME	HYPERWALL PRESENTATIONS	PRESENTER
10:05 - 10:15 AM	Life and Climate on Mars: Past, Present, and Future	Bruce Jakosky
10:15 - 10:30 AM	Listening for Quakes and Volcanoes from Balloons on Venus	Siddharth Krishnamoorthy
10:30 - 10:45 AM	The NASA PACE Mission: Status, Science, Advances	Jeremy Werdell
10:45 - 11:00 AM	Export Processes in the Ocean from Remote Sensing (EXPORTS)	Paula Bontempi / Ivona Cetinic
11:00 - 11:15 AM	All in the NAAMES of Ocean Ecosystems and Climate	Rich Moore
11:15 - 11:30 AM	Earth Observations Applied to a Changing World: NASA Health and Air Quality Applications	John Haynes
11:30 - 11:45 AM	A Tree Census From Polar-Orbit	Compton Tucker
2018 WINNERS OF THE AGU DATA VISUALIZATION AND STORYTELLING COMPETITION		
12:00 - 1:00 PM	Seeing the Forest Through the Data Cube	Megan Link
	Geospatial Energy Potential and Life Cycle Assessment of Nearshore Oscillating Water Column Systems Along the Eastern Coast of New England, United States	Aleks Siemenn
	Visualizing the Largest Deep-Ocean Silicic Eruption Ever Recorded	Meghan Jones
FLASH TALKS		
1:20 - 1:27 PM	Data Tips: Learn how to Discover, Access, and Analyze NASA Goddard Earth Sciences Data and Information Services Center (GES DISC) Data	Jennifer Wei
1:30 - 1:37 PM	Land Cover Across the GLOBE	Peder Nelson
1:40 - 1:47 PM	Many Eyes on the Sun: Solar Orbiter	Teresa Nieves-Chinchilla
1:50 - 1:57 PM	Exploring Ceres and Vesta with the Dawn Mission and the Solar System Trek Portals	Brian Day / Emily Law
2:00 - 2:07 PM	Photonic Integrated Circuits: Enabling Sensors in Space on Small Platforms	Jonathan Klamkin
2:10 - 2:17 PM	Accessing 46 Years of Landsat Data	Linda Owen
2:20 - 2:27 PM	Earth Observatory for Kids	Tassia Owen
2:30 - 2:37 PM	The HARP Polarimeter Family: A Round Trip from Large Satellites to CubeSats and Back	Vanderlei Martins
2:40 - 2:47 PM	The GeoCarb Mission: Observing the Carbon Cycle from Geostationary Orbit	Sean Crowell
2:50 - 2:57 PM	Discover the NASA Astrophysics Data System's New Search Platform	Alberto Accomazzi
HYPERWALL PRESENTATIONS		
3:00 - 3:15 PM	Exploring Mars	Elizabeth Rampe
3:15 - 3:30 PM	Global Gas Flaring Monitoring with VIIRS in 2012-2018	Mikhail Zhizhin
3:30 - 3:45 PM	Kilauea Eruption and Disaster Response	Jean-Paul Vernier / John Murray
3:45 - 4:00 PM	From Space to Society: Applied Sciences at NASA Goddard	Stephanie Schollaert Uz
4:00 - 4:15 PM	High-Flying Interns: 10 Years of the NASA Student Airborne Research Program	Emily Schaller
4:15 - 4:30 PM	Exploring Lava Flows on Iceland and the Moon	Jacob Richardson
4:30 - 4:45 PM	Searching for Other Worlds	Giada Arney
4:45 - 5:00 PM	Mapping Methane Plumes with AVIRIS-NG	Andrew Thorpe
5:00 - 5:15 PM	Clouds and Radiation from CERES/CALIPSO	Sergio Sejas / Norman Loeb
5:15 - 5:30 PM	Astronaut Geoscience Training	Jacob Bleacher
LIVE DEMONSTRATIONS		
10:00 - 11:00 AM	Spectral Measurements: The World's Fingerprints	Michael Taylor
11:00 - 12:00 PM	Explore Our Dynamic Planet with NASA Worldview!	Minnie Wong
12:00 - 2:00 PM	Visit the International Space Station, Home to the SAGE III Instrument	Marilee Roell / Allison Leybold
2:00 - 3:00 PM	An Overview of FIRMS, the Fire Information for Resource Management System that Provides Satellite-Derived Near Real-Time Fire Information to Users Around the World	Diane Davies
3:00 - 4:00 PM	NASA Physical Oceanography Distributed Active Archive Center (PO.DAAC)	Ed Armstrong
4:00 - 5:30 PM	NeMO-Net Interactive Learning Application	Alan Li / Ved Chirayath
VIRTUAL REALITY DEMONSTRATIONS		
10:00 - 12:00 PM	Flooded! Exploring NASA Disaster Applications Data and Catastrophic Flooding with Virtual Reality	Shayna Skolnik
12:00 - 3:00 PM	Science Data Visualizations in Augmented Reality (AR)/Virtual Reality (VR) for Planetary and Earth Science	Thomas Grubb
3:00 - 5:30 PM	Virtual Reality Tool for Earth Science Data	Joe Roberts

THURSDAY, DECEMBER 13, 2018

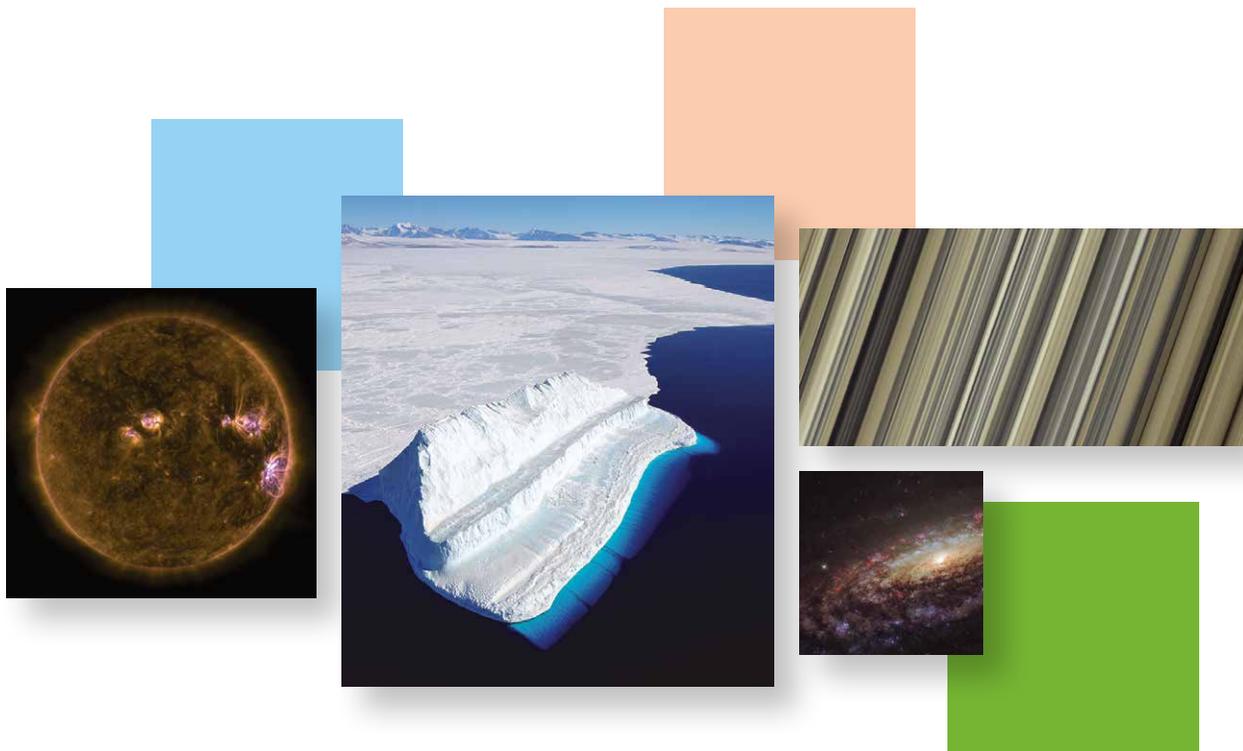
TIME	HYPERWALL PRESENTATIONS	PRESENTER
10:05 - 10:15 AM	Next Generation Communications Capabilities	Phil Liebrecht
10:15 - 10:30 AM	Viewing the Earth From Space	Jack Kaye
10:30 - 10:45 AM	Earth Science Data System Program: Preparing for the Data Deluge	Kevin Murphy
10:45 - 11:00 AM	ICESat-2: First Looks at On-Orbit Data	Nathan Kurtz
11:00 - 11:15 AM	NASA Disasters Program: From Response to Resilience in Areas of Risk	David Green
11:15 - 11:30 AM	A Multi-Sensor Remote Sensing Approach to Predict Cholera	Rita Colwell
11:30 - 11:45 AM	Science from Across and Beyond the Solar System	Joseph Lazio
11:45 - 12:00 PM	Moon Rocks in 3D	Andi Thomas
12:00 - 12:15 PM	JWST's Breakthrough Studies of Planet Formation	Jonathan Lunine
12:15 - 12:30 PM	TRAPPIST-1 and Other Amazing Exoplanet Tales from Spitzer Beyond	Sean Carey
12:30 - 12:45 PM	Bringing Jupiter's Hazes into Focus with JunoCam	Glenn Orton
12:45 - 1:00 PM	Exploring Landsat Analysis Ready Data	Christopher Barnes
FLASH TALKS		
1:00 - 1:07 PM	Taking the Earth's Temperature: The InVEST HyTI Mission	Robert Wright
1:10 - 1:17 PM	Quantifying the Meteorological Effects of the 2017 Great American Solar Eclipse Using Citizen Scientist Observations	Brant Dodson
1:20 - 1:27 PM	A Good Question Might be the Answer	Jenna Giddens
1:30 - 1:37 PM	Canopy to Coral: Monitoring Forest Change and Watershed Health in the Osa Peninsula, Costa Rica	Suravi Shrestha
1:40 - 1:47 PM	Summer in the City: Assessing the Urban Heat Island in Washoe County, NV	Mariah Heck
1:50 - 1:57 PM	Introducing the Computational Reconfigurable Imaging Spectrometer (CRISP)	Adam Milstein
2:00 - 2:07 PM	Discover and Access International Space Station (ISS) ECOSTRESS & GEDI Data	Sydney Neeley
2:10 - 2:17 PM	Panopoly: A Super-Easy, Cross-Platform Tool for Viewing Earth Observation Data and Models	Christopher Lynnes
2:20 - 2:27 PM	Airborne Data Visualizer: Explore Data from the NASA Earth Venture Suborbital Program	Jack McNelis
2:30 - 2:37 PM	Citizen Science Data for Earth System Science	Holli Kohl
2:40 - 2:47 PM	Buildings, Borders, and 'Burbs': Mapping Our Human Planet	Robert Chen
HYPERWALL PRESENTATIONS		
3:00 - 3:15 PM	Lunar Landing Sites: Past and Future	Brian Day
3:15 - 3:30 PM	NASA's Eyes: 3D Solar System Simulation in Real-Time	Jason Craig
3:30 - 3:45 PM	Harvest Data for Informed Agricultural Decisions	Inbal Becker-Reshef
3:45 - 4:00 PM	Terrestrial Gamma-Ray Flashes: Gamma-Rays from Thunderstorms	Michael Briggs
4:00 - 4:15 PM	Global Precipitation Measurements for Science and Society	Gail Skofronick-Jackson
4:15 - 4:30 PM	Natural and Human Impacts on Coastal Ecosystems	David Lagomasino
4:30 - 4:45 PM	GLOBE Mission Mosquito Citizen Science Campaign	Russanne Low
4:45 - 5:00 PM	American Museum of Natural History OpenSpace Project	Carter Emmart
5:00 - 5:15 PM	High-Resolution GEOS Simulations	Steven Pawson
5:15 - 5:30 PM	Dynamic Global Fire Connections	Amber Soja
LIVE DEMONSTRATIONS		
10:00 - 11:00 AM	Spectral Measurements: The World's Fingerprints	Michael Taylor
11:00 - 12:00 PM	Visualize and Access NASA Biogeochemical and Ecological Data Through the Spatial Data Access Tool	Yaxing Wei
12:00 - 1:00 PM	Hot & sPyC: Enabling Software Developers to Target Heterogeneous On-board Computing Accelerators	Matthew French
1:00 - 2:00 PM	Using NASA's AppEEARS to Access Geospatial Data	Sydney Neeley
2:00 - 3:00 PM	NASA PO.DAAC State Of The Ocean: I Spy with My Little Eye, Something...	Jessica Hausman
3:00 - 4:00 PM	NASA Physical Oceanography Distributed Active Archive Center (PO.DAAC)	Ed Armstrong
4:00 - 5:30 PM	NeMO-Net Interactive Learning Application	Alan Li / Ved Chirayath
VIRTUAL REALITY DEMONSTRATIONS		
10:00 - 1:00 PM	James Webb Space Telescope in Virtual Reality	Alexandra Lockwood
1:00 - 3:00 PM	Flooded! Exploring NASA Disaster Applications Data and Catastrophic Flooding with Virtual Reality	Shayna Skolnik
3:00 - 5:30 PM	Science Data Visualizations in Augmented Reality (AR)/Virtual Reality (VR) for Planetary and Earth Science	Thomas Grubb

FRIDAY, DECEMBER 14, 2018

TIME	HYPERWALL PRESENTATIONS	PRESENTER
9:45 - 10:00 AM	NASA Water Resources Program	Christine Lee
10:00 - 10:15 AM	Peru's Shrinking Tropical Ice Caps	Christopher Shuman
10:15 - 10:30 AM	Parker Solar Probe	Aleida Higginson
10:30 - 10:45 AM	CSI Apollo: Recreating Earthrise	Ernie Wright
10:45 - 11:00 AM	Discovering Innovative and Practical Uses of Earth Observations	Lawrence Friedl

LIVE DEMONSTRATIONS		
9:30 - 10:30 AM	Solar System Treks: Interactive Visualization and Analysis Tools Enabling Mission Planning, Scientific Research, Education, and Public Outreach	Emily Law
10:30 - 1:30 PM	Laser Communications in Space: An Accessible Demo Kit for Public Outreach	James Acevedo

VIRTUAL REALITY DEMONSTRATIONS		
9:30 - 5:30 PM	James Webb Space Telescope in Virtual Reality	Alexandra Lockwood



Detailed Descriptions of Flash Talks

Time/Title	Description	Presenter
Tuesday, December 11		
1:20 - 1:27 PM Beyond the Edge of the Solar System	Right now, the two Voyager spacecraft are exploring the edge of our solar system and beyond. The Interstellar Boundary Explorer (IBEX) is also studying this interaction between the heliosphere and the galaxy, but from orbit around the Earth. The boundary between the solar system and interstellar space is a lot more complicated than we ever imagined. Learn about some of the discoveries from these missions and what NASA has planned for the future.	Eric Christian Heliophysicist, NASA Goddard Space Flight Center (GSFC)
1:30 - 1:37 PM The SNoOPI CubeSat: SigNals of Opportunity P-band Investigation	The SigNals of Opportunity P-band Investigation (SNoOPI) will be the first on-orbit demonstration of P-band (240-380 MHz) reflectometry, testing a new capability to sense root-zone soil moisture (RZSM) and snow water equivalent (SWE), priority variables identified in the Decadal Survey for Earth Science and Applications from Space (ESAS 2017). P-band is necessary to penetrate dense vegetation into the root zone and to reduce phase unwrapping in SWE retrieval. Reflectometry improved on conventional microwave techniques which are prone to RFI, have limited allocations, and require large antennas.	James Garrison Professor, Purdue University
1:40 - 1:47 PM Better Landslide Prediction Begins with You: Learn How to Become a Landslide Citizen Scientist Today!	NASA scientists are building an open global inventory of landslides, and we need your help! Knowing where and when landslides occur can help communities worldwide prepare for these disasters. Satellite data are being used to model landslide processes globally, but having high quality information on the distribution and patterns in landslide activity is vital to advancing this effort. NASA has recently launched the citizen scientist project "Landslide Reporter" and we encourage you to participate and help inform decisions that could save lives and property today. Visit our site at: https://landslides.nasa.gov to learn more.	Dalia Kirschbaum Research Scientist, Principal Investigator of Landslide Reporter Citizen Science Project
1:50 - 1:57 PM Martian Exploration Zones - Sites for Future Human and Robotic Missions	NASA and its partners have identified a list of candidate landing site "Exploration Zones" for future crewed and robotic missions to Mars. Learn how to use NASA's Mars Trek portals to conduct your own explorations of these areas and find out what makes them so fascinating.	Brian Day Solar System Treks Project Manager, Science Lead, NASA Solar System Treks Portal (SSTP), NASA Solar System Exploration Research Virtual Institute (SSERVI) Emily Law Solar System Treks Project Manager, Engineering Lead, NASA Jet Propulsion Laboratory (JPL)
2:00 - 2:07 PM POWER UP! Making NASA Data Available for Energy-Related Societal Benefits	This talk presents a brief overview and demonstration of the newly released NASA POWER (Prediction of Worldwide Energy Resource) GIS-enabled web services (https://power.larc.nasa.gov). The web portal provides access to a large number of solar energy and surface meteorological data parameters from the past 30+ years up to a few days behind real time. Available data products are adapted from GEWEX SRB, CERES FLASHFlux, and MERRA-2 and have been customized for the renewable energy (including solar energy) and building energy efficiency user communities.	Paul Stackhouse Senior Research Scientist, NASA Langley Research Center

Detailed Descriptions of Flash Talks

Time/Title	Description	Presenter
2:10 - 2:17 PM NASA's STEM Innovation Lab: Explore, Create, Share	<p>NASA's STEM Innovation Lab is a think tank with an emphasis on space science content applications. It brings together NASA scientists, engineers, and educators to explore and develop new ideas related to infusion of educational technology into STEM (Science, Technology, Engineering, and Mathematics) activities, programs, and approaches. Inside the lab are a variety of interchangeable STEM exploration stations fitted with technologies typically found in many of today's 21st century educational environments. Ideas generated in the lab are captured, collected, and shared with educators, educational technology researchers, and space enthusiasts around the world. So if you're looking for new and inspired ways to make use of technology in your educational setting with open access to NASA content, then you've come to the right place.</p>	Troy Cline STEM Innovation Lab Lead, NASA GSFC, Heliophysics
2:20 - 2:27 PM Swift's Eyes on Comets	<p>Designed as an observatory to investigate cosmic explosions, Swift has turned out to be a very effective comet hunter. It has investigated a collision between two asteroids, examined whether a comet on a close encounter with Mars posed any risk to NASA's orbiters, and discovered a record-breaking slowdown in the rotation of a nearby comet.</p>	Dennis Bodewits Associate Professor, Auburn University
2:30 - 2:37 PM Application of ISS Lightning Data to Improve Hazardous Weather Preparation	<p>In February 2017, the Lightning Imaging Sensor (LIS) was launched and installed on the International Space Station (ISS). The ISS LIS provides observations of global lightning flashes, including data at higher latitudes than previously possible. These datasets at the NASA Global Hydrology Resource Center (GHRC) Distributed Active Archive Center (DAAC) allow for the study of lightning in hazardous weather events over much of Earth for applied science research. This talk will provide an overview of the data available, including examples of how they are used for applied science research.</p>	Leigh Sinclair Research Scientist, NASA GHRC DAAC
2:40 - 2:47 PM Experience the World's Largest Hackathon: The NASA International Space Apps Challenge!	<p>Space Apps is an international hackathon that occurs over 48 hours in cities around the world simultaneously. Coders, scientists, designers, storytellers, makers, builders, technologists, and people enthusiastic about problem-solving collaborate to address challenges we face on Earth and in space. Approximately 18,000 people registered for Space Apps 2018, and 200 events were held across 75 countries. We're excited to continue the tradition of inviting students and professionals, beginners and experts from all corners of the globe to join in!</p>	Patricia Jacobberger Senior Advisor, Earth Science Division, NASA Headquarters Sarah Hemmings Earth Science Policy and Program Analyst, (Booz-Allen Hamilton), Earth Science Division, NASA Headquarters
2:50 - 2:57 PM Nearly 4 Decades After the Last Lander: Enduring Mysteries of Venus's Surface	<p>Robotic spacecraft last visited the surface of Venus in 1985 and the thick atmosphere limits orbital observations. Many of the mysteries uncovered three decades ago remain unresolved, but recent technological development can enable a new era of exploration of Earth's closest and most enigmatic neighbor.</p>	Jeff Balcerski Senior Researcher, Ohio Aerospace Institute / NASA Glenn Research Center

Detailed Descriptions of Flash Talks (cont.)

Time/Title	Description	Presenter
Wednesday, December 12		
1:20 - 1:27 PM Data Tips: Learn how to Discover, Access and Analyze NASA Goddard Earth Sciences Data and Information Services Center (GES DISC) Data	<p>At the NASA Goddard Earth Sciences Data and Information Services (GES DISC), we strive to simplify data discovery and data access to our wide range of global climate data, concentrated primarily in the areas of atmospheric composition, atmospheric dynamics, global precipitation, solar irradiance, and several modeling data sets related to land surface hydrology. To help meet user needs, we will demonstrate how you can use the GES DISC knowledge-base resources (HowTo's) and we also encourage community contributions.</p>	Jennifer Wei Science Lead, NASA GES DISC
1:30 - 1:37 PM Land Cover Across the GLOBE	<p>The <i>Land Cover- Adopt a Pixel</i> is the latest protocol for the GLOBE Observer app and is one more way for citizen scientists to help update land cover maps which are critical to many different processes on Earth and contributes to a community's vulnerability to disasters like fire, floods or landslides. Join us as we provide an overview of the science and showcase the results of the first 3 months of land cover photos, classifications, and maps submitted by citizen scientists recording observations using the GLOBE Observer mobile app's new Land Cover tool.</p>	Peder Nelson Science Lead, Land Cover Protocol- GLOBE Observer; Instructor of Geography & Geospatial Science, Oregon State University
1:40 - 1:47 PM Many Eyes on the Sun- Solar Orbiter	<p>We live in the extended atmosphere of the Sun--the heliosphere-- a giant bubble of magnetized plasma that envelops the solar system and defines the boundary with our galaxy. How the Sun creates and controls this space is a central question for Heliophysics. To address this question, Solar Orbiter will combine a highly inclined orbit (~30° above the ecliptic) with closest approach to the Sun of 0.28 AU. The mission will image the Sun in a variety of wavelengths, and it will measure the solar wind plasma, fields, waves, and energetic particles. Solar Orbiter is a joint collaboration between the European Space Agency (ESA) and NASA that that is currently scheduled for launch in early 2020 and will help us better understand the star we live with.</p>	Teresa Nieves-Chinchilla Research Scientist, NASA Project Scientist Team, Heliophysics Science Division, NASA GSFC, Catholic University of America (CUA)
1:50 - 1:57 PM Exploring Ceres and Vesta with the Dawn Mission and the Solar System Trek Portals	<p>Exceptional vistas of spectacular terrains on Ceres and Vesta have been explored by NASA's Dawn Mission. The new Ceres Trek Portal and an updated Vesta Trek Portal allow users of all ages to interactively explore mysterious ice volcanoes, scenes of titanic impacts, and more!</p>	Brian Day Solar System Treks Project Manager, Science Lead, NASA Solar System Treks Portal (SSTP), NASA Solar System Exploration Research Virtual Institute (SSERVI) Emily Law Solar System Treks Project Manager, Engineering Lead, NASA Jet Propulsion Laboratory (JPL)
2:00 - 2:07 PM Photonic Integrated Circuits: Enabling Sensors in Space on Small Platforms	<p>Photonic integrated circuits miniaturize photonic systems in the same way that integrated circuits miniaturized computers. This technology is primed to enable photonic sensors and optical communications on SmallSats and other small platforms for rapid and low-cost deployment.</p>	Jonathan Klamkin Associate Professor of Electrical and Computer Engineering University of California Santa Barbara

Detailed Descriptions of Flash Talks

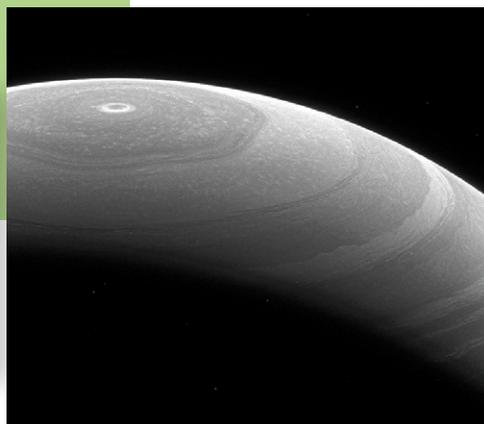
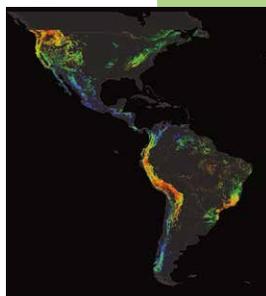
Time/Title	Description	Presenter
2:10 - 2:17 PM Accessing 46 Years of Landsat Data	<p>The joint NASA-USGS Landsat program has collected and archived over 8 million scenes since Landsat 1 was launched in 1972. Recent improvements to the quality and usability of the USGS Landsat archive have been made with the release of a collection-based inventory structure, Landsat Analysis Ready Data, and advanced Landsat Science Products. This presentation will illustrate how to discover and download these new data products to help understand landscape change.</p>	Linda Owen Landsat Science Communications Specialist SGT/USGS EROS
2:20 - 2:27 PM Earth Observatory for Kids	<p><i>Earth Observatory for Kids</i> is a free printable PDF available for download from the NASA Earth Observatory website (https://earthobservatory.nasa.gov). The goal of the publication is to increase Earth science communication with a younger audience (ages 9 - 14) through engaging articles and activities. Science enthusiasm starts young and we are inviting kids to explore our Earth with us and NASA.</p>	Tassia Owen EO Kids Manager, NASA GSFC
2:30 - 2:37 PM The HARP Polarimeter Family - A Round Trip from Large Satellites to CubeSats and Back	<p>The HARP hyper-angular imaging polarimeter concept was initially designed aiming the next generation of Large Earth Science Satellites to measure aerosol and cloud properties and their interactions in Earth's atmosphere. The miniaturization of the concept to a 1.5U CubeSat form factor has ultimately reduced its cost and risk, and made it feasible for a wide range of applications from Smallsats to large platforms. As part of this evolution, the HARP system has been demonstrated in aircraft platforms, is slotted to fly in a 3U Cubesat in 2019 and has joined the NASA PACE mission to fly in 2021 providing two-day global coverage.</p>	Vanderlei Martins Professor of Physics, University of Maryland Baltimore County
2:40 - 2:47 PM The GeoCarb Mission: Observing the Carbon Cycle from Geostationary Orbit	<p>GeoCarb will make observations of carbon dioxide, methane, and carbon monoxide from geostationary orbit. With daily mapping-like coverage, these observations will revolutionize our understanding of the carbon cycle.</p>	Sean Crowell Project Scientist, Geocarb, University of Oklahoma
2:50 - 2:57 PM Discover the NASA Astrophysics Data System's New Search Platform	<p>The new Astrophysics Data System (ADS) interface has been the official face of the Astrophysics Data System for nearly a year. While it supports the same types of searches that could be done in the Classic system, it's also capable of a whole lot more. This talk will provide a brief overview of the new system and highlight some of its more advanced features such as full-text search and network visualizations.</p>	Alberto Accomazzi Principle Investigator, NASA ADS

Detailed Descriptions of Flash Talks (cont.)

Time/Title	Description	Presenter
Thursday, December 13		
1:00 - 1:07 PM Taking the Earth's Temperature: The InVEST HyTI Mission	The InVEST HyTI mission will acquire high spectral resolution thermal infrared data to study Earth surface and atmospheric processes, for applications as diverse as agriculture and volcanic eruption monitoring. The instrument, a Fabry-Perot imaging interferometer, will allow both the temperature and the chemical composition of the targets to be determined. It will fly on board a 6U CubeSat, on which a powerful computer will process the data, and generate science data products in real time.	Robert Wright Interim Director, Hawaii Institute of Geophysics and Planetology, University of Hawaii at Manoa
1:10 - 1:17 PM Quantifying the Meteorological Effects of the 2017 Great American Solar Eclipse Using Citizen Scientist Observations	GLOBE Observer is a citizen science program of 100,000 contributors whose data complements conventional ground stations and satellites. Observers collected over 20,000 cloud and 80,000 temperature measurements during the 2017 Great American Solar Eclipse. A methodology for analyzing large volume, limited quality-controlled crowdsourced data was developed to quantify the cloud-temperature relationship. Topics at work include contrails, ground-truthing of satellite data, and surface observations over Antarctica.	Brant Dodson Research Scientist, NASA LaRC, SSAI
1:20 - 1:27 PM A Good Question Might be the Answer	Social science research has repeatedly demonstrated that more facts rarely (if ever) change minds. Once formed, opinions are persistent. While subject matter experts see gaps between what people believe about the world and what science tells us, the believer does not. Since there is no gap, more information, especially contradictory information, is simply ignored. Shifting from persuasion to conversation, however, presents an opportunity to plant seeds of mutual understanding. Learning to ask good questions might be the answer.	Jenna Giddens Co-Lead for Earth to Sky Interagency Partnership
1:30 - 1:37 PM Canopy to Coral: Monitoring Forest Change and Watershed Health in the Osa Peninsula, Costa Rica	The Osa Peninsula, located in the southern region of Costa Rica, is one of the most biologically-diverse places and a popular ecotourism destination. However, the area faces watershed degradation and loss of biodiversity due to deforestation, pollution from agriculture, and human settlement. NASA DEVELOP partnered with Osa Conservation to analyze land cover change to understand watershed health using the Landsat series for land management decisions, policy enforcement, outreach initiatives, and watershed restoration and monitoring.	Suravi Shrestha Project Lead / NASA DEVELOP
1:40 - 1:47 PM Summer in the City: Assessing the Urban Heat Island in Washoe County, NV	The urban heat island (UHI) effect is the tendency of urban areas to retain and emanate heat longer than surrounding rural regions, leading to poor air quality, increased risk of heat-related illness, and discouragement of active transportation methods in the urban population. NASA DEVELOP partnered with officials in Washoe County, Nevada to assess their UHI using NASA Earth Observations, enabling them to mitigate the effects and meet future public health goals.	Mariah Heck Researcher, NASA DEVELOP Program
1:50 - 1:57 PM Introducing the Computational Reconfigurable Imaging Spectrometer (CRISP)	The Computational Reconfigurable Imaging Spectrometer (CRISP) is a new imaging spectrometer suitable for hyperspectral and multispectral missions in remote sensing for Earth science. CRISP's novel design will enable high performance from smaller and less-expensive components, such as uncooled microbolometers, and be suitable for small satellites that can be deployed in constellations.	Adam Milstein Technical Staff, MIT, Lincoln Laboratory
2:00 - 2:07 PM Discover and Access International Space Station (ISS) ECOSTRESS & GEDI Data	The NASA Land Processes Distributed Active Archive Center (LP DAAC) is pleased to announce new up and coming data products! These include data products derived from two new NASA Missions hosted on the International Space Station (ISS)—the ECOSystem Spaceborne Thermal Radiometer Experiment on Space Station (ECOSTRESS) and the Global Ecosystem Dynamics Investigation (GEDI). ECOSTRESS monitors temperature changes in plants from space and provides insight into plant health. GEDI provides measurements of Earth's 3D structure through its LIDAR instrument.	Sydney Neeley Geospatial Data Scientist, NASA LP DAAC

Detailed Descriptions of Flash Talks

Time/Title	Description	Presenter
2:10 - 2:17 PM Panoply: A Super-Easy, Cross-Platform Tool for Viewing Earth Observation Data and Models	The Panoply tool from NASA is a simple point-and-click tool for viewing Earth observation data and models in standard data formats. It is available for Windows, Macintosh and Linux, installs easily, and offers a simple but powerful interface. It can display gridded, satellite swath and trajectory data on a map in a variety of projections, as well as time-series, Hovmoller diagrams, vertical cross-sections, and zonal means. Download Panoply from https://www.giss.nasa.gov/tools/panoply/download .	Christopher Lynnes System Architect, NASA/GSFC Earth Observing System Data and Information System (EOSDIS)
2:20 - 2:27 PM Airborne Data Visualizer: Explore Data from the NASA Earth Venture Suborbital Program	The NASA Earth Venture Suborbital (EVS) program is generating valuable data measured from aircraft. Unlike space-based remote sensing observations, the data from EVS missions are spatially sparse, temporally irregular, and in some cases dependent on the altitude of the observation. The Airborne Data Visualizer developed at Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC) allows for convenient exploration and interpretation of the diverse datasets produced by the Carbon in Arctic Reservoirs Vulnerability Experiment (CARVE), Atmospheric Carbon and Transport – America (ACT-America), and Atmospheric Tomography Mission (ATom) missions.	Jack McNelis Remote Sensing Scientist, ORNL DAAC
2:30 - 2:37 PM Citizen Science Data for Earth System Science	Ground-based validation data can be challenging and expensive to collect. GLOBE Observer offers an inexpensive option for cloud, land cover, and mosquito habitat data. An app based citizen science project, GLOBE Observer collects geo-tagged photos with associated classification data (cloud type, land cover type, etc.). GLOBE Observer is interested in building relationships with scientists to increase the usage and value of citizen science data. This talk will discuss the usefulness and limits of GLOBE Observer citizen science data as well as how to access the data.	Holli Kohl Globe Observer Project Lead NASA GSFC
2:40 - 2:47 PM Buildings, Borders, and 'Burbs': Mapping Our Human Planet	The NASA Socioeconomic Data and Applications Center (SEDAC) provides coordinated access to a range of data products and services that map the human planet—including settlements, population characteristics, administrative boundaries, and the built infrastructure—drawing on a growing variety of remote sensing and other data sources. Come see how you can compare, visualize, and access these data for a wide range of research and applications!	Robert Chen Manager, NASA Socioeconomic Data and Applications Center (SEDAC); Director, Center for International Earth Science Information Network (CIESIN), Columbia University



Detailed Descriptions of Live Demonstrations

Time	Description	Presenter
Monday, December 10		
6:00 - 8:00 PM Subsetting and Visualizing NASA's MODIS and VIIRS Land Products with the Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC) Tools Suite	The Moderate Resolution Imaging Spectroradiometer (MODIS) offers almost 18 years of consistently produced land product data. The recently released Visible Infrared Imaging Radiometer Suite (VIIRS) land products provide continuity to the MODIS mission by extending and improving upon the MODIS measurements. Because of the complexity and the size of these products, users in the land science community requested the capability to define their own spatial and temporal subsets of the data and to download these data in standard scientific formats. The Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC) developed a suite of user-friendly tools that offer easy retrieval of the data products generated from these sensors. Recent developments include, adding VIIRS Land Products and Daymet weather data, a new RESTful web service, and improvements to the interface and visualization capabilities. This demonstration will include a hands-on demo of these new features and capabilities. https://modis.ornl.gov	Rupesh Shrestha Research Staff, NASA Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC) for Biogeochemical Dynamics
Tuesday, December 11		
10:00 - 11:00 AM An overview of FIRMS, the Fire Information for Resource Management System that provides satellite-derived near real-time fire information to users around the world.	The Fire Information for Resource Management System (FIRMS) distributes Near Real-Time (NRT) active fire data within 3 hours of satellite observation from both the Moderate Resolution Imaging Spectroradiometer (MODIS) and the Visible Infrared Imaging Radiometer Suite (VIIRS). The active fire / hotspot data can be viewed in FIRMS Fire Map or in NASA's Worldview, delivered as email alerts or downloaded in the following formats: SHP, KML, TXT, WMS. The demonstration will provide an overview of the system, a tour for FIRMS Fire Map, and explain how to download data and to sign up for fire email alerts. FIRMS is part of NASA's Land, Atmosphere Near real-time Capability for EOS (LANCE).	Diane Davies Operations Manager – Land, Atmosphere Near real-time Capability for EOS (LANCE)
11:00 - 12:00 PM Solar System Treks - Interactive visualization and analysis tools enabling mission planning, scientific research, education and public outreach.	We will demonstrate various Solar System Treks portals (such as Moon Trek https://moontrek.jpl.nasa.gov , Mars Trek https://marstrek.jpl.nasa.gov , and Vesta Trek https://vestatrek.jpl.nasa.gov). Trek portals are web based applications that allow users to interact and explore a growing number of planetary bodies. Users can view the data in 2D and 3D from many instruments on board various past and current missions. They can maneuver interactive flyover and generate 3D model files. The portals also provide tools for virtual reality experience and analysis tools such as rock and crater detection.	Emily Law Manager, Solar System Treks Project
12:00 - 2:00 PM Visit the International Space Station, Home to the SAGE III Instrument	NASA's Stratospheric Aerosol and Gas Experiment (SAGE) III instrument is used to study ozone, a gas found in the upper atmosphere that acts as Earth's sunscreen. Instead of flying on an un-manned satellite, SAGE III is mounted to the International Space Station (ISS) where it operates alongside experiments from all over the world. The orbital path of the ISS helps maximize the scientific value of SAGE III observations, while proving that atmospheric science instruments do have a place on the space station. This virtual reality experience will allow exhibit visitors to take a look at where SAGE III lives aboard the ISS.	Marliee Roell SAGE III/ISS Science Manager, NASA LaRC Allison Leybold SAGE III/ISS Communications Lead, NASA LaRC
2:00 - 3:00 PM Hot & sPyC: Enabling software developers to target heterogeneous on-board computing accelerators.	Satellites and unmanned aerial vehicle (UAVs) often utilize custom accelerators such as Field Programmable Gate Arrays (FPGAs) to perform on-board processing. While FPGAs provide high processing efficiency and resiliency, they are programmed in specialized languages (VHDL, Verilog) and have long development times (months). This leaves a large gap between the scientists developing algorithms and the hardware engineers implementing them. To address this, Hot & sPyC (https://spicy.isi.edu) enables Python software developers to create custom FPGA hardware accelerators. This suite of tools eases the packaging, integration, and binding of hardware accelerators callable from a Python application. Algorithm developers can then quickly explore implementation trade-offs and arrive at a more efficient implementation. This demonstration highlights canny edge detection image processing, where Python was used to produce several implementations in a matter of hours that increased the frame rate by 20x versus a hand coded implementation which took months to complete.	Matthew French Research Director, Information Sciences Institute (ISI)

Detailed Descriptions of Live Demonstrations

Time	Description	Presenter
3:00 - 4:00 PM Power to Explore	Exploring the solar system requires the use of many types of power systems. For each mission, NASA determines what power system fits the requirements of the destination and the objective. Come and experience first-hand some of the technologies behind the power sources that NASA uses in some of the most extreme, most harsh, and most unforgiving environments in our solar system and beyond.	Kristin Spear Outreach Manager, NASA's Radioisotope Power Systems Program
4:00 - 5:30 PM What Color is the Ocean?	Visible light is transmitted or absorbed through water depending upon what's in it. Measure the visible light spectrum through different colored water samples and learn how NASA satellites use this principle to detect chlorophyll, the green pigment in phytoplankton.	Heather Hanson Science Writer, NASA GSFC
Wednesday, December 12		
10:00 - 11:00 AM Spectral Measurements: The World's Fingerprints	Discover how NASA satellites use spectrometer to measure the amount of light reflected off Earth's surface. Different land cover—vegetation, sand, water, rocks—reflect wavelengths of light differently. A graph of these data across the spectrum is called a spectral signature and is as unique as a fingerprint. Try your skill at reading these fingerprints by matching spectral signatures with features in satellite images.	Michael Taylor Outreach Scientist, Landsat Communications
11:00 - 12:00 PM Explore our dynamic planet with NASA Worldview!	This web map application provides a platform to view the world as it has been every day for the past 18 years using data from NASA's fleet of Earth Observing System (EOS) satellites. You can use Worldview (https://worldview.earthdata.nasa.gov) to investigate long and short term changes due to events like wildfires, severe storms, floods, air quality, and many other changes going on around the world. Come and learn about our newest feature, the image comparison tool, where you can look at before and after effects of events like the impact of a wildfire on the landscape. We will also demonstrate a prototype of Worldview AR (Augmented Reality), a new way to interact with the imagery draped over a view of the real world. Using a tablet, the imagery is shown in mid-air on a globe and on a table. Come by and play with our prototype or participate in a multiplayer trivia game with us!	Minnie Wong Systems Engineer, NASA Worldview
12:00 - 2:00 PM Visit the International Space Station, Home to the SAGE III Instrument	NASA's Stratospheric Aerosol and Gas Experiment (SAGE) III instrument is used to study ozone, a gas found in the upper atmosphere that acts as Earth's sunscreen. Instead of flying on an un-manned satellite, SAGE III is mounted to the International Space Station (ISS) where it operates alongside experiments from all over the world. The orbital path of the ISS helps maximize the scientific value of SAGE III observations, while proving that atmospheric science instruments do have a place on the space station. This virtual reality experience will allow exhibit visitors to take a look at where SAGE III lives aboard the ISS.	Marlee Roell SAGE III/ISS Science Manager, NASA LaRC Allison Leybold SAGE III/ISS Communications Lead, NASA LaRC
2:00 - 3:00 PM An overview of FIRMS, the Fire Information for Resource Management System that provides satellite-derived near real-time fire information to users around the world.	The Fire Information for Resource Management System (FIRMS) distributes Near Real-Time (NRT) active fire data within 3 hours of satellite observation from both the Moderate Resolution Imaging Spectroradiometer (MODIS) and the Visible Infrared Imaging Radiometer Suite (VIIRS). The active fire / hotspot data can be viewed in FIRMS Fire Map or in NASA's Worldview, delivered as email alerts or downloaded in the following formats: SHP, KML, TXT, WMS. The demonstration will provide an overview of the system, a tour for FIRMS Fire Map, and explain how to download data and to sign up for fire email alerts. FIRMS is part of NASA's Land, Atmosphere Near real-time Capability for EOS (LANCE).	Diane Davies Operations Manager – Land, Atmosphere Near real-time Capability for EOS (LANCE)

Detailed Descriptions of Live Demonstrations (cont.)

Time	Description	Presenter
3:00 - 4:00 PM NASA Physical Oceanography Distributed Active Archive Center (PO.DAAC)	<p>The Physical Oceanography Distributed Active Archive Center (PO.DAAC) is in the process of retiring its FTP server for data access. In its place is a new protocol known as Earthdata Drive, thus is actually a NASA wide implementation for access at all NASA data centers. In this presentation we will demonstrate the PO.DAAC implementation of this technology and other services for accessing PO.DAAC data and metadata. This will include the Python module <code>podaacpy</code> that provides the user with a wrapper to search and discover dataset metadata and granule endpoints including those served via OPeNDAP. We will demonstrate several use cases for search, discovery, and data access using these protocols.</p>	Ed Armstrong Data Engineer, NASA Physical Oceanography Distributed Active Archive Center (PO.DAAC)
4:00 - 5:30 PM NeMO-Net Interactive Learning Application	<p>NeMO-Net is a machine learning project aimed at understanding the world's coral reefs using a range of unmanned aerial vehicle (UAV), high-altitude airborne, and satellite assets. Because machine learning algorithms require training data, we have developed a citizen science game where players are able to help NASA classify coral cover and morphologies by painting on 2D and 3D images of coral. Over time, the abundance of user generated data will allow the algorithm to autonomously classify these endangered aquatic ecosystems.</p>	Alan Li and Jarrett van den Bergh Research Engineers, NASA Ames Research Center Ved Chirayath Research Scientist, NASA Ames Research Center
Thursday, December 13		
10:00 - 11:00 AM Spectral Measurements: The World's Fingerprints	<p>Discover how NASA satellites use spectrometer to measure the amount of light reflected off Earth's surface. Different land cover—vegetation, sand, water, rocks—reflect wavelengths of light differently. A graph of these data across the spectrum is called a spectral signature and is as unique as a fingerprint. Try your skill at reading these fingerprints by matching spectral signatures with features in satellite images.</p>	Michael Taylor Outreach Scientist, Landsat Communications
11:00 - 12:00 PM Visualize and Access NASA Biogeochemical and Ecological Data through the Spatial Data Access Tool	<p>The Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC) Spatial Data Access Tool (SDAT) is an Open Geospatial Consortium (OGC) standards-based Web application to visualize and download spatial data in various user-selected spatial/temporal extents, file formats, and projections. Over 170 datasets including climate, land surface, biophysical, hydrosphere, and soil data are available through SDAT. KMZ files are also provided for data visualization in Google Earth. This demo will show hands-on instructions on how to visualize and access NASA biogeochemical and ecological data through SDAT. It will also highlight latest features added to SDAT, including the enhanced data search capabilities and tabular data visualization and subset. To learn more, visit https://webmap.ornl.gov/ogc.</p>	Yaxing Wei Geospatial Data Scientist, NASA Land Processes Distributed Active Archive Center (LP DAAC)
12:00 - 1:00 PM Hot & sPyC: Enabling software developers to target heterogeneous on-board computing accelerators.	<p>Satellites and unmanned aerial vehicle (UAVs) often utilize custom accelerators such as Field Programmable Gate Arrays (FPGAs) to perform on-board processing. While FPGAs provide high processing efficiency and resiliency, they are programmed in specialized languages (VHDL, Verilog) and have long development times (months). This leaves a large gap between the scientists developing algorithms and the hardware engineers implementing them. To address this, Hot & sPyC (https://spicy.isi.edu) enables Python software developers to create custom FPGA hardware accelerators. This suite of tools eases the packaging, integration, and binding of hardware accelerators callable from a Python application. Algorithm developers can then quickly explore implementation trade-offs and arrive at a more efficient implementation. This demonstration highlights canny edge detection image processing, where Python was used to produce several implementations in a matter of hours that increased the frame rate by 20x versus a hand coded implementation which took months to complete.</p>	Matthew French Research Director, Information Sciences Institute (ISI)

Detailed Descriptions of Live Demonstrations

Time	Description	Presenter
1:00 - 2:00 PM Using NASA's AppEEARS to Access Geospatial Data	NASA's Application for Extracting and Exploring Analysis Ready Samples (AppEEARS) assists you with extracting valuable information from geospatial data from several federal data archives. AppEEARS provides a user-friendly interface for reducing the amount of time and effort traditionally required to perform spatial and temporal subsets, reproject and mosaic data, and visualize data values graphically. A demonstration will be given of the functionalities of AppEEARS and case examples will be explored for submitting both point (geographic coordinate pairs) and area (vector polygons) requests.	Sydney Neeley Geospatial Data Scientist, NASA Land Processes Distributed Active Archive Center (LP DAAC)
2:00 - 3:00 PM NASA PO.DAAC State Of The Ocean: I spy with my little eye something...	This demo will introduce participants to the NASA Physical Oceanography Distributed Active Archive Center's State Of The Ocean (SOTO) toolkit. SOTO offers a range of visualization and data comparison capabilities, presented through an interactive, web-based visualization front end, for physical oceanographic data. It provides a view of key oceanographic and climate-related phenomenon, including ocean surface winds, ocean surface topography, sea surface salinity, sea surface temperature, ocean currents and circulation, as well as additional Earth system data, such as soil moisture, surface precipitation, and sea ice.	Jessica Hausman Data Engineer, NASA Physical Oceanography Distributed Active Archive Center (PO.DAAC)
3:00 - 4:00 PM NASA Physical Oceanography Distributed Active Archive Center (PO.DAAC)	The Physical Oceanography Distributed Active Archive Center (PO.DAAC) is in the process of retiring its FTP server for data access. In its place is a new protocol known as Earthdata Drive, thus is actually a NASA wide implementation for access at all NASA data centers. In this presentation we will demonstrate the PO.DAAC implementation of this technology and other services for accessing PO.DAAC data and metadata. This will include the Python module podaacpy that provides the user with a wrapper to search and discover dataset metadata and granule endpoints including those served via OPeNDAP. We will demonstrate several use cases for search, discovery, and data access using these protocols.	Ed Armstrong Data Engineer, NASA Physical Oceanography Distributed Active Archive Center (PO.DAAC)
4:00 - 5:30 PM NeMO-Net Interactive Learning Application	NeMO-Net is a machine learning project aimed at understanding the world's coral reefs using a range of unmanned aerial vehicle (UAV), high-altitude airborne, and satellite assets. Because machine learning algorithms require training data, we have developed a citizen science game where players are able to help NASA classify coral cover and morphologies by painting on 2D and 3D images of coral. Over time, the abundance of user generated data will allow the algorithm to autonomously classify these endangered aquatic ecosystems.	Alan Li and Jarrett van den Bergh Research Engineers, NASA Ames Research Center Ved Chirayath Research Scientist, NASA Ames Research Center
Friday, December 14		
9:30 - 10:30 AM Solar System Treks - Interactive visualization and analysis tools enabling mission planning, scientific research, education and public outreach.	We will demonstrate various Solar System Treks portals (such as Moon Trek https://moontrek.jpl.nasa.gov , Mars Trek https://marstrek.jpl.nasa.gov , and Vesta Trek https://vestatrek.jpl.nasa.gov). Trek portals are web based applications that allow users to interact and explore a growing number of planetary bodies. Users can view the data in 2D and 3D from many instruments on board various past and current missions. They can maneuver interactive flyover and generate 3D model files. The portals also provide tools for virtual reality experience and analysis tools such as rock and crater detection.	Emily Law Manager, Solar System Treks Project
10:30 -1:30 PM Educational Outreach and STEM Engagement Specialist, NASA GSFC Exploration & Space Communications Projects	NASA Space Communications and Navigation (SCaN) is piloting an accessible electronics demonstration kit which educates the public on optical (laser-based) communications technology. Laser systems require 50% less payload mass, 25% less power, and offer approximately 40 times the bandwidth over comparable radio setups. Our kit costs less than \$100 and can be set up in an afternoon by anyone with basic electronics skills. It shows real-time atmospheric data being transmitted from one microcontroller to another through the air using human-visible laser light, and is a tangible example of the benefits mentioned above. We encourage you to consider the potential cost savings and added throughput for your science objectives. We are happy to share documentation about the demonstration kit and, more broadly, the benefits of optical systems and their role within NASA's next-generation communications networks.	James Acevedo Educational Outreach and STEM Engagement Specialist, NASA GSFC Exploration & Space Communications Projects

Detailed Descriptions of Virtual Reality Demonstrations

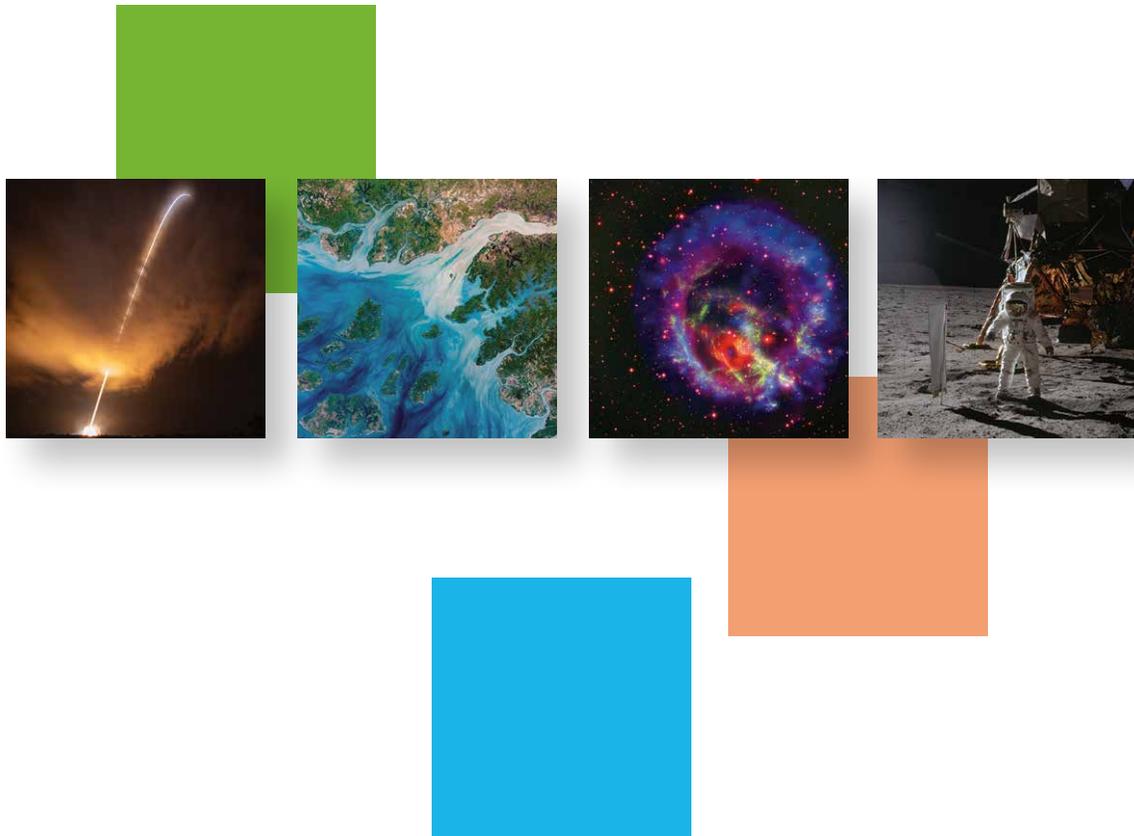
Time	Description	Presenter
Monday, December 10		
6:00 - 8:00 PM Flooded! Exploring NASA Disaster Applications Data and Catastrophic Flooding with Virtual Reality	Navteca, along with the NASA Applied Sciences Disaster Applications Group, within the Earth Science Division of NASA's Science Mission Directorate, and the NASA Information Technology Communications Directorate (ITCD) has been researching virtual reality (VR) technology for the next generation of Earth science technology information systems. Through demos of three dimensional (3D) virtual city models, end users are able to view data from relevant NASA and NOAA datasets in an immersive, interactive VR environment. The custom-developed VR interface, a 3D model of San Juan, Puerto Rico displays an interactive water level tool to demonstrate the severe flooding after Hurricane Maria and simulated flooding for different category hurricanes. Users will also experience simulated flooding in the area around Hampton, Virginia near NASA Langley Research Center and the aftermath of Hurricane Florence in the Carolinas. By focusing on disaster scenarios, this research is investigating whether VR technology can help develop enhanced tools that will inform data-driven decisions.	Shayna Skolnik Navteca / NASA Applied Sciences Disaster Applications Group
Tuesday, December 11		
10:00 - 2:30 PM Science Data Visualizations in Augmented Reality (AR)/Virtual Reality (VR) for Planetary and Earth Science	Virtual Reality (VR) and Augmented Reality (AR) are changing how NASA does business and will enable NASA scientists and engineers to more intuitively visualize and manipulate data in many different domains. The NASA Goddard Space Flight Center (GSFC) AR/VR team, of the Science Data Processing Branch, has been developing pilot research applications for applying AR/VR to planetary science, earth science, astrophysics, heliophysics, and exploration. We plan to demo several pilots depending on the user's expertise, including: using LIDAR data for visualizing lava tubes and mushroom caps and the Puerto Rican rain-forest; exploring 4 million stars to find moving star groups from Gaia DR2 data; visualizing the interaction of the solar wind with the Martian magnetosphere based on model data derived from MAVEN data; and exploring habitat and terrain for VR environment for an existing HEO-funded long duration habitation study, HISEAS (Hawai'i Space Exploration Analog and Simulation).	Thomas Grubb AR/VR Product Development Lead, NASA Goddard Space Flight Center
2:30 - 5:30 PM Virtual Reality Tool for Earth Science Data	Come check out updates to our virtual reality (VR) tool for interacting with Earth science data. This software was developed to help scientists better understand their data within a fully immersive virtual environment.	Joe Roberts Data Visualization Developer, Jet Propulsion La
Wednesday, December 12		
10:00 - 12:00 PM Flooded! Exploring NASA Disaster Applications Data and Catastrophic Flooding with Virtual Reality	Navteca, along with the NASA Applied Sciences Disaster Applications Group, within the Earth Science Division of NASA's Science Mission Directorate, and the NASA Information Technology Communications Directorate (ITCD) has been researching virtual reality (VR) technology for the next generation of Earth science technology information systems. Through demos of three dimensional (3D) virtual city models, end users are able to view data from relevant NASA and NOAA datasets in an immersive, interactive VR environment. The custom-developed VR interface, a 3D model of San Juan, Puerto Rico displays an interactive water level tool to demonstrate the severe flooding after Hurricane Maria and simulated flooding for different category hurricanes. Users will also experience simulated flooding in the area around Hampton, Virginia near NASA Langley Research Center and the aftermath of Hurricane Florence in the Carolinas. By focusing on disaster scenarios, this research is investigating whether VR technology can help develop enhanced tools that will inform data-driven decisions.	Shayna Skolnik Navteca / NASA Applied Sciences Disaster Applications Group
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Detailed Descriptions of Virtual Reality Demonstrations

Time	Description	Presenter
3:00 - 5:30 PM Virtual Reality Tool for Earth Science Data	<p>Come check out updates to our virtual reality (VR) tool for interacting with Earth science data. This software was developed to help scientists better understand their data within a fully immersive virtual environment.</p>	Joe Roberts Data Visualization Developer, Jet Propulsion Lab
Thursday, December 13		
10:00 - 1:00 PM James Web Space Telescope in Virtual Reality	<p>Come see the Webb Telescope in full-size 3D out at Lagrangian point 2 (L2)! You can also travel to other planets, fly through a galaxies, or build a planet out of rock and ice! Our interactive virtual reality is sure to amaze and engage you!</p>	Alexandra Lockwood JWST Science Communications Lead, Space Telescope Science Institute
1:00 - 3:00 PM Flooded! Exploring NASA Disaster Applications Data and Catastrophic Flooding with Virtual Reality	<p>Navteca, along with the NASA Applied Sciences Disaster Applications Group, within the Earth Science Division of NASA's Science Mission Directorate, and the NASA Information Technology Communications Directorate (ITCD) has been researching virtual reality (VR) technology for the next generation of Earth science technology information systems. Through demos of three dimensional (3D) virtual city models, end users are able to view data from relevant NASA and NOAA datasets in an immersive, interactive VR environment. The custom-developed VR interface, a 3D model of San Juan, Puerto Rico displays an interactive water level tool to demonstrate the severe flooding after Hurricane Maria and simulated flooding for different category hurricanes. Users will also experience simulated flooding in the area around Hampton, Virginia near NASA Langley Research Center and the aftermath of Hurricane Florence in the Carolinas. By focusing on disaster scenarios, this research is investigating whether VR technology can help develop enhanced tools that will inform data-driven decisions.</p>	Shayna Skolnik Navteca / NASA Applied Sciences Disaster Applications Group
3:00 - 5:30 PM Science Data Visualizations in Augmented Reality (AR)/Virtual Reality (VR) for Planetary and Earth Science	<p>Virtual Reality (VR) and Augmented Reality (AR) are changing how NASA does business and will enable NASA scientists and engineers to more intuitively visualize and manipulate data in many different domains. The NASA Goddard Space Flight Center (GSFC) AR/VR team, of the Science Data Processing Branch, has been developing pilot research applications for applying AR/VR to planetary science, earth science, astrophysics, heliophysics, and exploration. We plan to demo several pilots depending on the user's expertise, including: using LIDAR data for visualizing lava tubes and mushroom caps and the Puerto Rican rain-forest; exploring 4 million stars to find moving star groups from Gaia DR2 data; visualizing the interaction of the solar wind with the Martian magnetosphere based on model data derived from MAVEN data; and exploring habitat and terrain for VR environment for an existing HEO-funded long duration habitation study, HISEAS (Hawai'i Space Exploration Analog and Simulation).</p>	Thomas Grubb AR/VR Product Development Lead, NASA Goddard Space Flight Center
Friday, December 14		
9:30 - 1:30 PM James Webb Space Telescope in Virtual Reality	<p>Come see the Webb Telescope in full-size 3D out at L2! You can also travel to other planets, fly through a galaxies, or build a planet out of rock and ice! Our interactive virtual reality is sure to amaze and engage you!</p>	Alexandra Lockwood JWST Science Communications Lead, Space Telescope Science Institute

NASA's Vision

To reach for new heights and reveal
the unknown so that what we do and
learn will benefit all humankind.



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