Workshop on:

Global Earth Imaging Spectroscopy and Thermal Infrared Measurements (HyspIRI)

NASA Decadal Survey Mission Concept

17-19 October 2017

Beckman Institute Auditorium (BIA), California Institute of Technology

1200 E California Blvd, Pasadena, CA 91125

TUESDAY

Time	Title	Speakers	Authors (TBC)
8:00 AM	Registration Opens (Session Chair: Robert O. Green)		
9:00 AM	Welcome and Objectives of the HyspIRI Science and Applications Workshop	Woody Turner and Ben Phillips	Woody Turner and Ben Phillips
9:20 AM	Overview of the Mission Concept, Measurements and Science	Robert O. Green, Simon Hook, Betsy Middleton	Robert O. Green, Simon Hook, Betsy Middleton
10:00 AM	Update on HyspIRI Preparatory Airborne Campaigns: Western US; Volcano and Coral Reef, Hawaii	Ian McCubbin	HyspIRI Team
10:20 AM	Break/Picture		
10:40 AM	Mapping Ecosystem Function and Biogeochemical Processes in a Global Imaging Spectroscopy Mission	Phil Townsend	Philip A. Townsend, Aditya Singh, John J. Couture and Eric L. Kruger
11:00 AM	Measuring Biodiversity Globally	Ryan Pavlick	Ryan Pavlick and Dave Schimel
11:20 AM	Improved Measurement of Carbon Emissions from Biomass Burning	Simon Hook	Simon Hook
11:40 AM	Comparing methods for mapping fractional cover using simulated HyspIRI spectra	Phil Dennison	Phil Dennison
12:00 PM	Lunch (Session Chair: Woody Turner)		
1:20 PM	Monitoring Coastal and Wetland Biodiversity from Space	Frank Muller-Karger	Frank Muller-Karger
1:40 PM	Results from ALI and OLI Multispectral Band Synthesis, Machine Learning Classification, and Salience onboard the Earth Observing One Mission	Steve Chien	Steve Chien
2:00 PM	Predicting changes in the behavior of erupting volcanoes, and reducing the uncertainties associated with their impacts	Rob Wright	Rob Wright
2:20 PM	Coral Reef Condition Across the Hawaiian Archipelago and Relationship to Environmental Forcing	Eric Hochberg	Eric Hochberg
2:40 PM	Measuring the Earth's Surface Mineral Dust Source Composition to Model Radiative Forcing and Related Earth System Impacts	Vince Realmuto	Vince Realmuto
3:00 PM	Break		
3:20 PM	Earth Surface Geochemistry and Mineralogy: Processes, Hazards, Soils, and Resources	Robert O. Green	Robert O. Green
3:40 PM	Measuring Fire Fuel, Occurrence, Severity, and Recovery	Natasha Stavros	Natasha Stavros
4:00 PM	Remote Sensing of Aquatic and Terrestrial Biodiversity Across Watersheds	Erin Hestir	Erin Hestir
4:20 PM	Can HyspIRI-like data constrain accurate temperature and emissivity measurements of active volcanic surfaces?	Michael Ramsey	Michael Ramsey and James Thompson
4:40 PM	Joint Estimation of Atmosphere and Surface Reflectance from AVIRIS-NG Spectra: Initial Results	David R. Thompson	David R. Thompson
5:00 PM	Measurements and Early Science Results from the NASA and ISRO Joint Imaging Spectroscopy Campaign in India	Robert O. Green	Robert O. Green
5:20 PM	Closing / Adjourn		

WEDNESDAY

Time	Title	Speakers	Authors
7:40 AM	Registration Opens (Session Chair: Kevin Turpie)		
8:00 AM	Assessing variability of coral reflectance in response to biodiversity of host and symbiont and morphology	Heidi Dierssen	Heidi Dierssen
8:20 AM	Visible Derivative Spectroscopy of Multispectral and Hyperspectral Images: A New Approach to Algal and Cyanobacterial Differentiation	Jeff Luvall	Joseph Ortiz and Jeff Luvall
8:40 AM	Global Observations of Coastal and Inland Aquatic Habitats and Progress in the Remote Sensing Community	Kevin Turpie	Kevin Turpie
9:00 AM	Evaluation and Application of the AVIRIS Data for the Study of Coral Reefs in Hawaii	Jianwei Wei	Jianwei Wei
9:20 AM	Using HyspIRI to Identify Benthic Composition and Bleaching in Shallow Coral Reef Ecosystems	Tom Bell	Tom Bell
9:40 AM	COral Reef Airborne Laboratory: Status and Initial Results	Eric Hochberg	Eric Hochberg
10:00 AM	Global Observations of Coastal and Inland Aquatic Habitats and Progress in the Remote Sensing Community	Kevin Turpie	Kevin Turpie
10:20 AM	Estimation of Benthic Reflectance with Bayesian Mixture Models	David R. Thompson	David R. Thompson
10:40 AM	Integrated Vector Management in Cambodia: Operational Integration for Malaria Elimination	Jeff Luvall	Jeff Luvall
11:00 AM	Ecosystem Structure, Composition, and Function: Ecological Responses to Environmental Perturbations in Mammoth Mountain, California	Joshua Fisher	Joshua Fisher
11:20 AM	Filling the gaps: How maps derived from imaging spectroscopy augments ground based measurements of plant functional traits	Phil Townsend	Philip A. Townsend, Zhihui Wang, Anna K. Schweiger, Jeannine Cavender-Bares and Aditya Singh
11:40 AM	HyspIRI Airborne Science: Combining Multi-Sensor Remote Sensing and Dispersion Modeling to Study the Impact of Volcanic Sulfur Dioxide Emissions on Air Quality in Hawaii	Vince Realmuto	Vince Realmuto
12:00 PM	Lunch (Session Chair: Simon Hook)		
1:10 PM	Imaging Spectrometer Retrievals of Methane, Carbon Dioxide, and Water Vapor Concentrations at High Spatial Resolution: Application to AVIRIS-NG	Andrew Thorpe	Andrew Thorpe
1:30 PM	Imaging Spectroscopy Investigations of Cloud Processes at 30 m Spatial Resolution	David R. Thompson	David R. Thompson
1:50 PM	Poster Session and Sub Group Discussions	Outside Adjacent to BIA	Outside Adjacent to BIA
2:10 PM	Poster Session and Sub Group Discussions	Outside Adjacent to BIA	Outside Adjacent to BIA
2:30 PM	Poster Session and Sub Group Discussions	Outside Adjacent to BIA	Outside Adjacent to BIA
2:50 PM	Poster Session and Sub Group Discussions	Outside Adjacent to BIA	Outside Adjacent to BIA
3:10 PM	The ECOSTRESS Mission on the International Space Station: An Overview	Simon Hook	Simon Hook
3:30 PM	ALEXI ET modeling	Kerry Cawse-Nicholson	Kerry Cawse-Nicholson
3:50 PM	The ECOSTRESS Spectral Library	Susan Meerdink	Susan Meerdink
4:10 PM	Precursor Applications Activities for ECOSTRESS and HyspIRI Missions	Christine Lee	Christine Lee
4:20 PM	Evapotranspiration: A critical variable linking ecosystem functioning, carbon and climate feedbacks, agricultural management, and water resources	Joshua Fisher	Joshua Fisher
4:40 PM	Investigation of urban heat island and heat wave interactions with remotely sensed thermal data: a case study over LA	Glynn Hulley	Glynn Hulley
5:00 PM	ECOSTRESS Delta Project: ET model intercomparison	Yufang Jin	Yufang Jin, Andy Wong
5:10 PM	Assessing variable landscape response to drought in Costa Rica	Savannah Cooley	Savannah Cooley
5:30 PM	Closing / Adjourn		
	Understanding the Controls on Cryospheric Albedo, Energy Balance, and Melting	Thomas Painter	Thomas Painter

THURSDAY

Time	Title	Speakers	Authors
7:40 AM	Registration Opens (Session Chair: Betsy Middleton)		
8:00 AM	Unmanned Aerial Technologies for In Situ Validation of Remote Sensing Data and Retrievals at Active Volcanoes	David Pieri	David Pieri and Jorge Andres Diaz
8:20 AM	Full Physics-based Radiative Transfer Model for Ocean Observation: Application to HyspIRI-type Imaging Spectrometer	Pengwang Zhai	Pengwang Zhai
8:40 AM	Hyperspectral Remote Sensing of World's Leading Agricultural Crops	Prasad Thenkabail	Prasad Thenkabail
9:00 AM	Mineral Potential in Hutti-Maski Greenstone Belt, India using Airborne Visible/Infrared Imaging Spectrometer-Next Generation (AVIRIS-NG) Data	Snehamoy Chatterjee	Snehamoy Chatterjee

Time	Title	Lead	Authors
9:20 AM	Using AVIRIS-NG Data to Assess the Impact of Mining Activities on Soils and Water Quality near the Ambaji and Zawar Mines in Gujurat and Rajasthan, India.	Bill Farrand	Bill Farrand
9:40 AM	Improved Trace Gas Plume Detection using Indian and US AVIRIS-NG Data	Phil Dennison	Phil Dennison
10:00 AM	Lake's Surface Water Temperature Changes over Tibetan Plateau based on MODIS LST product (2001-2015): A sensitive Indicator for the Warming Climate	Hongie Xie	Hongie Xie
10:20 AM	Break		
10:40 AM	Towards a Verdict on the Influence of Sub-pixel Vegetation Variation on Global Ecosystem Assessment via Imaging Spectroscopy	John Kerekes	Wei Yao, Jan van Aardt, John Kerekes
11:00 AM	Hyperspectral Reflectance from Shallow Coral Reefs: Exploring the Red Edge	Steven G. Ackleson	Steven G. Ackleson and Wesley J. Moses
11:20 AM	In-flight Characterization of Imaging Spectrometer Spectral Response	David R. Thompson	David R. Thompson
11:40 AM	Monitoring Ecosystem Stress and Carbon Uptake with Reflectance and Fluorescence Measurements	Elizabeth Middleton	Elizabeth Middleton
12:00 PM	Lunch (Session Chair: David Thompson)		
1:10 PM	Update on Sentinel and Potential Expansion	Jens Nieke	Jens Nieke
1:20 PM	Relevance of EO-1 Hyperion-derived Spectral Surface Reflectance from "Lunar Cal Sites" to HyspIRI	Stephen Ungar	Stephen Ungar
1:40 PM	Understanding the Controls on Cryospheric Albedo, Energy Balance, and Melting	Thomas Painter	Thomas Painter
2:00 PM	Development of an Algorithm for Removing Thin Cirrus Scattering Effects in Landsat 8 OLI Data using AVIRIS-Classic	Bo-Cai Gao	Bo-Cai Gao
2:20 PM	Classification of Lianas and Trees using Visible-near Infrared or Long-wave Infrared Reflectance: New Perspectives for Forest Mapping	Antonio Guzman	Antonio Guzman, G. Arturo Sanchez-Azofeifa
2:40 PM	California Drought Implications: Analyzing AVIRIS Fraction of Alive Vegetation Cover and Climatic Trends	Natalie Queally	Natalie Queally
3:00 PM	Break		
3:20 PM	Compatibility of Imaging Spectroscopy and Broadband Multispectral Data	Natasha Stavros	Natasha Stavros
3:40 PM	Understanding Anthropogenic Methane and Carbon Dioxide Point Source Emissions	Riley Duren	Riley Duren
4:00 PM	Cuprite Project	Kerry Cawse-Nicholson	Kerry Cawse-Nicholson
4:20 PM	AVIRIS-NG and Related Contributions to the Arctic Boreal Vulnerability Experiment (ABoVE)	Charles Miller	Charles Miller
4:40 PM	New Developments in Technology to Support Global Spectroscopy Acquisition and Lower Risk	Dan Mandl	Dan Mandl
5:00 PM	High Performance Space Data Acquisition and Compression based on System-on-Chip Instrument Avionics for Space-based Imaging Spectrometers	Didier Keymeulen	Didier Keymeulen
5:20 PM	Workshop Summary and Plans for Next Year	Woody Turner, Robert O. Green, Simon Hook and Elizabeth Middleton	Woody Turner, Robert O. Green, Simon Hook and Elizabeth Middleton

POSTERS

Number	Title	Lead Author	Authors
1	HISUI Status toward 2019 Launch	Tsuneo Matsunaga	Tsuneo Matsunaga
2	Detecting C4 grass coverage using hyperspectral reflectance	Karl Huemmrich	Karl Huemmrich
3	Detecting change in vegetation stress and extent as a signal of impending volcanic eruptions using AVIRIS VSWIR and MASTER TIR data.	Isabella Mariotto	Isabella Mariotto
4	Imaging Spectroscopy Applications for Assessing Water Contents and Vegetation in Louisiana Coastal Wetlands	Daniel Jensen	Daniel Jensen
5	An Investigation on Spectral Noise in the Hyperspectral Thermal Emission Spectrometer (HyTES)	Kerry Cawse-Nicholson	Kerry Cawse-Nicholson
6	Potential of High Spectral Resolution TEMPO Data for Vegetation Monitoring	Wasit Wulamu	Wasit Wulamu
7	DERIVING THE GEOCHEMICAL CHARACTERISTIC OF CARBONATITES USING VISIBLE NEAR INFRARED AND SHORT WAVE INFRARED SPECTROSCOPY	Ali Assiri	Ali Assiri
8	Compact Snapshot Image Mapping Spectrometer (SNAP-IMS) with an Unmanned Aerial Vehicle for Hyperspectral Terrain Imaging	Jason Dwight	Jason G. Dwight, Tomasz S. Tkaczyk, David Alexander, Michal E. Pawlowski, Jeffrey C. Luvall, Paul Tatum, and Gary J. Jedlovec
9	UAS, Manned Aircraft and Satellite Remote Sensing for Improved Crop Productivity	Wasit Wulamu	Wasit Wulamu
10	Performance comparison of Phased Array Type L-band Synthetic Aperture Radar and Landsat-8 image classification	Swati Garg	Swati Garg
11	Probabilistic unmixing algorithms that use large spectral libraries.	Paul Gader	Yuan Zhou, Erin Wetherley, Paul Gader
12	MMT-Cam: A new miniature multispectral thermal infrared camera system for field-based emissivity measurements	James Thompson	James Thompson and Michael Ramsey
13	Introducing the COAL software suite - Coal and Open-pit surface mining impacts on American Lands	Lewis McGibbney	Lewis McGibbney
14	Change detection in Hawaiian coral reefs from 2000-2017 using AVIRIS and simulated HyspIRI Imagery: Initial Results	Paul Haverkamp	James Goodman, Luis Ramirez, Mui Lay, Susan Ustin, Paul Haverkamp
15	How well do terrestrial biosphere models predict surface energy balance? Confronting an individual-level model with thermal remote sensing data	Miriam Johnston	Miriam Johnston
16	The spectral and chemical measurement of light-absorbing impurities on snow near South Pole, Antarctica	Kimberly Casey	Kimberly Casey
17	A Comparative Study of Random Projection-based Dimensionality Reduction for Remote Sensing Applications	Vineetha Menon	Vineetha Menon
18	EO-1 Hyperion spectral time series for assessment of vegetation carbon flux dynamics	Peyta Campbell	Petya Campbell, K. F. Huemmrich, E. Middleton, C. van der Tol, R. Kokaly, C. Daughtry, S. Voorhies and D. Landis
19	Urban Net Ecosystem Productivity Research: Solar-induced fluorescence as an observational tool?	David Allen	David W. Allen, Lucy Hutyra, Andrew Reinmann, Lauren Cabrera, Andrew Trlica, Julia Marrs, Dianna Belman, Barry Logan, Jaret Reblin, Taylor Jones