

ISSI WORKSHOP on

**Exploring the Earth's Ecosystems on a global scale: Requirements, capabilities
and directions in space-borne imaging spectroscopy**

21-25 November 2016

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MONDAY 21 NOVEMBER 2016

13:00-13:30	Registration	All participants
13:30-13:45	Welcome & Introduction to ISSI	Maurizio Falanga (ISSI)
Session 1	Introductory session	<i>Chair: Nicolas Champollion</i>
13:45-14:00	Introduction & Objectives of the Workshop	Michael Rast
14:00-14:30	Imaging spectroscopy for advanced measurement, monitoring, and modeling the Earth system in the 21st century	Robert Green
14:30-15:00	<i>Coffee break</i>	
Session 2	Vegetation biochemistry & functioning	<i>Chair: Robert Green</i>
15:00-15:30	Revealing hidden photosynthetic activity through optical assessment of pigment dynamics	John Gamon
15:30-16:00	Measuring, understanding and scaling the dynamics of sun- induced fluorescence, photosynthesis and vegetation stress from the leaf to the satellite	Uwe Rascher
Session 3	Ecosystem structure & composition	<i>Chair: Michael Schaepman</i>
16:00-16:30	Overview of recent advances in plant species (and functional type) mapping with imaging spectroscopy	Ben Somers
16:30-17:00	Diurnal and seasonal anisotropy dynamics of SIF and PRI in a cornfield, with influence on remote estimates of GPP	Elizabeth Middleton
17:00	<i>Welcome reception</i>	

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Session 4		Biodiversity	<i>Chair: Nicolas Champollion</i>
09:00-09:30	Measuring Biodiversity from Space		Michael Schaepman
09:30-10:00	Retrieving Remote Sensing Essential Biodiversity Variables (RS-EBVs) from space borne imaging spectroscopy		Andrew Skidmore
10:00-10:30		<i>Coffee break</i>	
Session 5		Inland & coastal water	<i>Chair: Saskia Förster</i>
10:30-11:00	Inland & coastal water quality products from hyperspectral imagery		Ils Reusen
11:00-11:30	Observing aquatic ecosystems from hyperspectral imagery		Claudia Giardino
11:30-12:00	Uncertainties in optical earth observation of water constituents and water optical properties		Roland Doerffer
12:00-13:30		<i>Lunch</i>	
Session 6		Ice & Snow	<i>Chair: Michael Rast</i>
13:30-14:00	Imaging spectroscopy of snow and ice - constraining physically-based modeling of the dwindling cryosphere		Thomas Painter
14:00-14:30	Spectrometry and multispectral sensing: nonlinear approaches to retrieving snow's spectral albedo		Jeff Dozier
Session 7		Soils	<i>Chair: Saskia Förster</i>
14:30-15:00	Global soil mapping & monitoring from imaging spectroscopy data		Sabine Chabrillat
15:00-15:30	Roughness of soils and their spectral imaging		Jerzy Cierniewski
15:30-16:00		<i>Coffee break</i>	
Session 8		Geology & Minerals	<i>Chair: Andreas Müller</i>
16:00-16:30	Exploring spectral deconvolution as a tool for geologic mapping		Véronique Carrere
16:30-17:00	From proximal to satellite geological spectral sensing, a perspective for resource exploration		Derek Rogge

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WEDNESDAY 23 NOVEMBER 2016

Session 9

Natural & man-made hazards

Chair: Luis Guanter

09:00-09:30 Spectroscopic detection and monitoring of environmental hazards **David Thompson**

09:30-10:00 Imaging spectroscopy for monitoring the environment surrounding non-renewable resources developments **Cindy Ong**

10:00-10:30 The need for high resolution hyperspectral and thermal imagery for early detection of plant diseases in forestry and agriculture **Pablo Zarco-Tejada**

10:30-11:00

Coffee break

Session 10

Integrated Earth system applications

Chair: Tobias Hank

11:00-11:30 Custom – tailored hyperspectral observations and onboard generation of information products on a CubeSat: the HyperScout concept **Massimo Menenti**

11:30-12:00 Bringing ecosystem understanding into retrieval platforms of space-borne observations **Peter van Bodegom**

12:00-12:30 Integrated modeling and monitoring of vegetation **Philip Lewis**

12:30-14:00

Lunch

14:00-17:00 General discussion (including coffee break at 15:30) **All participants**

19:00

Apero & Diner at the Tramdepot Restaurant

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THURSDAY 24 NOVEMBER 2016

Session 11	Agriculture, forestry & urban environments	Chair: Luis Guanter
9:00-9:30	Why Global Food Security needs Imaging Spectroscopy from Space	Tobias Hank
9:30-10:00	Mapping biochemical traits of forest stands: the importance of leaf-to-canopy scaling strategies	Joachim Hill
10:00-10:30	The factor scale in mapping urban environments with imaging spectroscopy data	Sebastian van der Linden
10:30-11:00	Coffee break	
Session 12	Modeling & simulation	Chair: Michael Schaepman
11:00-11:30	Inferring the invisible from the visible using models that combine radiative transfer with photochemistry in vegetation	Christiaan van der Tol
11:30-12:00	DART: recent advances in remote sensing data modeling with atmosphere, polarization and vegetation fluorescence	Jean-Philippe Gastellu-Etchegory
12:00-13:00	Lunch	
Session 13	Data processing & retrievals	Chair: Jose Moreno
13:00-13:30	From model simulations towards vegetation properties mapping: optimizing, simplifying and automating	Jochem Verrelst
13:30-14:00	Current scenario and challenges in the analysis of hyperspectral images	Lorenzo Bruzzone
Session 14	Synergistic use of spectroscopy & other observational approaches	Chair: Umberto del Bello
14:00-14:30	Synergistic use of imaging spectroscopy and laser scanning in forested ecosystems	Felix Morsdorf
14:30-15:00	Enhancing information content through fusion of imaging spectroscopy and multispectral data	Luis Guanter

15:00-15:30	Coffee break
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Session 15	In-situ measurements, validation schemes & spectral libraries	Chair: Andreas Müller
15:30-16:00	Building a Soil Spectral Library using a standard method at Lab and Field	Eyal Ben-Dor
16:00-16:30	Using spectral libraries for imaging spectroscopy analyses – the urban example	Uta Heiden
16:30-17:00	Upscaling local optical signals to global observations: Requirements for understanding and validation of Spaceborne Imaging spectroscopy products	Zbynek Malenovsky

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FRIDAY 25 NOVEMBER 2016

Session 16	Science traceability & uncertainty estimates	Chair: Michael Rast
09:00-09:30	Why Measuring Spectral Radiance? Science Traceability in Terrestrial Imaging Spectroscopy	Andreas Müller
09:30-10:00	Role of prelaunch characterization/calibration to ensure traceability of imaging spectroscopy missions	Kurtis Thome
10:00-10:30	Achieving high accuracy SI traceability in and from space	Nigel Fox

10:30-11:00	Coffee break
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Session 17	Concluding session	Chairs: Robert Green
11:00-13:00	Scientific advances & new challenges, societal benefits & operational perspectives, future requirements. Discussion about the “Space Sciences Series of ISSI” book (chapters, lead authors, review process and schedule)	All participants

END OF THE WORKSHOP