IAF EARTH OBSERVATION SYMPOSIUM (B1)
International Cooperation in Earth Observation Missions (1)

Author: Dr. Valentina Boccia
ESA - European Space Agency, Italy, valentina.boccia@esa.int

Dr. Marco Celesti
The Netherlands, Marco.Celesti@esa.int
Mr. Antonio Gabriele
ESA - European Space Agency, The Netherlands, Antonio.Gabriele@esa.int
Dr. Ferran Gascon
ESA - European Space Agency, Italy, Ferran.Gascon@esa.int
Dr. Robert Green
Jet Propulsion Laboratory - California Institute of Technology, United States, robert.o.green@jpl.nasa.gov
Mrs. Claudia Isola
ESA - European Space Agency, The Netherlands, Claudia.Isola@esa.int
Dr. Charles Miller
NASA Jet Propulsion Laboratory, United States, charles.e.miller@jpl.nasa.gov
Dr. Jens Nieke
ESA - European Space Agency, The Netherlands, jens.nieke@esa.int
Dr. Benjamin Poulter
National Aeronautics and Space Administration (NASA), Goddard Space Flight Center, United States, benjamin.poulter@nasa.gov
Dr. David S. Schimel
NASA Jet Propulsion Laboratory, United States, david.schimel@jpl.nasa.gov
Dr. Kurtis J. Thome
National Aeronautics and Space Administration (NASA), Goddard Space Flight Center, United States, kurtis.thome@nasa.gov
Dr. Philip A. Townsend
University of Wisconsin, United States, ptownsend@wisc.edu
Dr. Michael Rast
ESA - European Space Agency, Italy, Michael.Rast@issibern.ch
Dr. Jennifer Adams
Rhea for ESA, Italy, jennifer-susan.adams@geo.uzh.ch

NASA-ESA COOPERATION FOR EARTH OBSERVATION: THE SBG AND CHIME HYPERSPECTRAL MISSIONS

Abstract

The NASA-ESA cooperation on imaging spectroscopy space missions is part of the NASA-ESA Joint Programme Planning Group (JPPG) activities and seen as a priority for collaboration, specifically given the complementarity of mission objectives and measurement targets of the SBG and CHIME. Imaging spectroscopy has been identified by NASA, ESA, and other international space agencies as key to addressing a number of most important scientific and environmental management objectives. To achieve

the objectives outlined by the NASA's Decadal Survey in ecosystem science, hydrology and geology, and to implement the critical EU- and related policies for the management of natural resources, assets and benefits, high fidelity imaging spectroscopy data with global coverage and high spatial resolution are required. In order to answer to this shared international need, the ESA's CHIME (Copernicus Hyperspectral Imaging Mission for the Environment) and NASA's SBG (Surface Biology and Geology) satellite missions aim to provide imaging spectroscopy data at global coverage at regular intervals of time with high spatial resolution for visible to shortwave infrared (VSWIR) reflectances. The multi-mission and multi-Agency synergetic and cooperative approach currently in place for the development of SBG and CHIME ensures more global coverage spectroscopic observing systems with more rapid revisit time than any one agency's observing system can provide by itself. Therefore, the NASA and ESA teams have joined forces to address the logistical, algorithmic and calibration issues raised by harmonizing data across the two measurement programs, with the goal of providing research and applications communities with seamless high-level data products, effectively reducing the interval of time between usable observations significantly. An additional challenge comes from the volume and complexity of global, high spatial resolution, quasi-weekly data, and both teams are addressing the data science challenges of processing and merging heterogenous data at unprecedented scale. In this context, three Working Groups have been set up to outline the key areas of cooperation between the SBG and CHIME missions, and establish a roadmap for the implementation of cooperation: Data Products and Algorithms, Calibration/Validation, and End-to-End Modelling and Simulation. This contribution will present the aims and objectives of the NASA-ESA SBG-CHIME cooperation, and how it may benefit and enhance addressing CHIME and SBG's key scientific and environmental management objectives. The key areas of collaboration identified by each of the joint Working Groups, as well as the established roadmaps will be presented.