Paper ID: 25257
oral

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Ignition - Primary Space Education (1)

Author: Dr. Andreas Rienow
University of Bonn, Germany

Mr. Henryk Hodam
University of Bonn, Germany
Prof. Gunter Menz
University of Bonn, Germany
Mrs. Susan Runco
NASA, United States
Mr. Johannes Weppler
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

COLUMBUS EYE – HIGH DEFINITION EARTH VIEWING FROM THE ISS IN SECONDARY SCHOOLS

Abstract

In spring 2014, NASA will launch the High Definition Earth Viewing (HDEV) payload to the International Space Station (ISS). HDEV consists of four commercially available high definition (HD) cameras. It will be launched on a Dragon spacecraft and mounted to the ESA Columbus module by the station's robotic arm. Once installed, the cameras will cover three different perspectives: aft, forward, and nadir view. Hence, the HDEV payload offers the unique possibility of combining human space missions and earth observation into one outreach project. The German educational project "Columbus Eye", which is executed by the University of Bonn and is funded by the German Aerospace Center (DLR), aims at the implementation of the ISS live imagery and videos in a web portal, which will primarily serve as a learning portal for pupils of secondary schools. Interactive teaching materials will be provided on the portal. Based on the experiences of the project FIS (German for "Remote Sensing in Schools") and its learning portal (www.fis.uni-bonn.de/en), the material should motivate to work consciously with the HDEV footage in order to learn about curriculum relevant topics in the field of Science, Technology, Engineering, and Mathematics (STEM). Exhibiting a spatial resolution of 280 m and a temporal resolution of about 90 minutes, the HDEV data is well suitable of observing sudden and rapid changes and processes of the land surface and the atmosphere like volcano eruptions. Furthermore, a data archive will be developed, providing HDEV imagery free of charge via an open source web Geographic Information System (GIS). Columbus Eye will be accompanying the ISS mission of the German ESA astronaut Alexander Gerst (May to November 2014). A nationwide road show at German schools will link his mission and the fascinating bird's-eye view of the HDEV payload. The road show will involve an event during which pupils from a secondary school in North Rhine-Westphalia will talk to the astronaut via ham radio. Several live calls between pupils and the ISS are also contemplated. This paper presents the educational valorization of the HDEV footage for teachers, pupils and students. It will be shown which possibilities earth observation and human space missions provide for STEM education. The paper addresses the question of how characteristics of space missions can be used to enhance fascination of earth observation imagery in the light of problem-based learning in everyday school lessons for our global society.