SMALL SATELLITE MISSIONS SYMPOSIUM (B4)
Hitchhiking to the Moon (8)

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TIROSS - AN ACADEMIC SMALL SATELLITE PROGRAM FOR SCIENTIFIC EARTH-MOON SYSTEM INVESTIGATIONS

Abstract

TIROSS (Texas International Research and Operations in Space Science) is a science-driven program of Texas-based academic institutions and national and international partners in research and industry initiated in 2009/2010. Due to an agreement signed in 2007 between Baylor University and the Universitaet Stuttgart, the Center for Astrophysics, Space Physics and Engineering Research (CASPER) and the Institute of Space Systems (IRS) are collaborating in the field of space research and space technology applications.

The "Stuttgart Small Satellite Program" was initiated in 2002/03 at the Institute of Space Systems (IRS), Universitaet Stuttgart, Germany and consists of several small satellite missions. The program incorporates students (diploma/masters and PhD) and academic, research as well as industrial partners. The Lunar Mission BW1 is an academic small lunar orbiting satellite under development and implementation within the Universitaet Stuttgart, Germany. This lunar exploration and technology demonstration mission will perform both in-situ and remote sensing experiments with a planned scientific focus around particle, dust and meteoroid research. As part of a collaborative agreement between Baylor University and the Universitaet Stuttgart, CASPER is under consideration to contribute an instrument in the field of (dusty) plasma detector research to the scientific payload for investigations of the Earth-Moon system environment

CASPER and its partners are planning to develop a generic instrument based on their collective heritage and expertise to fly also on missions ranging from multi-unit cubesats to larger orbiters or landers. In addition CASPER and its partners consider to use an existing nano-satellite platform as a piggy-back sub-spacecraft for (dusty) plasma investigations in lunar or cis-lunar space. That sub-satellite will be able to fly on-board of Lunar Mission BW1 as well as on other spacecrafts to take advantage of available flight opportunities ranging from sub-orbital and Earth orbital tests and investigations to lunar orbit and surface missions. This paper will present and discuss the concept and elements of the program as well as results of concept studies.