

HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Utilization & Exploitation of Human Spaceflight Systems (3)

Author: Mr. Johannes Wepler
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

Prof. Mikhail Beliaev
S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
Dr. Olga Solomina
Institute of Geography of the Russian Academy of Sciences, Russian Federation
Prof. Martin Wikelski
Max-Planck-Institute for Ornithology, Germany
Dr. Walter Naumann
ICARUS Global Observation System GmbH (I-GOS), Germany
Mr. Wolfgang Pitz
SpaceTech GmbH, Germany

ICARUS - ANIMAL OBSERVATION FROM ISS

Abstract

Space missions have significantly increased the knowledge about our own planet. Remote sensing data deliver plentiful insights into a variety of fields, ranging from natural resources to human alteration of Earth's surface. Scientific missions probing our planet's atmosphere have widened our understanding of Earth's climate and the interdependencies that shape it. Space missions have also mapped the gravitational field of our planet to enable a deeper look into the heart of our home planet. Although scientific sensors and methods have dramatically increased in accuracy and resolution over the last five decades, some things are still hidden from these space observers: small animals. Innumerable numbers of animal species inhabit our ecosphere. Many of them are roaming the planet during their lifetime. Some (like birds) are doing it on a regular basis driven by the seasons; others wander in the search for food or to evade human harassment. Knowing more about the routes of these animals will not only improve the knowledge about their lives, but will also help to further the well-being of humans. Animal migrations can give hints to changes in the ecosystem that could also threaten human lives. For example there are strong indications that variations of animal behavior are linked to occurrence of natural disasters. The International Cooperation for Animal Research Using Space (ICARUS) is aiming to close this gap in the observation of our planet. Enabled by a cooperation agreement between the German Aerospace Center (DLR) and the Roscosmos, a team of scientists and engineers under the leadership of the Max-Planck-Institute for Ornithology is developing the ICARUS payload for the International Space Station ISS and the corresponding ground segment. The core element of ICARUS is the two way communication between the space and the ground segment. Miniaturized animal tags will gather data like GPS positions, acceleration and or local temperature. The tag mass of only five grams will enable the unprecedented observation of small animals. During an ISS overpass these tags transmit their data to the ICARUS antennae on the Russian segment of the ISS. The antennae can also relay commands to the tags deployed in the field. All scientific data will be made available on the Movebank internet application. It is currently planned to launch the ICARUS ISS payload in the fall of 2017. This paper will give an overview of the ICARUS system and the status of the technical development.