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NEWS RELEASE

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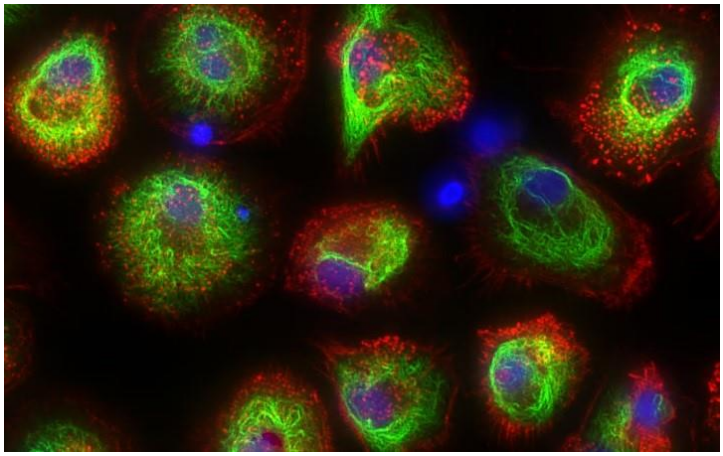
SPACE TANGO PARTNER AIRBUS LAUNCHING FLUMIAS-DEA TECHNOLOGY DEMONSTRATION ON SPACEX CRS-15

First Evaluation of Miniaturized Fluorescent Microscopy Providing 3-Dimensional Live-Cell Imaging Onboard the International Space Station

CAPE CANAVERAL, Fla. (June 29, 2018) – Space Tango announced today that a 7U CubeLab™ containing the FLUMIAS-DEA miniaturized fluorescent microscope developed by partner Airbus Defence and Space and TILL I.D. GmbH for the German Space Administration (DLR) is part of the Space Tango payloads launched on the SpaceX Commercial Resupply Services- 15 (CRS-15) mission from Cape Canaveral Florida at approximately 5:42 AM EDT this morning. This is the precursor to a more complex mission focused on expanding fluorescent microscopy capabilities for live-cell imaging onboard the International Space Station (ISS).

"In this technology demonstration, fixed and live cells will be evaluated with recorded images at well-defined intervals over a two-week period of cell-culture during the mission," said Rainer Treichel, Project Manager, Airbus Defence and Space GmbH, Germany. "FLUMIAS results from parabolic (24th DLR PFC) and sounding rocket (TEXUS 52) flights conducted by Space Biology and Life Sciences Professor Oliver Ullrich and Professor Daniela Gabriele Grimm have demonstrated the power of insights that can be gained from this technology in



FLUMIAS is a miniaturized high-resolution fluorescence microscope for live-cell imaging on ISS. It provides a view inside cells of the human body and other living things with high temporal and spatial resolution. For example, changes in metabolic processes, membrane dynamics and ion flows can be viewed in real time – changes, which are caused by the effect of changing gravitational conditions and microgravity. *Photo Credit: DLR*

microgravity and we look forward to the results from this long term space experiment, a first for the ISS."

"In addition to the ScienceBox partnership that we announced at the end of last year, we are very pleased to support DLR and Airbus in this technology demonstration and look forward to providing additional support for future efforts to establish this capability on station," explained CEO Twyman Clements. "This technology provides completely new insights into human tissues, cell cultures, microorganisms and plants. Working together with DLR and Airbus to successfully expand research capabilities on the ISS with tools like this, accelerates and expands the opportunities to conduct research on station that improves life on Earth."

Additional payloads accompanying FLUMIAS-DEA to low Earth orbit are STEM payloads from academic partners Higher Orbits and Magnitute.io carrying bees and microgreens, respectively, evaluating agricultural and manufacturing processes in space and on Earth.

Space Tango payloads launched for the CRS-15 missions to be installed on the ISS include:

PAYLOADS

Airbus Defence & Space

Flumias-DEA

PI: Prof. Dr. Oliver Ullrich, Otto-von-Guericke-University, Magdeburg, Germany
Co-I: Dr. Cora Thiel, University of Zürich, Switzerland
PM: Rainer Treichel

The mission objective of *Flumias-DEA* is to demonstrate the technology for miniaturized fluorescence microscopy in space by observing two scientific samples in a temperature-controlled environment. One sample is of fixed (dead) cells and the second sample is of live cells. It is a DLR precursor mission to pave the way for a much more complex mission in which results could provide a foundation for a scalable and powerful fluorescence microscope which provides 3D imaging of biological samples.

Higher Orbits

Megachile rotundata Proprioception and Flight Patterns in Microgravity

PI: Michelle Lucas

The objective of the *Megachile rotundata Proprioception and Flight Patterns in Microgravity* experiment is to observe the behavior and flight patterns of alfalfa leaf cutting bees (*Megachile Rotunda,* a.k.a. ALCB) in the microgravity environment. *M.*

Rotunda is an efficient pollinator though it is solitary and does not build colonies or store honey. Data to be examined during the life of the experiment includes flight patterns, feeding behavior (somatosensory functionality), proprioception, general locomotion, and any morphological changes. Better understanding the behavior and physiological changes of bees in space (for which ALCB provide an excellent baseline given their standard bee physiology) has practical application in the future of horticulture and agriculture on earth and in space. The experiment seeks to determine the effects of extraterrestrial conditions - including microgravity - on the flight and feeding patterns, proprioception, adaption, and lifespan of the *Megachile rotundata* Alfalfa Leaf Cutter Bee. The experiment has impacts on agricultural practices on Earth, in space, and beyond, as well as providing insight as to the impacts of earthbound forces on proprioception and orientation.

Magnitude.io

Growth of Assorted Microgreens in Microgravity

PI: Ted Tagami

The *Growth of Assorted Microgreens in Microgravity* studies the morphology and physiology of the germination of four different microgreens within modular growth chambers in microgravity. The seeds are placed under automatic growth lighting conditions to provide day and night lighting cycles that simulate successful terrestrial lighting. While imaging and numerous environmental sensors provide incremental evaluation of the plant growth on the International Space Station, multiple terrestrial control experiments will be conducted for comparison. The *Growth of Assorted Microgreens in Microgravity* experiment demonstrates modular, autonomous and retrievable crop research in space by contributing to the understanding of plant cultivation in service of food, oxygen and other habitat requirements on long term space missions. This experiment also provides insight on plant grown under unusual conditions and can inform crop science, basic biology and horticultural applications on Earth.

ABOUT SPACE TANGO

Space Tango designs, develops, and operates systems for bioengineering and manufacturing in the microgravity environment. Founded in 2014, Space Tango established their first operational TangoLab facility on the International Space Station in 2016 and a second facility in 2017. To date, Space Tango has flown nearly 50 diverse commercial, academic, and STEM payloads. As a recognized leader in the development of fully automated, remote-controlled systems for research and manufacturing in orbit, Space Tango continues to provide expertise in technology and scientific consulting related to working in microgravity for industry and academic

partners. Space Tango envisions a future where the next important breakthroughs in both technology and healthcare will occur off the planet creating a new global market 250 miles up in low Earth orbit. For more information, visit www.spacetango.com.

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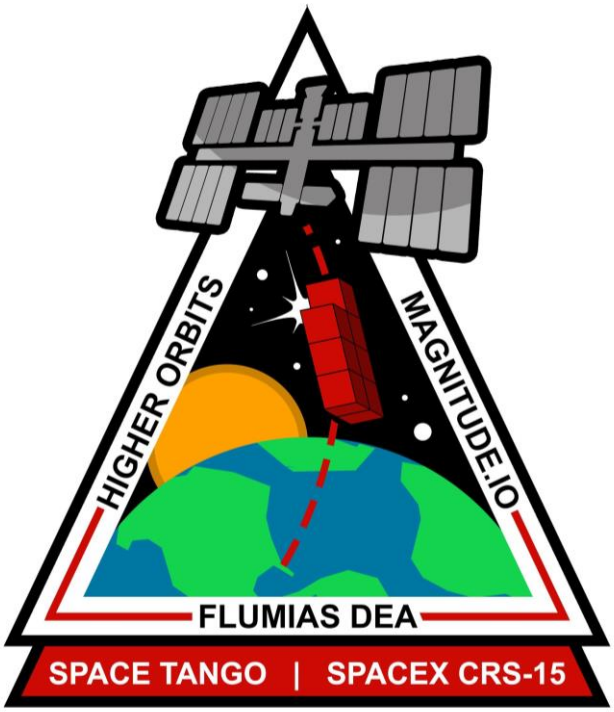

The official Space Tango CRS-15 mission patch.