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NEWS RELEASE

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SpaceX CRS-10 Successful Liftoff from Historical Launchpad 39A

Space Tango's First Step to Commercializing Microgravity Research

CAPE CANAVERAL, Fla. - SpaceX's Falcon 9 rocket successfully launched Space Tango payloads on Commercial Resupply Services - 10 (CRS-10) on February 19th approximately 9:39 AM EST. Payloads will be installed in the TangoLab Facility on the ISS. CRS-10 is Space Tango's first commercial opportunity to begin use of the facility hardware for researchers and customers to utilize microgravity for application on Earth.

"Our focus is not necessarily the six people up there," explained Space Tango CEO Twyman Clements, "but the 7 billion people down here."

Clements and his start-up company are working towards commercializing access to microgravity in order to expand the field of exomedicine and other research. The TangoLab facility allows Space Tango clients and partners to build high-performance and reliable experiments that can be designed and tested in microgravity.

"Space Tango is a leader of a rapidly growing entrepreneurial space industry in Kentucky," shared Kris Kimel, the Kentucky Science and Technology Corporation president and Space Tango chairman. The state of Kentucky continues to be a huge supporter in all of Space Tango's endeavors.

View the full hosted launch video here from SpaceX.

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PAYLOADS

> MMARS1

The Microbial Methane Associated Research Strasbourg No. 1 (MMARS1) flight experiment is a commercial experiment led by Airbus DS in collaboration with its scientific partners the International Space University and the University of Strasbourg. The purpose of this experiment is to study how a strain of methanogen, *Methanosarcina barkeri*, adapts to the stresses of the space environment, including microgravity and radiation, as a first step towards further studies related to relevant non-early applications of methanogen. Specifically, the goals of the MMARS1 experiment include: 1) to demonstrate the use or pressure measurements to estimate metabolic activity of *M. barkeri* and the overall experimental approach; 2) to investigate decoupling of metabolic activity from biomass production; and 3) to study the growth of *M. barkeri* using liquid
medium, including time of lag phase, growth rate, and time to stationary phase change under conditions of spaceflight.

> Contractile Properties of Smooth Muscle in Microgravity

The Contractile Properties of Smooth Muscle in Microgravity flight experiment is a research/educational experiment led by the Craft Academy in collaboration with its scientific partner - Morehead St. University - and its implementation partner Space Tango. The purpose of this experiment is to evaluate the involuntary cell contractions of aortic smooth muscle cells. Specifically, rat aorta smooth muscle cells - that show expression and pro-motor activity of several highly restricted smooth muscle cell markers - will be evaluated. The theory of contraction being proposed in this project is that the remodeling of the actin cytoskeleton, specifically that of a-action, is the contractile mechanism within smooth muscle cells, whereas the B-actin serves to maintain the cell's shape during contraction. If this contraction is observed in microgravity, then supporting or contradictory evidence of contractile cells and potential discoveries may be observed.

> ISSET Educational Endeavor No. 1

The International Space School Educational Trust (ISSET) works in partnership with some of the world's leading space organizations to deliver unique learning opportunities for students of all ages. For this project, ISSET has teamed up with the King's College London to perform three educational projects:

- ***Microbial Fuel Cell:***
  With space exploration aiming earnestly towards Mars, there are many ideas being discussed to help power the exploration and to utilize everything available within the spacecraft chosen. This experiment will show the usefulness of using microbes feeding on waste matter in a sealed environment to provide a power source to supplement the main fuel sources on the spacecraft.

- ***Cactus-Mediated Carbon Dioxide Removal in Microgravity:***
  In this experiment, the researcher is aiming to measure the oxygen output and the CO2 intake of a selected form of cactus. This is beneficial to the space station and space travel if CO2 removal/O2 production can be replicated and maintained safely in a microgravity environment.

- ***Activity of Mutated Drosophila in Microgravity:***
  In this experiment, the goal is to determine if there are any visible differences in flight between normal Drosophila flies and mutant Drosophila flies in microgravity. A terrestrial control version of the experiment will also be performed. The specific aim of the experiment is to identify if there are any positive differences in movement by placing the flies in a microgravity environment.

- ***Ionic Fluids as Lubricants in Microgravity***
  The purpose of this experiment is to evaluate the lubricant properties - ability to reduce friction - of 1-butyl-3-methylimidazolium chloride in microgravity. Friction will be generated by placing a motor-controlled wheel slide against a rough surface. Friction with and without the 1-butyl-3-methylimidazolium chloride lubricant will be measured.

> Medicinal Plants in Microgravity

The *Medicinal Plants in Microgravity* mission is a research experiment led by the Chappell Lab within the University of Kentucky. The purpose of this experiment is to uncover new chemistries provided through medicinal plants in a microgravity environment. Specifically, the research goal is to unlock novel genetic expressions of chemical capabilities of two plant types – valerian (*valeriana officinalis*) and periwinkle (*catharanthus roseus*). This experiment is divided into three phases: 1) establishing a baseline genetic guideline for medicinal plant seeds (non-germinated); 2) germinate medicinal plants in microgravity; and 3) multi-generational plant growth in microgravity that may encourage new gene expression.

> Life Cycle of Arabidopsis thaliana in Microgravity

The Arabidopsis thaliana flight experiment is an educational experiment led by Magnitude.IO. The purpose of this experiment is to study how the life cycle of Arabidopsis thaliana is affected by a microgravity environment. Specifically, the educational goals of this experiment include: 1) to successfully grow Arabidopsis thaliana in microgravity; 2) to evaluate the differences between microgravity and parallel terrestrial growth systems in classrooms; and 3) to preserve the seeds for future multi-generational microgravity growth studies.

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ABOUT SPACE TANGO

Space Tango designs and builds integrated systems that facilitates microgravity research and manufacturing focused for application on Earth. Their service allows users to focus on their research while Space Tango manages the complexities of traveling to and operating in microgravity. Space Tango's first product is the TangoLab-1, a fully automated system allowing multiple experiments to run simultaneously and independently. TangoLab-1 was installed on the International Space Station in mid-2016. Space Tango's vision only starts with TangoLab-1; Space Tango is developing an entire pipeline of products to increase the variety, volume and ease of using microgravity.

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RESOURCES

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