

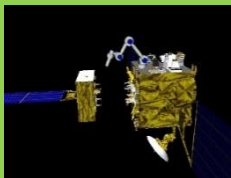
# The Space Robotics Laboratory

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This laboratory's primary research topics are dynamics and control for on-orbit servicing robots and lunar/planetary exploration rovers. We are also developing privately-funded lunar rovers for a real mission and university-designed micro-satellites.

## On-Orbit Servicing Robotics

We address dynamics and control of a space robot with manipulators. From the ETS-VII project in 1999, to the current HTV capture missions, we have engaged in various JAXA missions. For robotics in micro-gravity, we predicted the touch-down dynamics of "Hayabusa" and developed the exploration robot MINERVA-II2 for "Hayabusa2" mission.



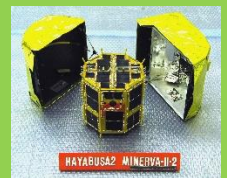
Flight Experiment of "ETS-VII" project



Touch-Down Dynamics for "Hayabusa" S/C



Dynamic Simulator for HTV Capture by Space Manipulator



MINERVA-II2 for "Hayabusa2" S/C

## Lunar/Planetary Exploration Robotics

To support tele-operation of lunar and planetary rovers, we focus on locomotion mechanics and motion control, and sensing and understanding of environments for, especially those with soft-soil and rough terrain. Furthermore, we are supporting the development of rovers for Japan's first privately-funded lunar mission.



Single Wheel Test Apparatus



Space Exploration Rover Test Bed "El-Dorado-II"



Field Experiment of Lunar Rover Model



Pre-Flight Model of HAKUTO's Lunar Rovers

## Micro-Satellite Engineering

To date, we have launched 7 micro-satellites and are developing four more. Our micro-satellite RISING-2 proved successful in best-in-class high-resolution spectral photography of the earth's surface. On campus, via our 2.4 meter parabolic antenna, every day we receive data from and send commands to on-orbit satellites



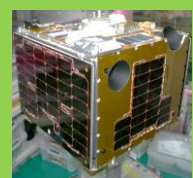
50kg-Class Micro-Satellite "RISING-2"



CubeSat released from ISS "RAIKO"



Parabolic Antenna of Ground Station



Latest 50kg-Class Micro-Satellite "RISESAT"