
Graduate Certificate in Space Law

Space Resource Utilization

Active Debris Removal (ADR): The process of removing defunct or non-functional satellites and other space debris from Earth's orbit to prevent collisions and reduce the risk of damage to operational spacecraft. Related terms include space debris and orbital debris. ADR is crucial for ensuring the long-term sustainability of space activities and reducing the risks associated with a congested space environment.

Cislunar Space: The region of space between the Earth and the Moon, encompassing all orbits and trajectories that can be reached by spacecraft launched from Earth. This region is of particular interest for future space exploration and development due to its proximity to Earth and its potential as a stepping stone for deeper space missions. Related terms include geostationary orbit and low Earth orbit.

Communications Satellite: A spacecraft that facilitates wireless communication between different points on Earth by transmitting and receiving signals via satellite dishes. These satellites are used for a variety of applications, including television and radio broadcasting, internet connectivity, and long-distance telephone calls. Related terms include satellite communication and global communications network.

Deep Space Mining: The extraction and processing of raw materials from celestial bodies, such as asteroids, comets, and moons, that are located beyond Earth's orbit. This field is of growing interest due to the potential for accessing valuable resources, such as water, precious metals, and rare earth elements, which can be used for various applications, including life support systems, rocket propellant, and high-tech manufacturing. Related terms include space mining and in-situ resource utilization.

Earth Observation Satellite: A spacecraft that collects data about the Earth's surface, atmosphere, and oceans by using sensors and cameras to capture images and measurements. These satellites are used for a variety of applications, including weather forecasting, natural disaster response, environmental monitoring, and military intelligence. Related terms include remote sensing and geospatial intelligence.

Geostationary Orbit (GEO): A circular orbit 35,786 kilometers above the Earth's equator, where a satellite appears to hover in a fixed position relative to the Earth's surface. This orbit is used for communications, weather, and remote sensing satellites due to its stability and wide coverage area. Related terms include Clarke Belt and satellite communication.

In-Situ Resource Utilization (ISRU): The practice of using resources available in the space environment, such as water, air, and raw materials, to support human life and spacecraft operations. ISRU can reduce the need for costly and risky resupply missions from Earth, and enable longer-duration space missions and the establishment of permanent human settlements in space. Related terms include space mining and deep space mining.

Low Earth Orbit (LEO): A region of space that extends from approximately 160 to 2,000 kilometers above the Earth's surface. This region is used for a variety of space activities, including Earth observation, remote

sensing, and satellite communication. Related terms include geostationary orbit and cislunar space.

Lunar Base: A permanent human settlement on the Moon, consisting of living quarters, laboratories, and support facilities. A lunar base would serve as a platform for scientific research, technological development, and resource extraction, and could serve as a stepping stone for future human missions to Mars and beyond. Related terms include lunar outpost and Moon village.

Orbital Debris: Any object in Earth's orbit that is no longer functional or serving a useful purpose, including defunct satellites, spent rocket stages, and fragments from satellite collisions and explosions. Orbital debris poses a significant risk to operational spacecraft and can hinder the safe and sustainable use of space. Related terms include Active Debris Removal and space debris.

Remote Sensing: The practice of collecting data about the Earth's surface, atmosphere, and oceans using sensors and cameras mounted on spacecraft, aircraft, or other platforms. Remote sensing enables the collection of information about hard-to-reach or inaccessible areas, and can support a wide range of applications, including weather forecasting, environmental monitoring, and military intelligence. Related terms include Earth observation satellite and geospatial intelligence.

Reusable Launch Vehicle: A launch vehicle that can be flown multiple times, reducing the cost and complexity of accessing space. Reusable launch vehicles have the potential to significantly lower the cost of space transportation and enable more frequent and routine space missions. Related terms include vertical takeoff, vertical landing and spaceplane.

Robotic Exploration: The use of unmanned spacecraft, such as rovers, landers, and orbiters, to conduct scientific research and technological development in space. Robotic exploration enables the collection of data and samples from remote and inhospitable environments, and can support a wide range of applications, including planetary science, resource extraction, and space weather monitoring. Related terms include unmanned space mission and autonomous spacecraft.

Satellite Communication: The use of satellites to facilitate wireless communication between different points on Earth. Satellite communication enables the transmission of voice, video, and data signals over long distances, and can support a wide range of applications, including television and radio broadcasting, internet connectivity, and long-distance telephone calls. Related terms include communications satellite and global communications network.

Space Debris: Any object in Earth's orbit that is no longer functional or serving a useful purpose, including defunct satellites, spent rocket stages, and fragments from satellite collisions and explosions. Space debris poses a significant risk to operational spacecraft and can hinder the safe and sustainable use of space. Related terms include orbital debris and Active Debris Removal.

Space Law: The body of law that governs the use and exploration of space, including the rights and responsibilities of states, international organizations, and private entities. Space law is based on a series of treaties, agreements, and principles, including the Outer Space Treaty, the Rescue Agreement, and the Liability Convention. Related terms include international space law and space governance.

Space Mining: The extraction and processing of raw materials from celestial bodies, such as asteroids, comets, and moons. Space mining is of growing interest due to the potential for accessing valuable resources, such as water, precious metals, and rare earth elements, which can be used for various applications, including life support systems, rocket propellant, and high-tech manufacturing. Related terms include deep space mining and In-Situ Resource Utilization.

Space Resource Utilization: The practice of using resources available in the space environment, such as water, air, and raw materials, to support human life and spacecraft operations. Space resource utilization can reduce the need for costly and risky resupply missions from Earth, and enable longer-duration space missions and the establishment of permanent human settlements in space. Related terms include In-Situ Resource Utilization and deep space mining.

Space Tourism: The practice of traveling to space for recreational or leisure purposes. Space tourism is a growing industry, with several companies, such as SpaceX, Blue Origin, and Virgin Galactic, offering suborbital and orbital flights for civilians. Related terms include commercial space travel and space traveler.

Spaceport: A facility for the launch and landing of spacecraft, including rockets, spaceplanes, and other types of space vehicles. Spaceports can be located on the ground, at sea, or in the air, and are used for a variety of space activities, including satellite deployment, scientific research, and space tourism. Related terms include