

## 4. Intellectual Rights & Space Activities- Science & Technology

Can international patent law handle a permanent presence in space?

The intersection of human space exploration and intellectual property (IP) represents a complex legal frontier. As space habitation moves from theoretical to practical, the "territorial" nature of patent law increasingly clashes with the "non-sovereign" and collaborative reality of outer space.

### The Core Conflict- Territoriality vs. Sovereignty-Free Space

**Earth-Based Patent Logic-** Patent systems are fundamentally territorial. Rights are granted and enforced within specific national borders. Infringement is determined based on where an invention is made or used.

**Space-Based Disruption-** International law (Outer Space Treaty, Article II) explicitly prohibits any nation from claiming sovereignty over celestial bodies like the Moon or Mars.

**Survival-Critical Innovation-** In space, innovation is not just for profit but for survival (e.g., life support, water recycling). Legal barriers to these technologies could endanger lives and mission continuity.

### The Current Legal Framework- "Jurisdiction-by-Registration"

Since space itself cannot be owned, international law creates a "legal fiction" to apply Earthly laws.

**Article VIII of the Outer Space Treaty-** Stipulates that legal jurisdiction follows the state of registry of a space object, rather than its physical location.

**The Registration Convention-** Reinforces that the "launching state" retains control and authority over the registered object.

**Extension of Domestic Law-** An invention made on a U.S.-registered module is legally treated as if it were made in U.S. territory. This "jurisdiction-by-registration" is currently the default governing method for space IP.

### Comparative Models of Space Jurisdiction

| Feature                        | International Space Station (ISS) Model                | Future Lunar/Martian Base Model                               |
|--------------------------------|--------------------------------------------------------|---------------------------------------------------------------|
| <b>Jurisdictional Boundary</b> | Module-by-Module- Defined by the contributing nation.  | Integrated/Shared- Blurry boundaries across shared platforms. |
| <b>IP Governance</b>           | Each module is national territory for IP purposes.     | Uncertain; multinational teams co-develop shared systems.     |
| <b>Structure</b>               | Static and segmented.                                  | Dynamic, mobile robots, and remote software updates.          |
| <b>Legal Certainty</b>         | High (defined by the ISS Intergovernmental Agreement). | Low (risk of contested or overlapping claims).                |

### Key International Legal Provisions

#### Outer Space Treaty (OST)-

- Article I- Space exploration must be for the benefit of all humankind.
- Article II- Prohibits national appropriation of celestial bodies.

#### Paris Convention (Article 5)-

- Temporary Presence Doctrine- Prevents patent enforcement on patented goods that are "in transit" (e.g., a ship in a foreign port).
- Space Application- It is currently unclear if this doctrine protects spacecraft docking at a foreign-registered station or transiting through various "jurisdictional modules."

### Critical Challenges and Emerging Issues

**De Facto Appropriation-** While nations cannot "own" the Moon, patents on essential survival technologies (energy, air, water) could create exclusive control, effectively functioning as a form of appropriation.

**The "Flags of Convenience" Risk-** Entities might register space objects in nations with weak patent enforcement (regulatory arbitrage) to evade legal claims while still benefiting from advanced technology.

**Fragmented Enforcement-** With no global "Space Patent Office," enforcement is a patchwork. Small nations often lack the power to shape these rules, remaining "rule-takers" in a system dominated by major spacefaring powers.

**The Collaboration Gap-** Patents prioritize the individual "inventor" or "state of registry," while space innovation is increasingly multinational and continuous, involving real-time refinements by diverse teams.

### The Way Forward

**Specialised International IP Framework-** There is a growing need for a space-specific legal regime that moves beyond strict territoriality toward functional or activity-based jurisdiction.

**Access-Oriented Limitations-** To align with the OST's mandate to benefit all humanity, the framework could include compulsory licensing or use-exceptions for technologies essential to safety and life support.

**Harmonization-** Strengthening the role of international bodies (like WIPO or the UN) to ensure that most countries are not left behind in the governance of extraterrestrial innovation.

**Source-** [https://epaper.thehindu.com/ccidist-ws/th/th\\_international/issues/168360/OPS/G52FFFCFF.1+GO9FGKKEC.1.html](https://epaper.thehindu.com/ccidist-ws/th/th_international/issues/168360/OPS/G52FFFCFF.1+GO9FGKKEC.1.html)

