

Space commercialisation and legal issues

Contemporary challenges in the new space era

Narayan Prasad

SPACE DEBRIS

Can we exactly say whose debris
is what?

How accurately can we track
debris?

If there are 2 different advisories,
whose advisory do we choose?

In case of harmful incidents, how
can we enforce liability?

Can anyone insure against debris
threat?

Who can pay for the clean up?

PRIVACY

Is it legal for someone to fly a drone over
my property to gather intelligence?

Then how is it legal that satellites of high resolution are allowed to gather that information and share it with anyone?

PNT

Jamming PNT signals

Scrambling PNT signals

CYBER SECURITY

A satellite is carrying propulsion system is hijacked to intentionally operate it to crash into another space asset

Signals are intercepted to monitor
communications or data

Intesat to deny LTTE satellite link

LTTE's television broadcasting to the outside world may suffer a major blow soon when it ceases to have the facility of using the Intelsat satellite, reports PK Balachandran.



By PK Balachandran | None, Colombo

UPDATED ON APR 14, 2007 11:23 AM IST

 **Hindustan Times**

The LTTE's television broadcasting to the outside world may suffer a major blow soon, when it ceases to have the facility of using the Intelsat satellite.

Following a plea made by Bernard Goonetilleke, Sri Lanka's Ambassador in the US, the Bermuda-based Intelsat said on April 11, that it did not tolerate terrorists or others operating illegally on its satellites.

"Since we first learned of the LTTE's piracy, we have been actively pursuing a number of technical alternatives to halt the transmissions. We are clear in our resolve to end this terrorist organisation's unauthorised use of our satellite," said Intelsat's General Counsel, Philip Spector, in a statement.

He said that unauthorised use of the satellite was a violation of US and Sri Lankan law. The US has designated the LTTE as a terrorist organisation.

According to the Spector, the LTTE has pirated an empty transponder frequency of their Satellite 12 for its broadcasts.



r00t
@r2x0t

Decoded this really cool video from [#SpaceX](#) [#Falcon9](#) 2nd stage S-band downlink. Great views of the Earth and also inside view of the fuel tank. Too bad it only transmits for 2 orbits or less. Thanks to the [@uhf_satcom](#) for the recording. We are pushing the boundaries yet again!



0:35 / 9:40

7:15 AM · Mar 11, 2021 · Twitter Web App



How Amateur Radio Fans Decoded SpaceX's Telemetry & Engineering Video

521,662 views · 15 Mar 2021

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Scott Manley ✓
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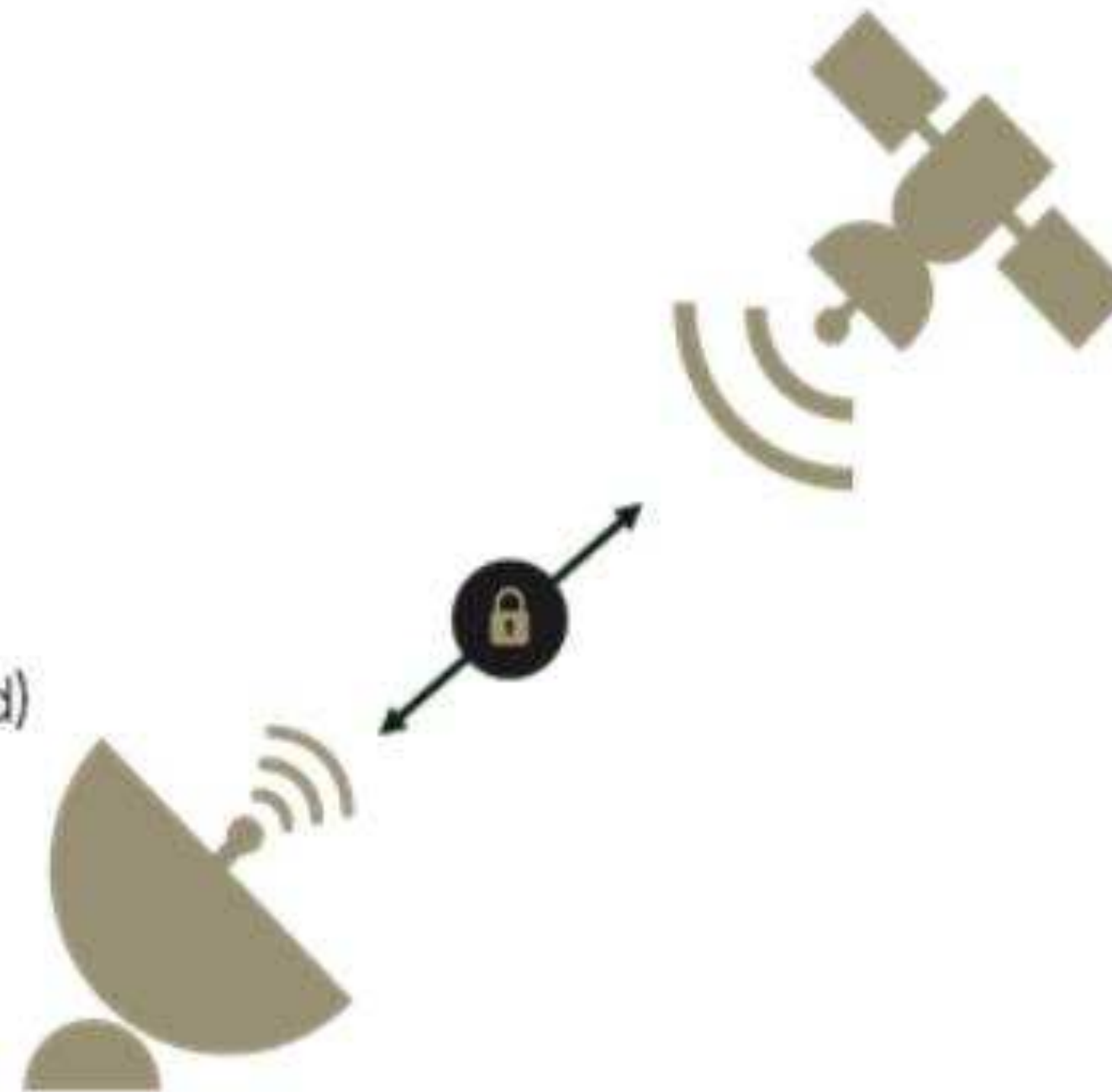
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Over the weekend amateur radio tinkerers in Europe managed to decode some portions of the telemetry data broadcast by the second stage of the Falcon 9 when it's in orbit. This data was in a somewhat standard format, but decoding still required some custom tools to extract the bitstream

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ON GROUND

1. Encryption of uplink (TTC or payload)
2. Decryption of downlink (TTC or payload)
3. Authentication of satellites, ground stations, etc.
4. Signature of software updates for reconfiguration
5. Secure key management lifecycle



ON BOARD

1. Decryption of uplink (TTC or payload)
2. Encryption downlink (TTC or payload)
3. Authentication of ground segment and other satellites when needed
4. Verification of signature and secure update process
5. Secure key management lifecycle

LIKELIHOOD



Space Mining

Space Resource Exploration and Utilization Act of 2015

From Wikipedia, the free encyclopedia



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Find sources: "Space Resource Exploration and Utilization Act of 2015" – [news](#) · [newspapers](#) · [books](#) · [scholar](#) · [JSTOR](#) (March 2018) (*[Learn how and when to remove this template message](#)*)

The **Space Resource Exploration and Utilization Act of 2015** ([H.R. 1508](#)) was a bill (which never became law) introduced in the [114th Congress](#) of the U.S. on March 19, 2015, by Rep. [Bill Posey](#), [Republican](#) of [Florida](#). It is identical to the Senate bill by the same name ([S. 976](#)). The bill expands Presidential power regarding space resources, and regulates US-based space exploration companies. It expired at the end of the Congressional session without a vote in the full House or Senate.

It allows the President to "facilitate the commercial exploration and utilization of space resources to meet national needs", and "promote the right of U.S. commercial entities to explore outer space and utilize space resources, in accordance with such obligations, free from harmful interference, and to transfer or sell such resources".^[1] It also allows the President to make recommendations to Congress regarding exploration and utilization of space resources, and declares property rights for entities that obtain "asteroid resources". The bill also states that a US commercial space company cannot cause harmful interference or "bring a civil action in a U.S. district court for any action by another entity subject to U.S. jurisdiction causing harmful interference to its operations with respect to an asteroid resource utilization activity in outer space".

Luxembourg adopts space resources law

by Jeff Foust — July 17, 2017

WASHINGTON — The government of Luxembourg has passed a bill giving companies the rights to space resources they extract from asteroids or other celestial bodies.

The parliament of Luxembourg, a unicameral body known as the Chamber of Deputies, voted 55 to 2 in favor of the space resources law July 13. Passage of the bill means the act will become law on Aug. 1.

“Luxembourg is the first adopter in Europe of a legal and regulatory framework recognizing that space resources are capable of being owned by private companies,” Étienne Schneider, deputy prime minister and minister of the economy, said in a statement. “The Grand Duchy thus reinforces its position as a European hub for the exploration and use of space resources.”

Russia Slams Trump's Space Mining Order

By [MINING.com](#) - Apr 11, 2020, 4:00 PM CDT



Russia's space agency Roscosmos has condemned US President Donald Trump's [order signed this week](#), which encourages citizens to mine the moon and other celestial bodies with commercial purposes.

The government body likened the policy to colonialism and said it "hardly sets the countries to fruitful cooperation."

"There have already been examples in history when one country decided to start seizing territories in its interest — everyone remembers what came of it," Roscosmos' deputy general director for international cooperation, Sergey Saveliev, [said in a statement](#).

The entrepreneurial approach contaminates space law

- Encouragement of private investment
- by adopting adequate regulatory frameworks to encourage emerging markets
 - E.g. U.S. Commercial Space Launch Amendment Act of 2004 = US commercial suborbital industry (7 main service providers; 4 launch sites)
 - French Taskforce on “suborbital aircrafts” (2015 – 2016)
- by granting property rights
 - 2015 Space Resource Exploration and Utilization Act - facilitate the commercial exploration for and commercial recovery of space resources by U.S. citizens
 - 2016 Luxembourg’s Asteroid Mining Plan

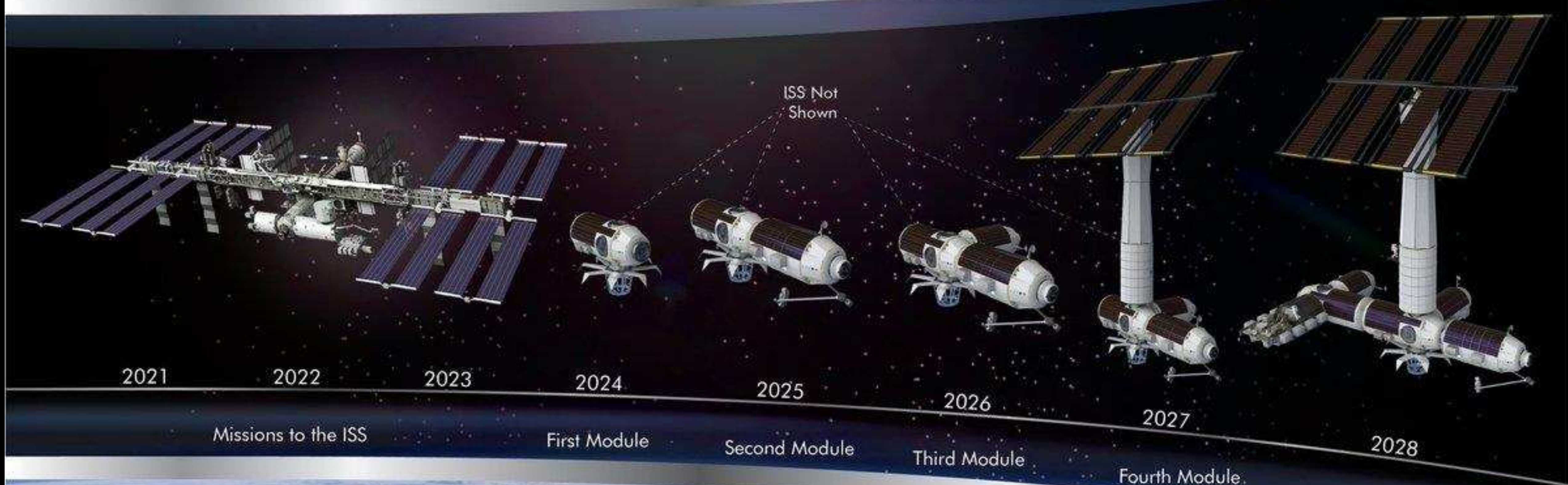
Space Tourism

B. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space

The Contracting Parties,

Noting the great importance of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies,¹ which calls for the rendering of all possible assistance to astronauts in the event of accident, distress or emergency landing, the prompt and safe return of astronauts, and the return of objects launched into outer space,

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