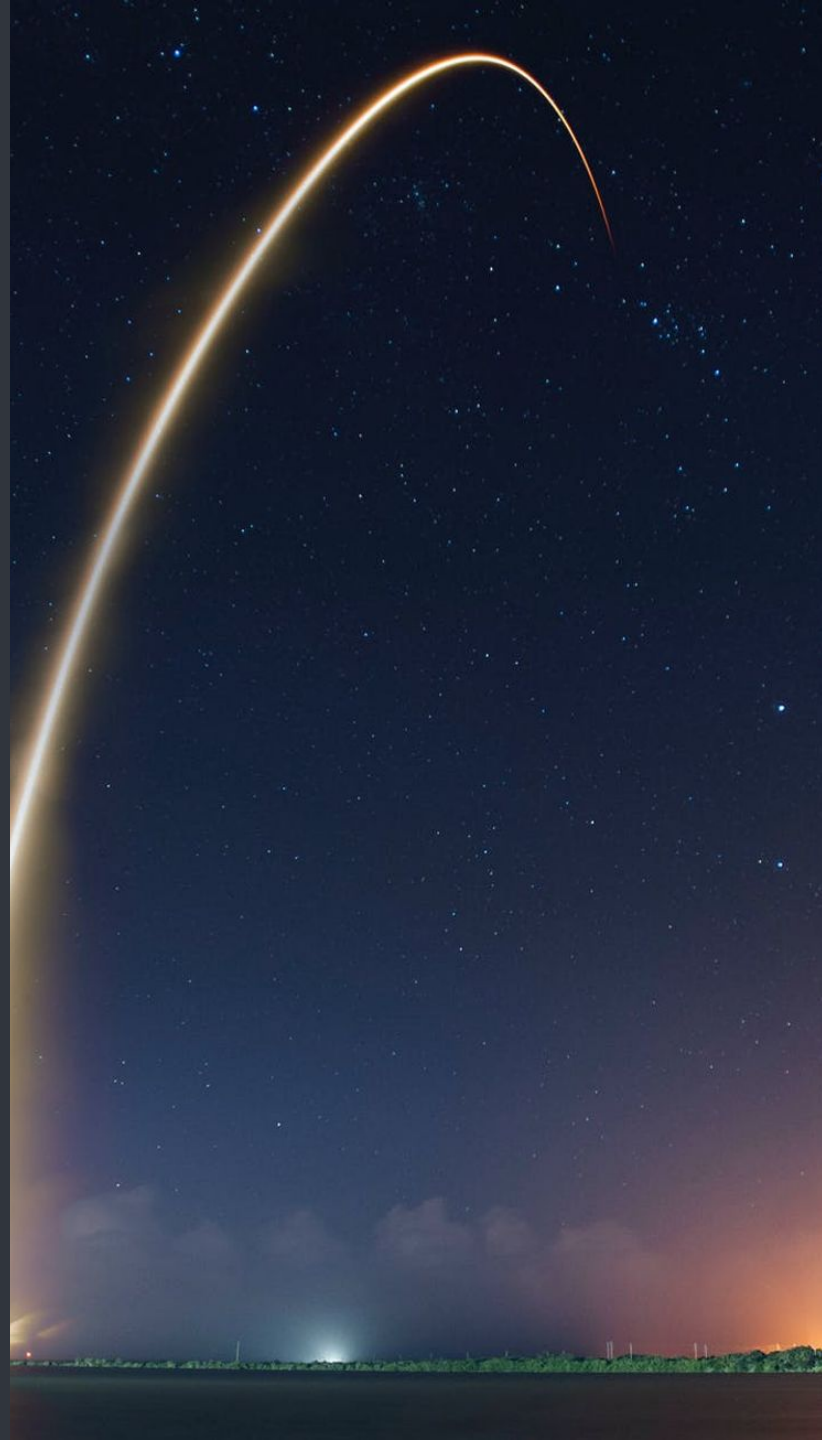
ARBITRATION LAB | LONDON SUMMER ARBITRATION SCHOOL | 20 JUNE 2024

Outer Space Arbitration

Dr Gerardine Goh Escolar
Professor (Adj)
Faculty of Law | National University of Singapore



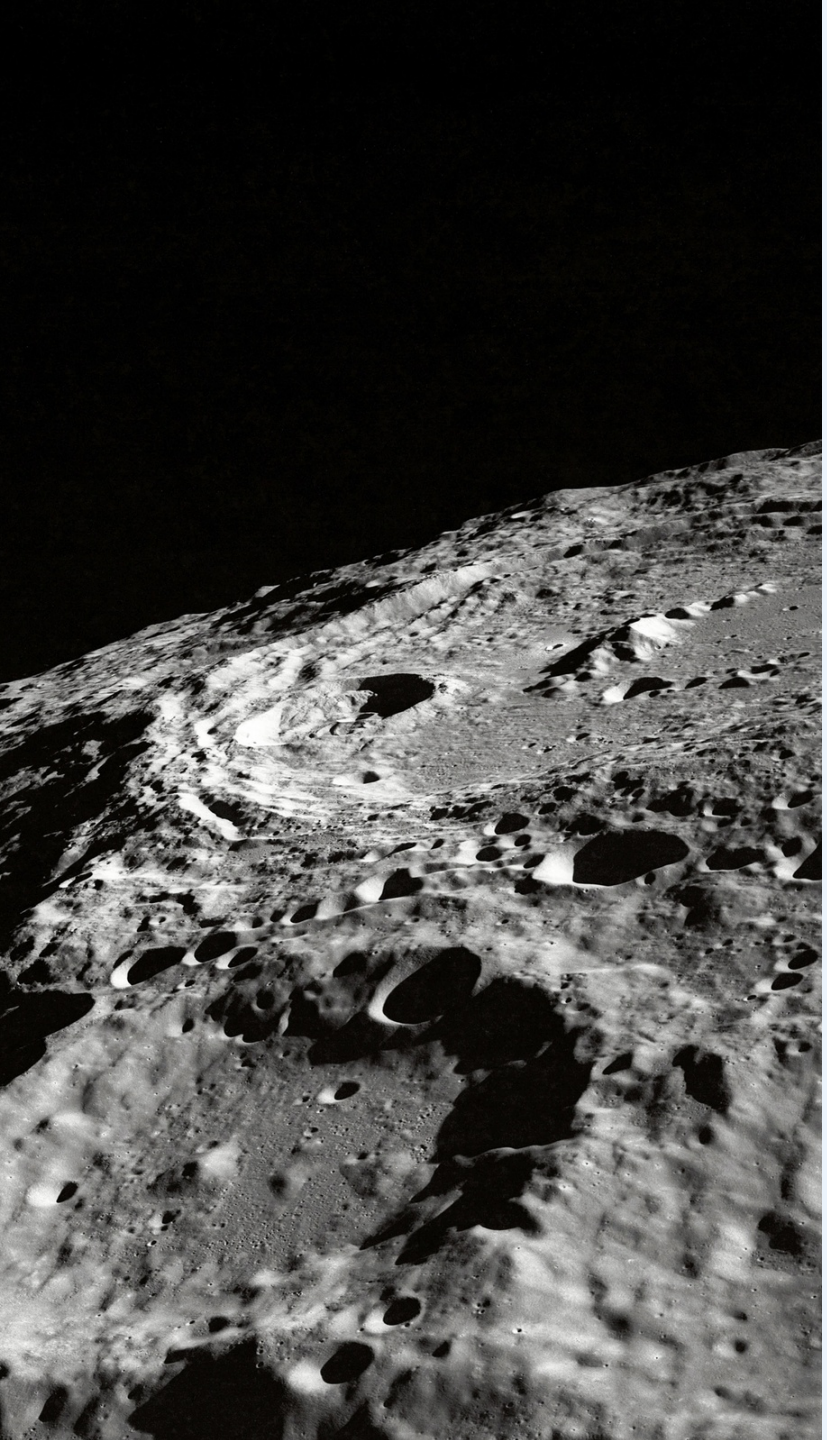

space.
the final frontier

Are you for or against the exploration of outer space?

For

Against

Undecided



Are you for or against the use of resources in outer space?

- For
- For, but only if it benefits everyone
- Against, unless it benefits everyone
- Against
- Undecided

What most intrigues you about the use and exploration of outer space?

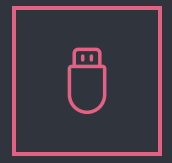
Human spaceflight: I have always wanted to be an astronaut!

Military Uses: Space Force, Jedis and the Dark Side of the Force

Resources: Microgravity manufacturing, meteorite mining, solar energy

Earth observation: The use of space technology to protect the environment of the Earth

Scientific Missions: To boldly go and discover the origins of the Universe



Spin-offs: The things that we learnt in space make tons of money on Earth (e.g. Velcro, Teflon)

Telecommunications: Mobile phones, satellite links for internet, and direct broadcasting

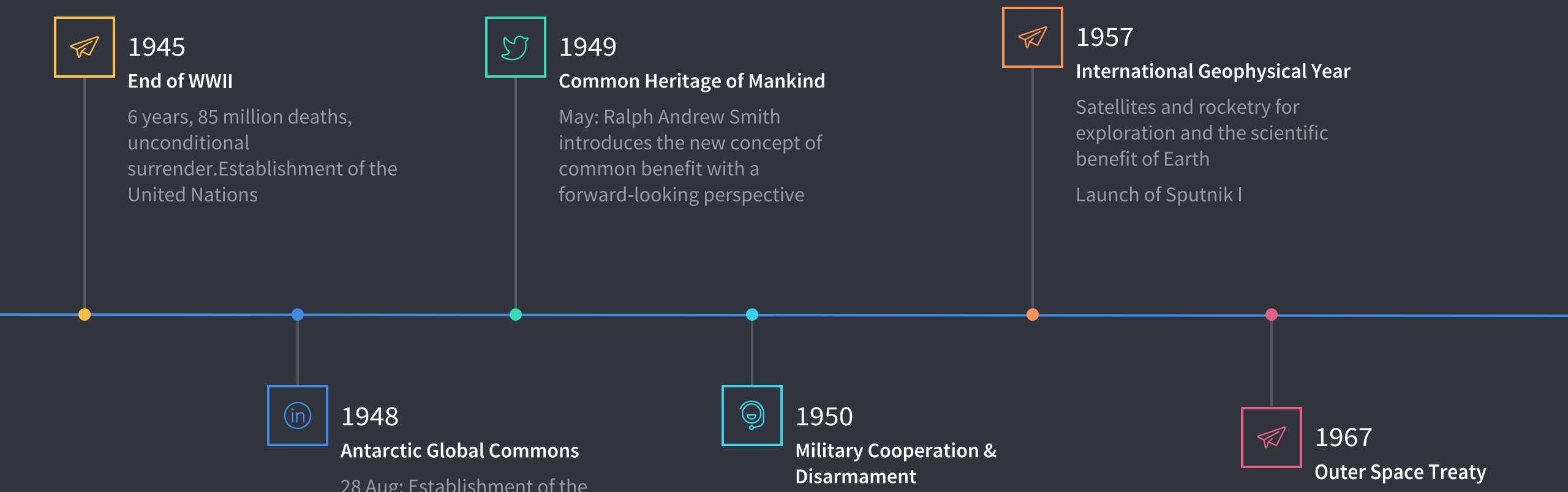
SETI: The Search for Extraterrestrial Intelligence

International Cooperation: Transparency and Confidence Building, international projects


CONFERENCE ON DISARMAMENT
SPACE ADVENTURES LOCKHEED MARTIN
SCALED COMPOSITES
THE STARSHIP COMPANY BIGELOW AEROSPACE
BLUE ORIGIN
KNOWLEDGE MANAGEMENT
VIRGIN ORBIT
STATE RESPONSIBILITY
ROCKETLAB
UNCOPUOS
ARIANESPACE
INSPIRATIONAL
SEA LAUNCH
UNOOSA
NORTHRUP GRUNMAN
JURISDICTION
SPACE RESOURCES
BOEING
CSA
LIABILITY
ASI
INNOVATIVE
SPACEX
NUCLEAR POWER SOURCES
USSF
COMMERCIALISATION
NEAR-EARTH OBJECTS
SOVEREIGNTY
SPACE ASSETS
ASA
COMMUNITY
CUTTING EDGE
NASA
TRANSPARENCY
DLR
SITUATIONAL AWARENESS
ISRO
INTA
EARTH OBSERVATION
INTERNATIONAL SPACE LAW
SSAU
CNES
QKD
ICAE
ESA
CNSA
DIRECT BROADCASTING
DE-WEAPONISATION
NON-APPROPRIATION
RULE OF LAW
DISPUTE SETTLEMENT
MICROSAT CONSTELLATIONS
ISA
NEWSPACE
COMMON HERITAGE
CONTROL
APSCO
SPACE GOVERNANCE
TRANSPORT OPERATIONS
CONTAMINATION
TELECOMMUNICATIONS
JAXA
SOURCES
AIRBUS ORBITAL
HUMAN SPACEFLIGHT
VIRGIN GALACTIC
SUSTAINABLE
DUE REGARD
FIREFLY
SIERRA NEVADA
ROSCOSMOS
MINING
DUAL-USE
MILITARY USE
EADS ASTRIUM
CONFIDENCE-BUILDING MEASURES
SPACE EXPLORATION
ZERO2INFINITY
INTERNATIONAL COOPERATION
EXCALIBUR ALMAZ
SPACE TRAFFIC MANAGEMENT
DEEP SPACE INDUSTRIES
ENVIRONMENTAL PROTECTION


how
did we get here?

Context: Origins of Human Activity in Outer Space



1945
End of WWII
6 years, 85 million deaths, unconditional surrender.Establishment of the United Nations

1948
Antarctic Global Commons
28 Aug: Establishment of the world's first area of res communis

1949
Common Heritage of Mankind
May: Ralph Andrew Smith introduces the new concept of common benefit with a forward-looking perspective

1950
Military Cooperation & Disarmament
21 July: UK-US Agreement regarding the establishment of a high altitude interceptor range for guided missiles

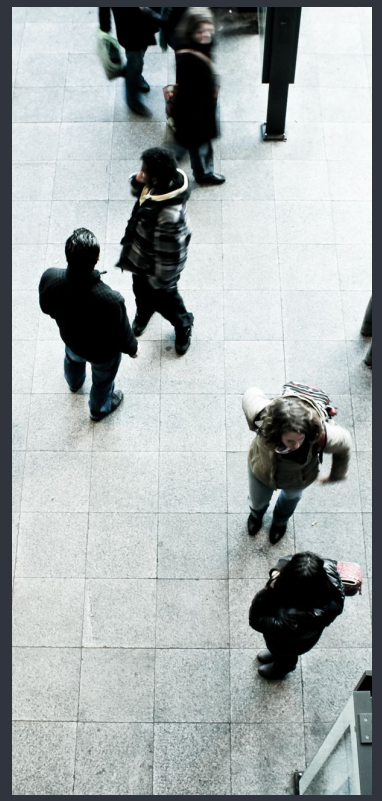
1957
International Geophysical Year
Satellites and rocketry for exploration and the scientific benefit of Earth
Launch of Sputnik I

1967
Outer Space Treaty

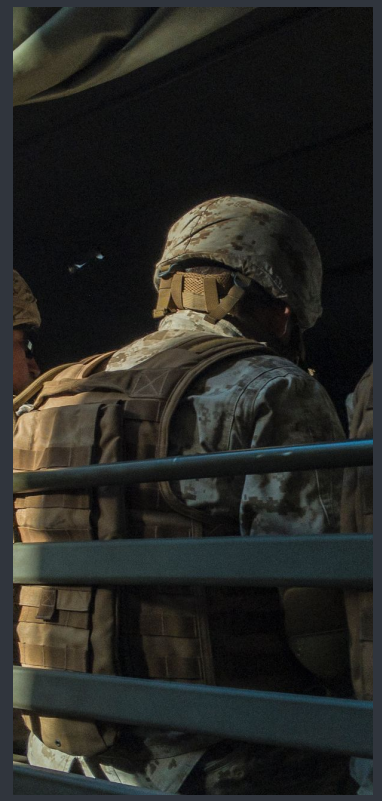
Actors and Context

International Geopolitics

Space Environment, Science & Technology



Proliferation of Different Actors



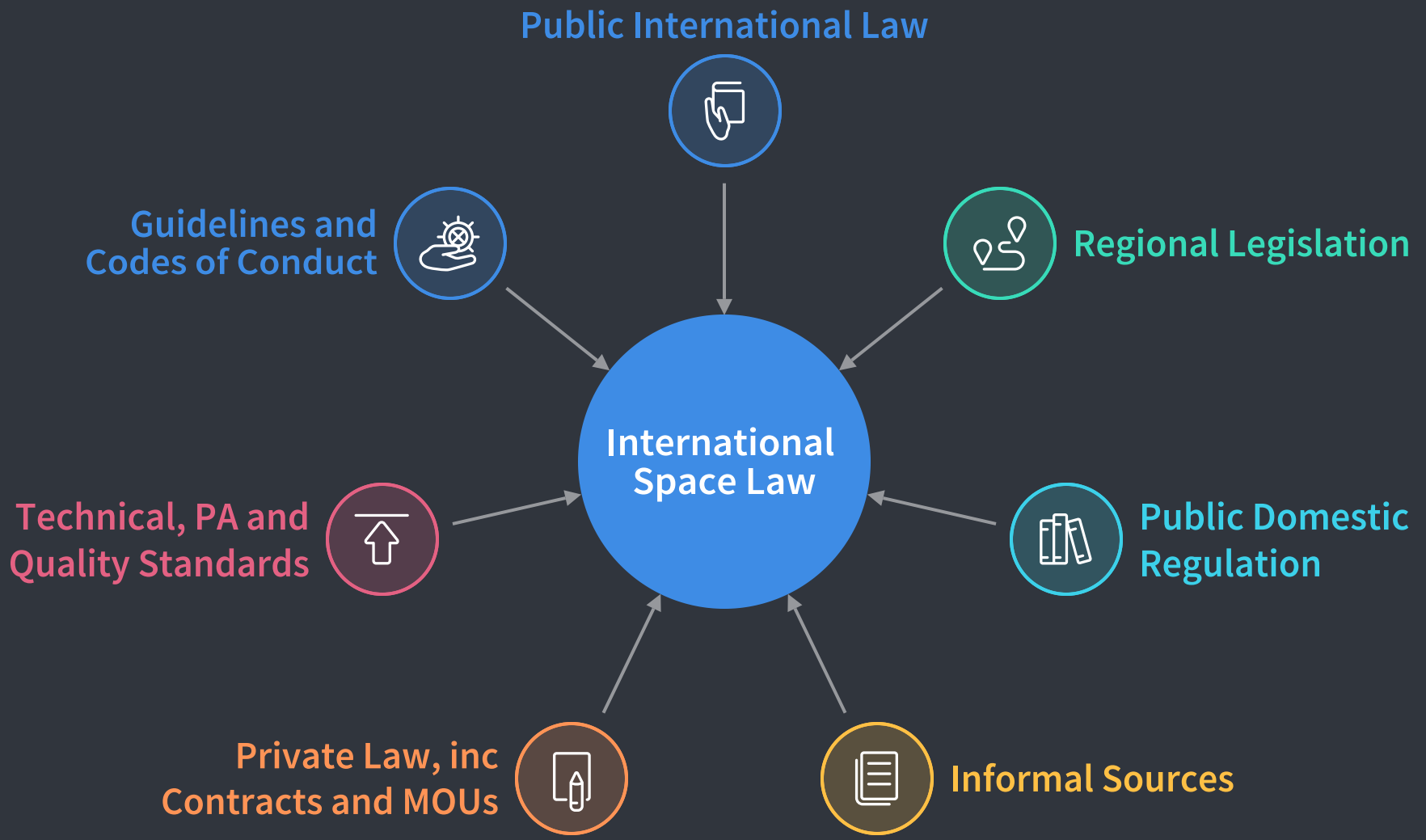
Military Uses and Dual Use

Commercialisation

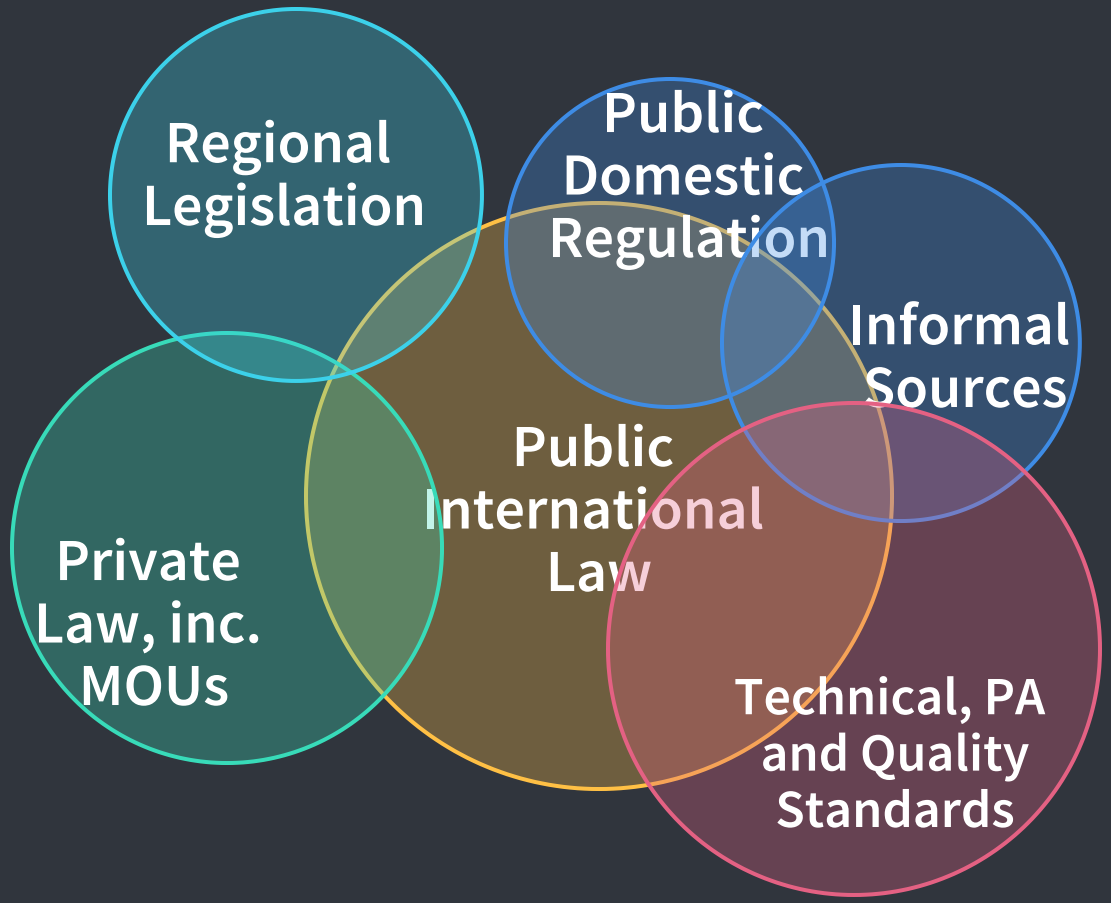
Enforcement and Verification


what
is the legal framework governing
human activities in outer space?

What is space law?



Sources of Law



The Public International Space Law Ecosystem

UN General Assembly Resolutions

Contracts & Commercial Agreements

Recommendations & Codes of Conduct

Technical Standards

Policies

Developments?

Conventions

Custom

General principles of law

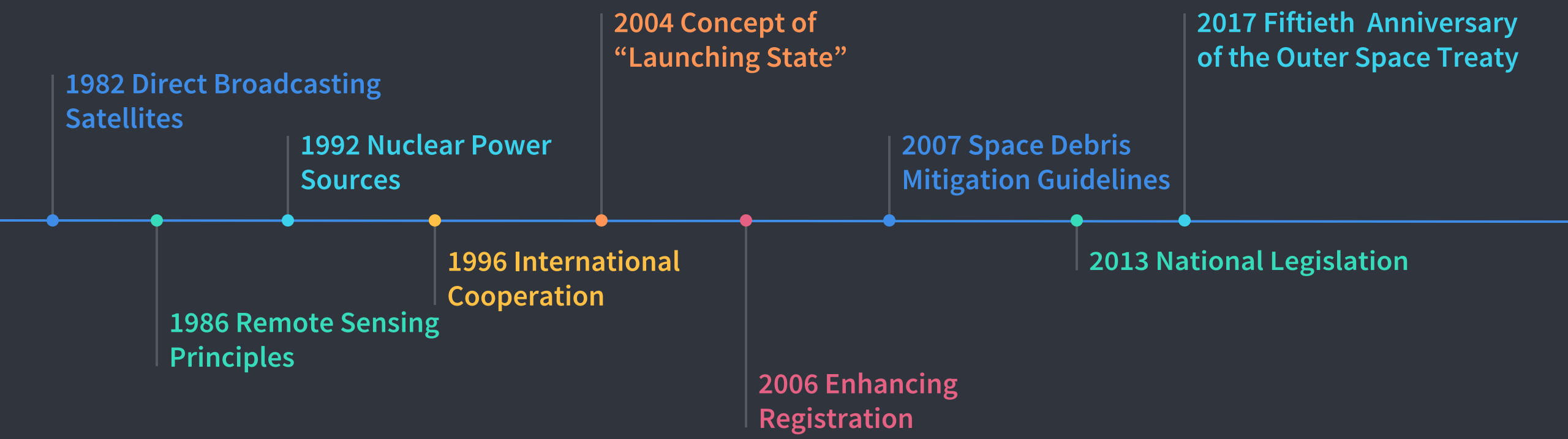
Judicial Decisions & Publicists

Public International Law

Treaties

1. **1967 Outer Space Treaty**
   Framework principles of international space law
2. **1968 Rescue Agreement**
   Focus on rescue and return of astronauts
3. **1972 Liability Convention**
   Ultra hazardous nature of space activities
4. **1975 Registration Convention**
   Answering the question of jurisdiction and control
5. **1979 Moon Agreement**
   Exploring and exploiting the resources of Earth's closest neighbour
6. **Other Bilateral, Multilateral and Regional Conventions**

United Nations General Assembly Resolutions



Basic Principles of International Space Law

Freedom of Exploration and Use

State Responsibility: *sui generis* scheme

Due Regard and Harmful Contamination

Non-Appropriation

Liability for Damage

Peaceful Purposes

Jurisdiction and Control

Peaceful Means of Dispute Settlement

Astronauts as Envoys of Mankind


developments
in the space sector

Trends in the Global Space Economy

TECHNOLOGICAL ADVANCES CREATING EXPECTATIONS OF MORE COST-EFFECTIVE SPACE ACTIVITIES

INCREASED PRIVATE INVESTMENT BY INVESTORS NEW TO SPACE

MILITARY AND STRATEGIC DEVELOPMENTS AROUND SPACE AS A CROWDED AND VALUABLE HIGH GROUND

Realisation that commercialization can achieve “better, cheaper, faster” access to space

Increasingly widely-shared vision of space as transformative for humanity

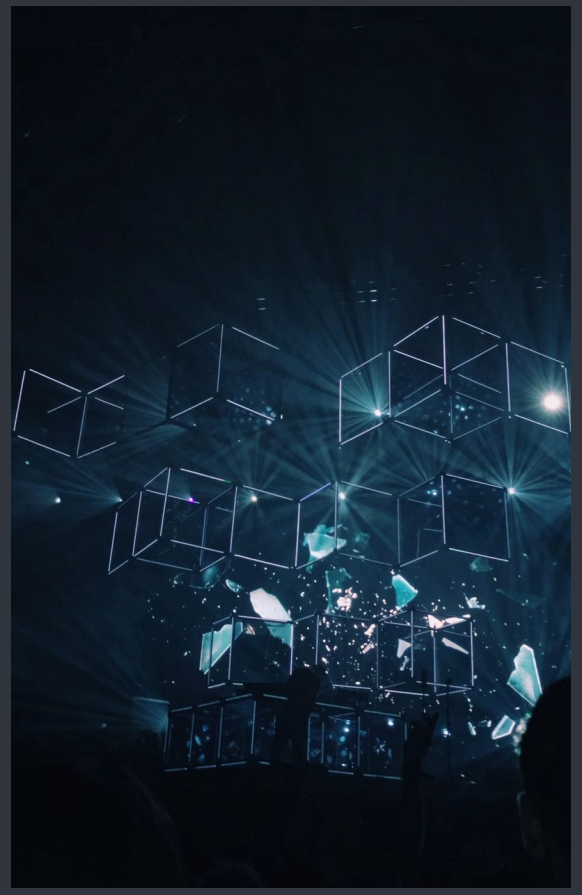
Growing awareness of environmental and other concerns faced by the Earth environment

A global economy that is increasingly data dependent with diverse effects on space capabilities and markets


400B
Size of the global space economy in 2023

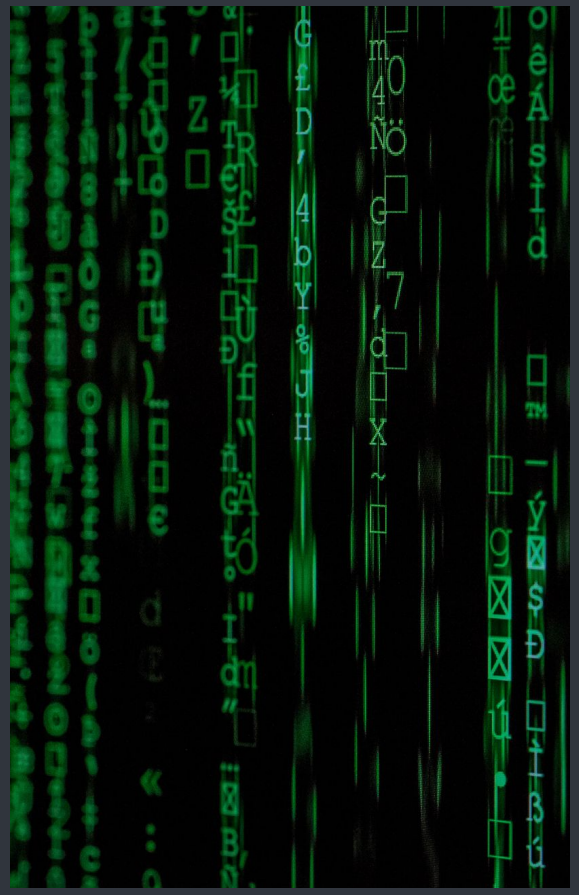
The size of the global space economy in 2020 was USD$385 billion.
The space economy is forecast to grow to **USD$1 trillion in 2040**.

Military Uses of Outer Space



Outer Space as a Military Theatre

Law of Armed Conflict in Outer Space

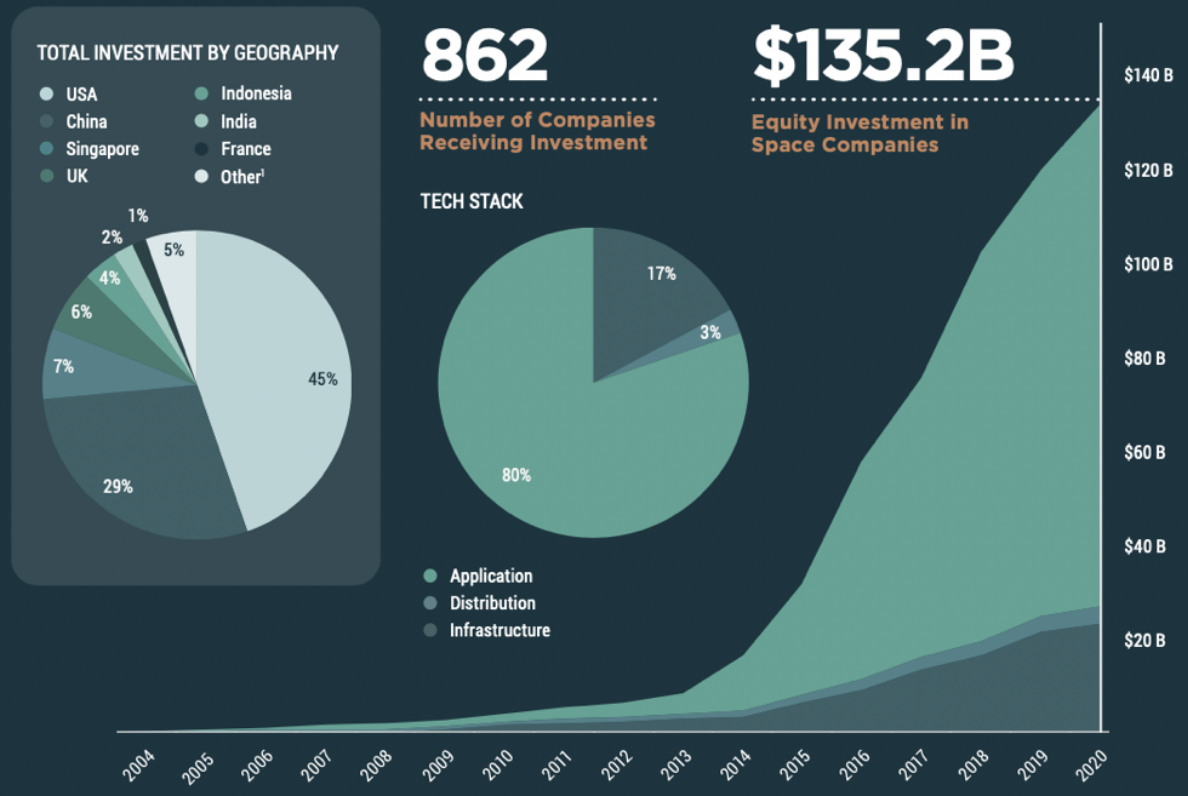


Transfer of Military-Grade Technology

Disarmament and Arms Control

Rise of the Space Startups

CUMULATIVE EQUITY INVESTMENT FROM 2004 TO PRESENT



1978
NAVSTAR I GPS launched

1984
First Commercial GPS Receivers

2001
gpsOne supports launch of GPS on mobile devices

2005
Google Maps launched

2008
iPhone 3G equipped with GPS

2009
SpaceX first successful commercial launch

2012
SpaceX Dragon first private space vehicle to berth with ISS

2015
SpaceX lands orbital booster, ushers in reusability

2017
Planet Labs images entire Earth daily

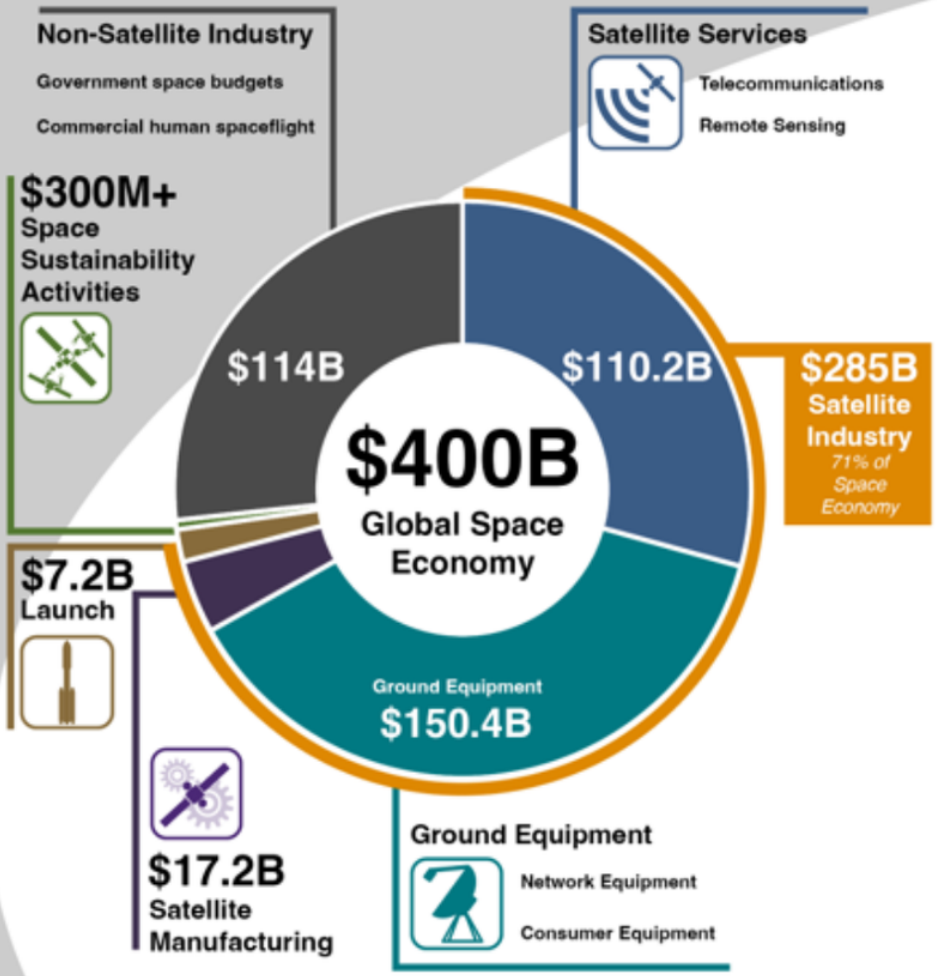
2018
China shows QKD via satellite

2023 Global Satellite Industry Revenues

SIA

The Satellite Industry in Context

(2023 revenues worldwide in billions of U.S. dollars)



Prepared by:

BRYCE TECH

Satellite Services

2023 Revenues: $110.2B

Consumer	$88.8B

Satellite TV (DBS/DTH)
Satellite Radio (DARS)
Satellite End-User Broadband

Enterprise	$18.2B

Transponder Agreements
Managed Services Over FSS Bands
Mobile Voice and Data Over MSS Bands

Remote Sensing	$3.2B

Ground Equipment

2023 Revenues: $150.4B

$18.2B Consumer Equipment (Satellite TV dishes, etc.)

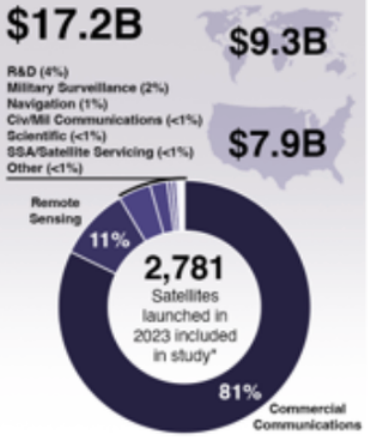
$115.5B GNSS Equipment (GNSS devices/chipsets)

GPS

$16.7B Network Equipment (VSATs, gateways, etc.)

Satellite Manufacturing

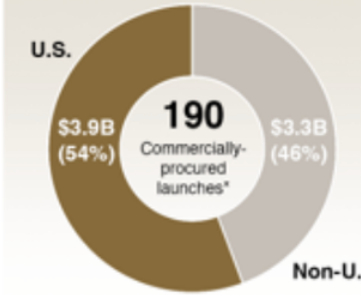
2023 Revenues: $17.2B



Satellites Launched by Mission Type

Launch Industry

2023 Revenues: $7.2B



* 190 commercially procured launches from 221 total orbital.

Commercial Launch Revenues by Region

Changing Industry Dynamics: Increasing Affordability and Productivity, New Capabilities

Satellite Manufacturing
- Improved capability, innovative application of smallsats
- New applications, new models
- More capable, lower cost GEO satellites

Launch
- Increased launch activity
- Changing launch landscape

Satellite Services
- Massive telecom constellations of smallsats delivering service
- More GEO satcom capacity enabling new services
- More commercial remote sensing choices, capabilities

Space Sustainability Activities
- Debris removal
- Moving satellites
- Life extension
- SSA
- Servicing
- In-orbit assembly

New satellite activities contributing to in-orbit sustainability

Ground Segment
- Growing on-the-move connectivity
- Broadband, satellite radio installations on the rise
- Sat to cellphone capability deploying
- 5.6B GNSS satellite-enabled smartphones, other devices
- Television viewership changing from traditional models

Changing industry dynamics provide increased end user benefits
- Increasing productivity
- Increasing affordability
- New capabilities
- New space sustainability concepts
- Greater resiliency
- Economic growth

End Users

Consumer, industry, government, and non-profits

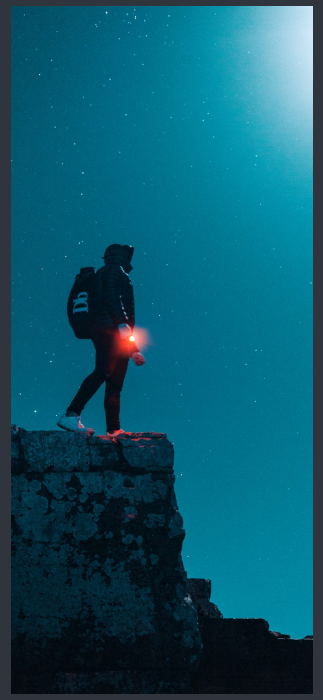
All sectors of the economy

Global

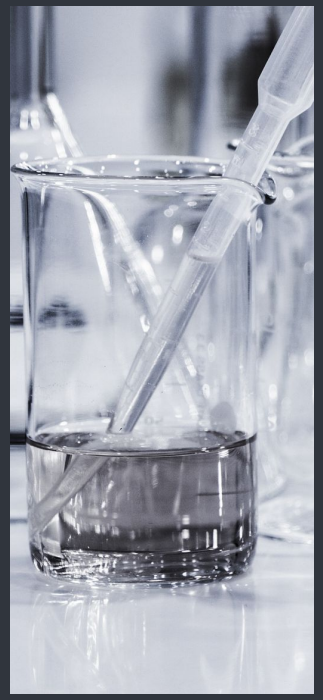
Rise of the Space Start-ups: Sectors currently attracting investment

Reusable launch vehicles

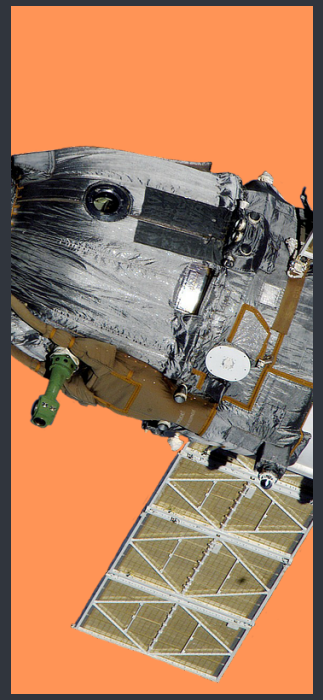
Situational awareness



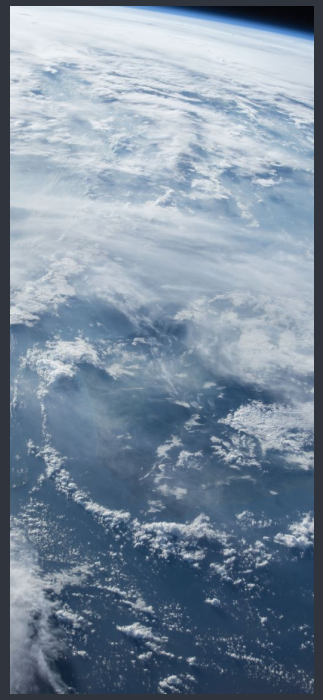
Space tourism and transport



In-space research and manufacturing



Smallsat, infrastructure and platform manufacturing

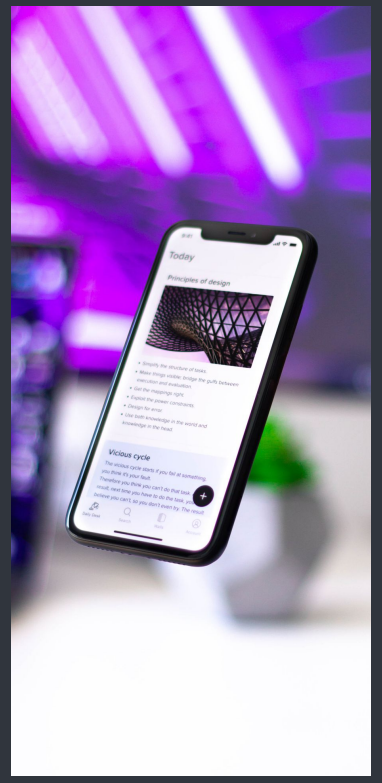


Satellite servicing

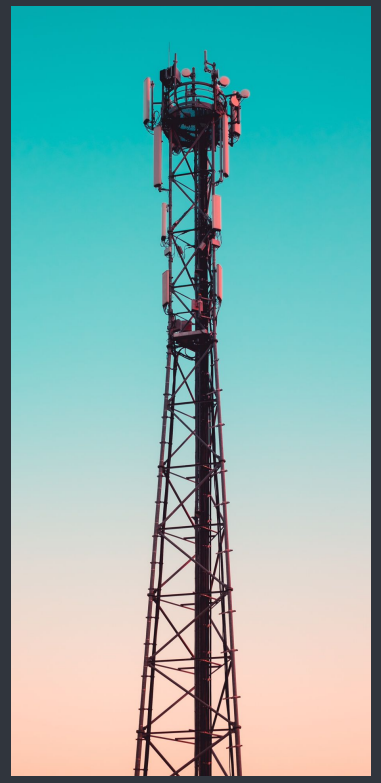
Space mining / resource utilisation


sectors
in the newspace economy

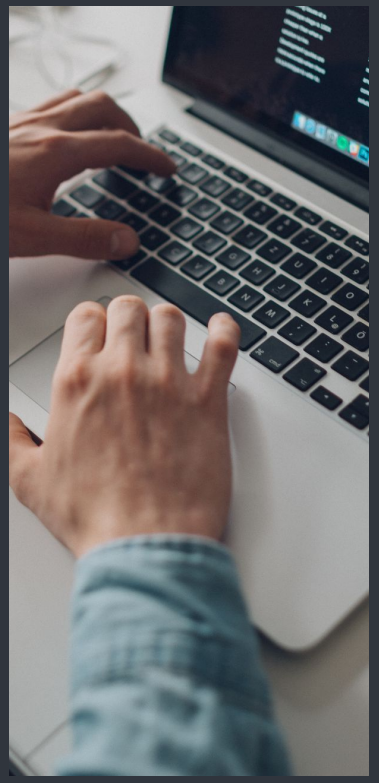
Satellite Applications



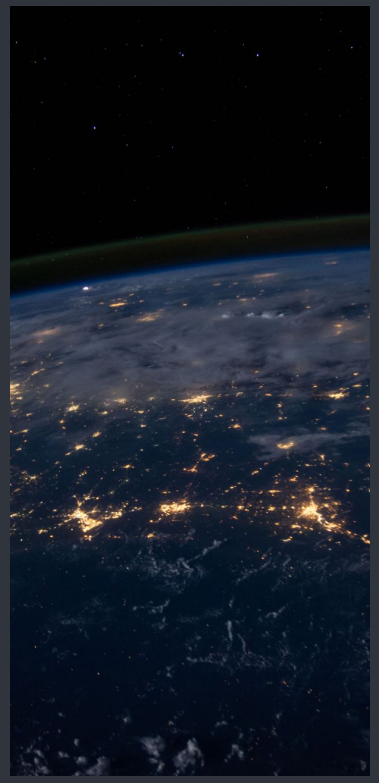
Telecoms



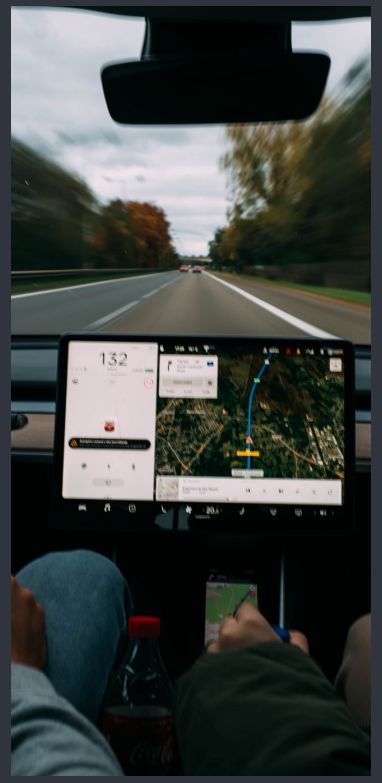
Direct Broadcasting



Connectivity and Internet of Things



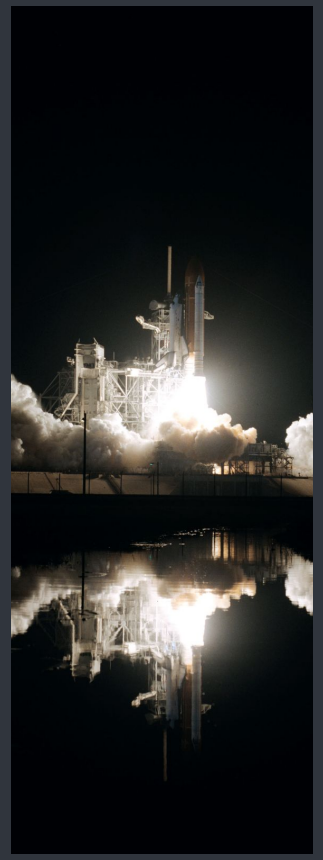
Earth Observation



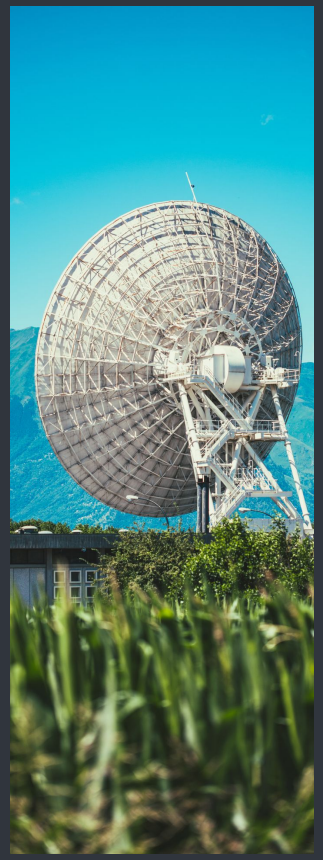
Global Navigation and Location-Based Services

Science, Weather and Informational Networks

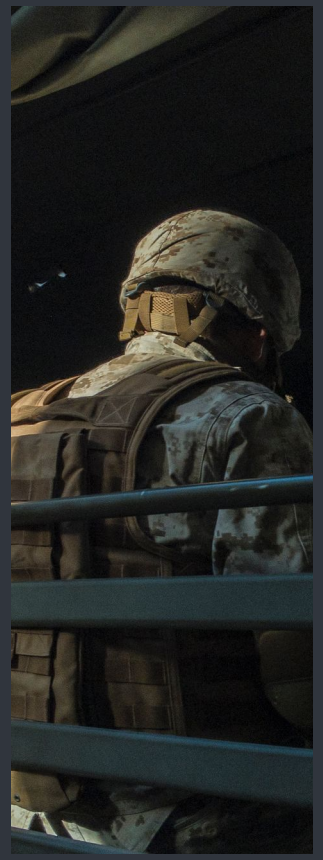
Sectors with Long-term Growth Potential



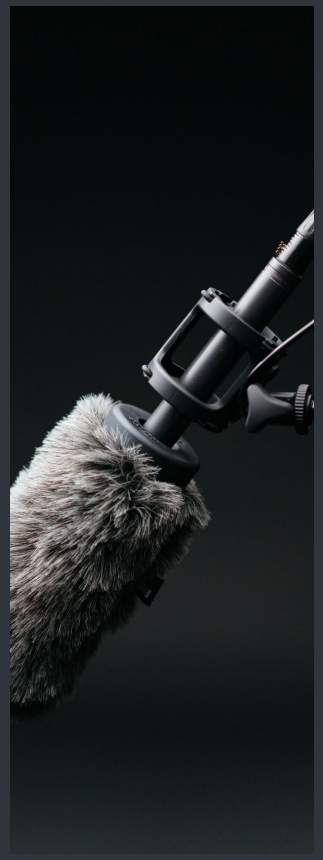
Launch facilities and services



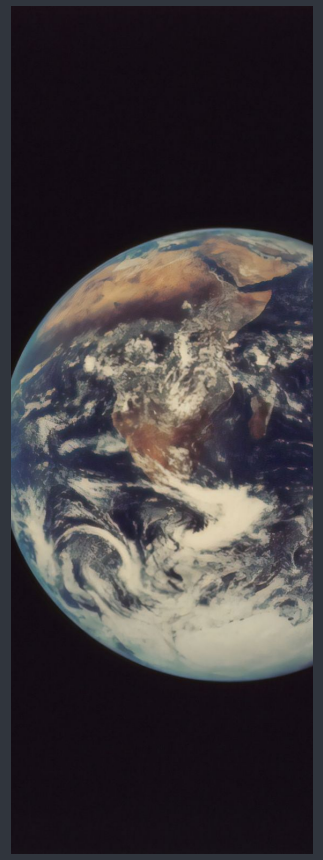
Smallsat manufacturing



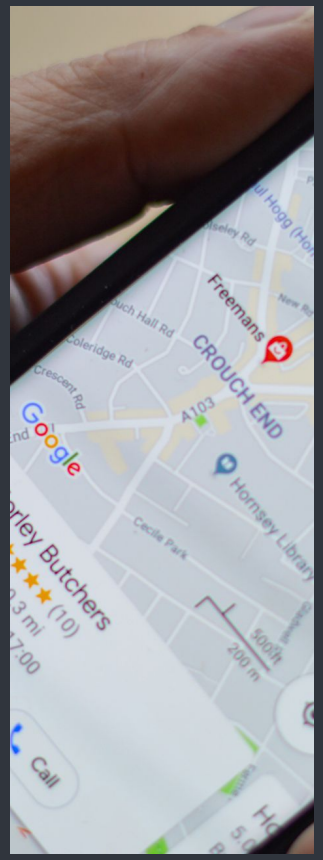
Military, defence and security



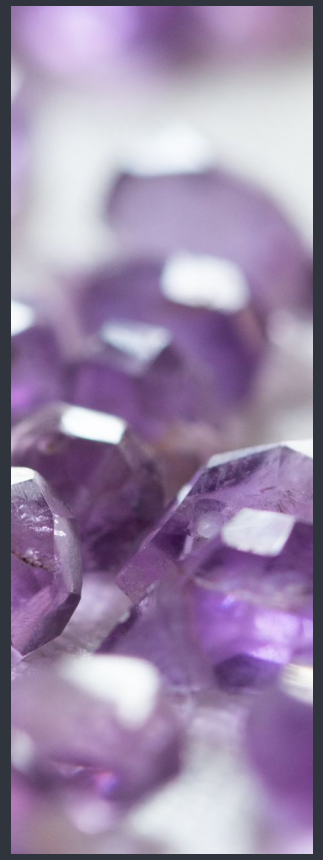
Consumer broadband and satellite radio



EO-driven data analytics

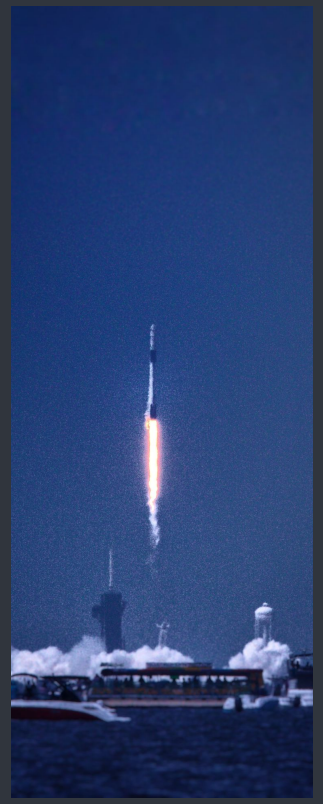


Navigation and location-based apps

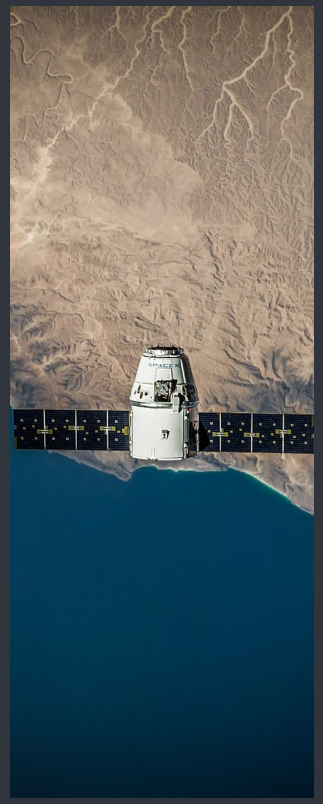


Space mining

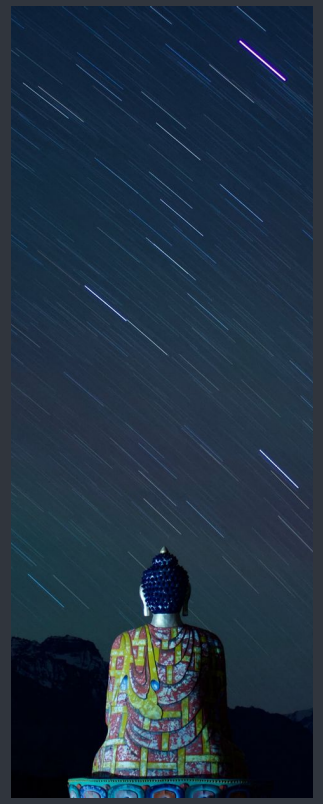
Sectors Attracting Investment



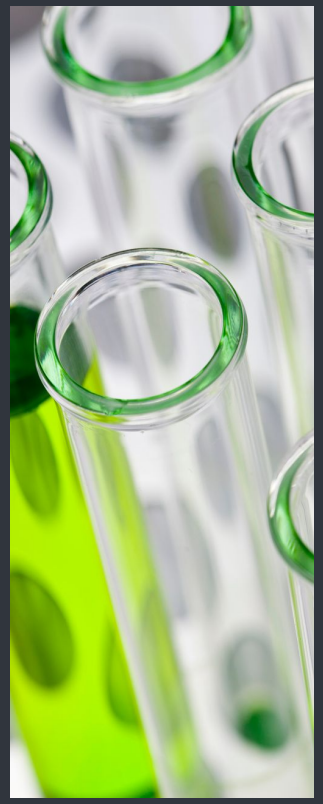
Reusable launch vehicles



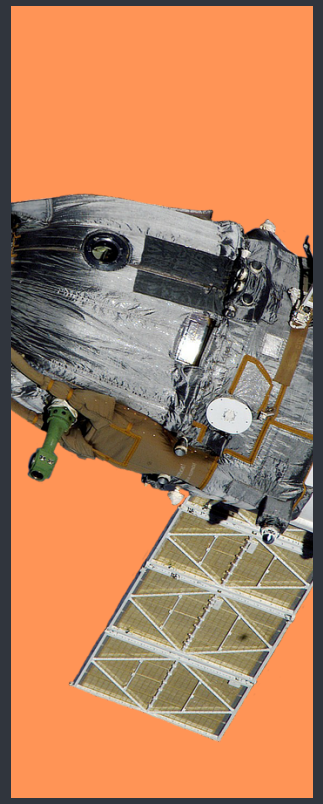
Situational awareness



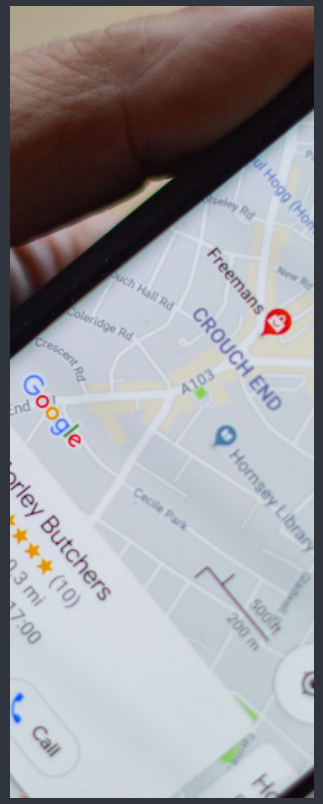
Space tourism and transport



In-space research and manufacturing



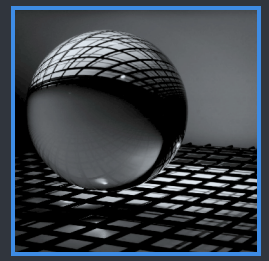
Smallsat, infrastructure and platform manufacturing



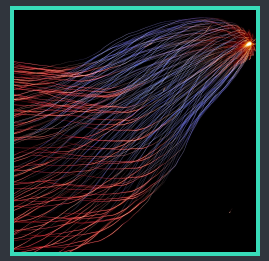
Satellite servicing

Space mining / resource utilisation

What else is new?



Quantum Comms



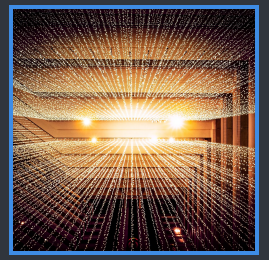
Distributed Ledger Tech (DLT)

Dark Skies

Mega-Constellations

On-Orbit Manufacturing

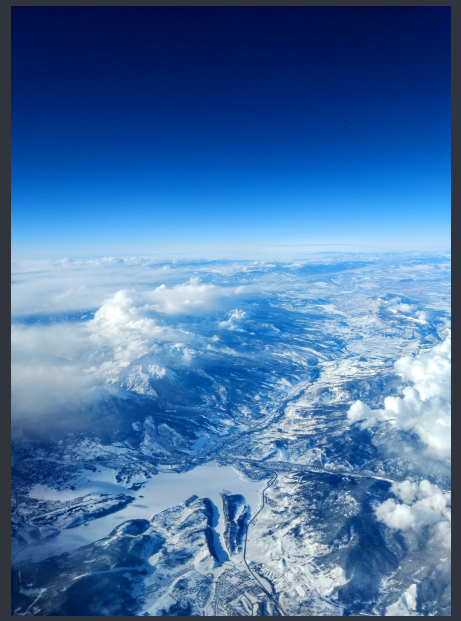
Human Presence in Space



Hyper-accurate Data Provision

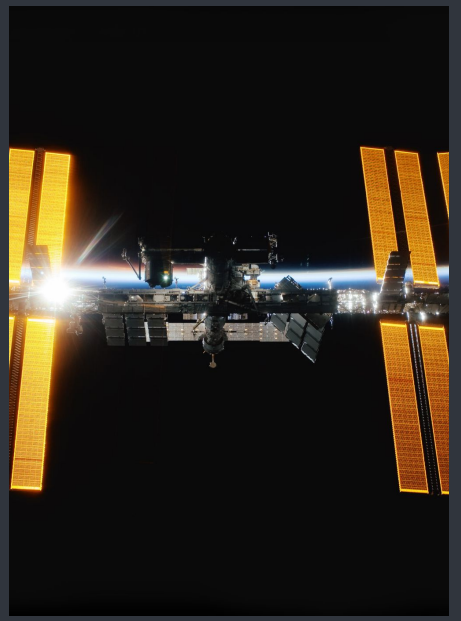
Artemis Accords

Environmental Protection and Situational Awareness



Due Regard & Environmental Protection

Minimum international standards
Due regard and appropriate measures

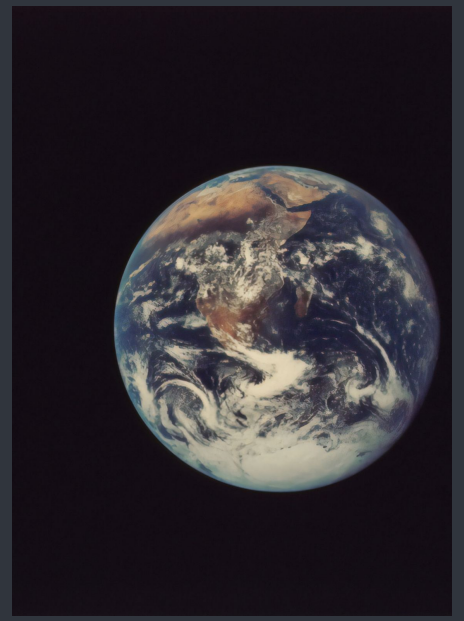


Orbital Debris

The Problem
Mitigation
Remediation

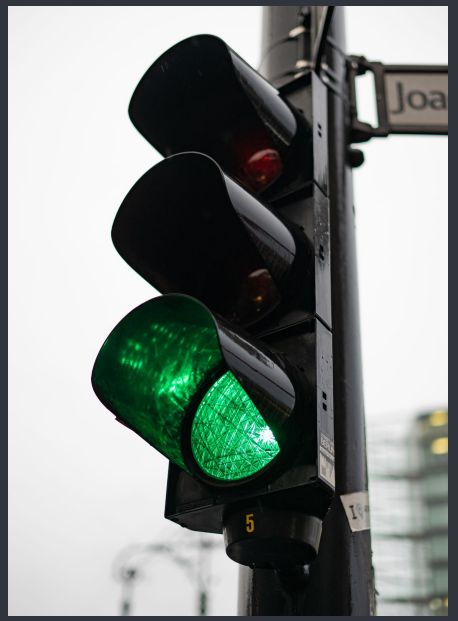
Nuclear Contamination

Nuclear weapons
Nuclear power sources
Safety Frameworks



Planetary Protection

Forward and Backward contamination
Quarantine procedures
Planetary Protection Policies



Situational Awareness

Space Traffic Management
Space Situational Awareness


disputes
and what space law provides
for their settlement

The UN Space Treaties

Outer Space Treaty

Art III: Application of the UN Charter and International Law

Art VI: State Responsibility

Article VII: Liability for Damage

Art VIII: Registration and Control

Art IX: Due Regard Regime of Consultation

Art III Outer Space Treaty

States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international co-operation and understanding.

Art IX Outer Space Treaty

Article IX Regime of “Consultation”: 3-step process

1. Prior notification of the planning of space activities
2. Right of the affected State to request consultations
3. Duty of the affecting State to enter into consultations in good faith

Liability Convention

Liability of the “ Launching States”

4 categories:

States that launch the space object,
States that procure the launch of the space object,
States from whose territory the object is launched, and
States whose facilities are used to launch the object.

Claims Commission

The claim must be presented

through diplomatic channels,
not later than one year following the date on which
the damage in question was sustained,
when the responsible State was identified, or
when the claimant State could reasonably be expected to have learned of the facts through the exercise of due diligence

If the injured party is an international organisation, the claim for reparation must be made by one of its member States, which must also be a party to the Liability Convention.

Liability Convention: Unique Features

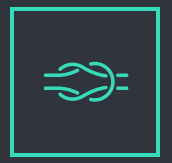
No condition on the prior exhaustion of local remedies

Victim-oriented: Shield against diplomatic protection

Prohibition of double reparation

Moon Agreement

Focus on the Good Offices role of the UN Secretary General



No binding obligation on States Parties to accept settlement proposals

Consultation Regime

- Art 8(3): Activities in avoid interference with those of other States Parties, States Parties concerned to undertake consultations
- Article 15: Consultation Procedure
Invokes the traditional processes of international dispute settlement (Article 15(3) read with Article 2)

Verification Regime

- Art 15: Verification procedure with the right of visit and control

UN General Assembly Resolutions

Traditional processes of international dispute settlement

Principle 7 DBS Principles
Principle XV RS Principles
Principle 6 NPS Principles, together with requirement that States respond prompt to requests for information

Consultation regime

Principle 10 DBS Principles
Principle XIII RS Principles

Basic Principles of International Space Law

Freedom of Exploration and Use

State Responsibility: *sui generis* scheme

Due Regard and Harmful Contamination

Non-Appropriation

Liability for Damage

Peaceful Purposes

Jurisdiction and Control

Peaceful Means of Dispute Settlement

Astronauts as Envoys of Mankind

Other Agreements

providing for dispute settlement mechanisms, including arbitration

Agreements providing for Negotiation

INMARSAT

Art 3, 1976 INMARSAT Convention, dispute to be submitted to arbitration in case of non-solution

ITU

Art 42, ITU Convention: dispute to be submitted to arbitration in case of non-solution

Agreements providing for Arbitration

INTELSAT

INMARSAT

EUTELSAT

ITU

ESA

Agreement providing for Adjudication

Article 19, 1976 Agreement on the Arab Corporation for Space Comunications (ARABSAT)

The General Body of ARABSAT “shall adjudicate upon disputes between the corporation, on the one hand, and one or more members, on the other, or disputes among the members themselves”.
Once decision is reached, is becomes effective within 90 days
Only clear example of adjudication in space activities

ILA Draft Convention

1998 ILA Final Draft of the Revised Convention on the Settlement of Disputes related to Space Activities

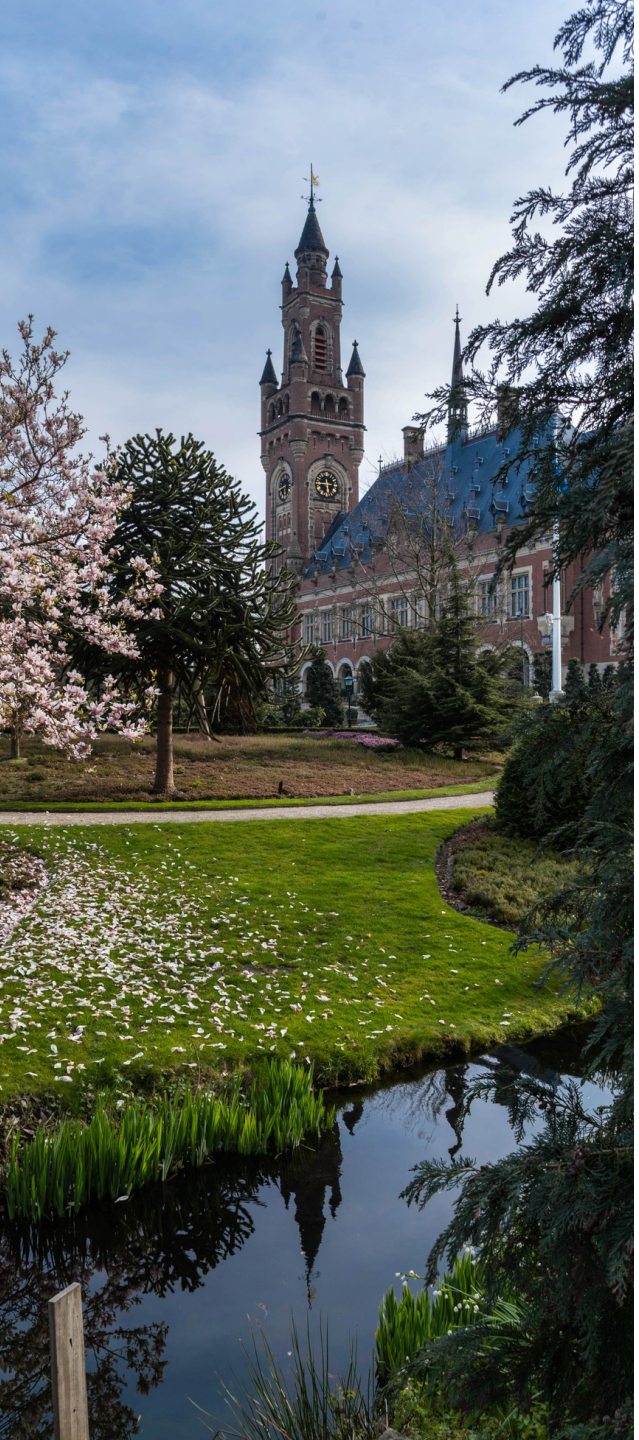
- Envisaged International Tribunal for Space Law (inspired by ITLOS)
-However, arbitration is the preferred default method of dispute settlement
- Private enterprise given direct access to envisaged International Tribunal

PCA Optional Rules

for Arbitration of Disputes Relating to Outer Space Activities

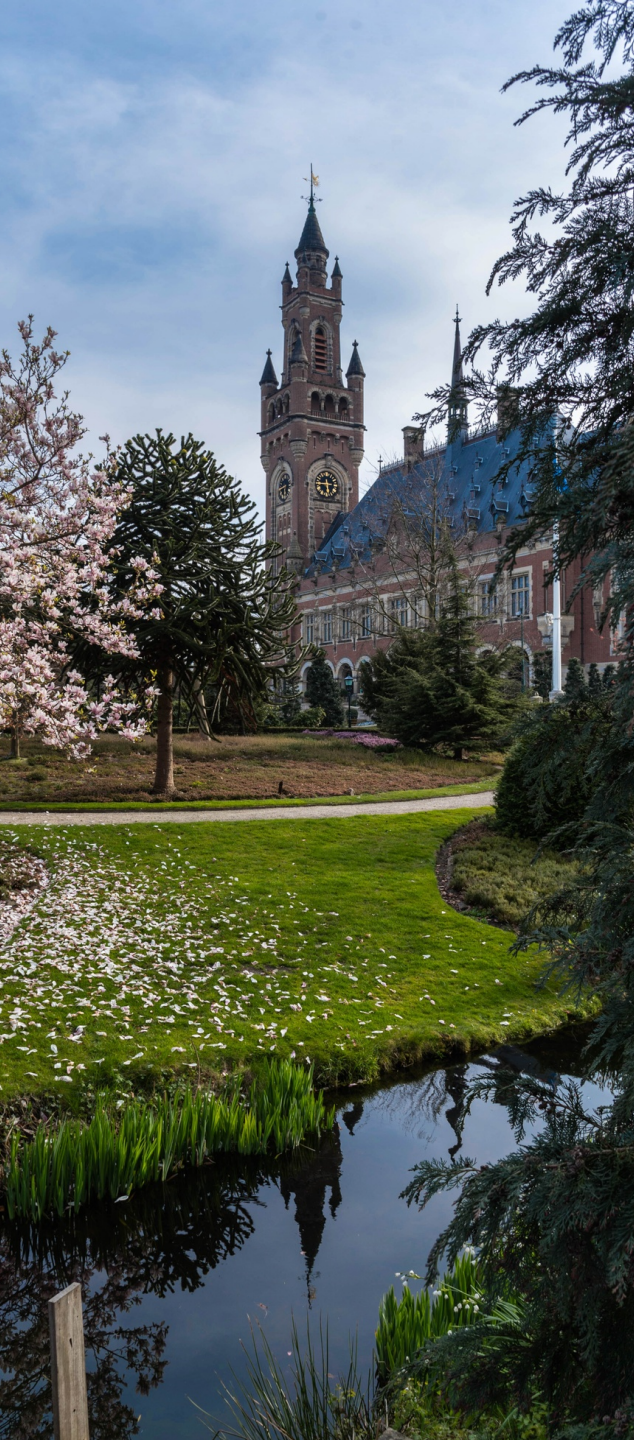
PCA Optional Rules: Quick facts

- based on 2010 UNCITRAL Arbitration Rules
- provide binding dispute resolution process
- bespoke for the space industry
- limited traction in the space community to date
- to date has not been used in space-related arbitration



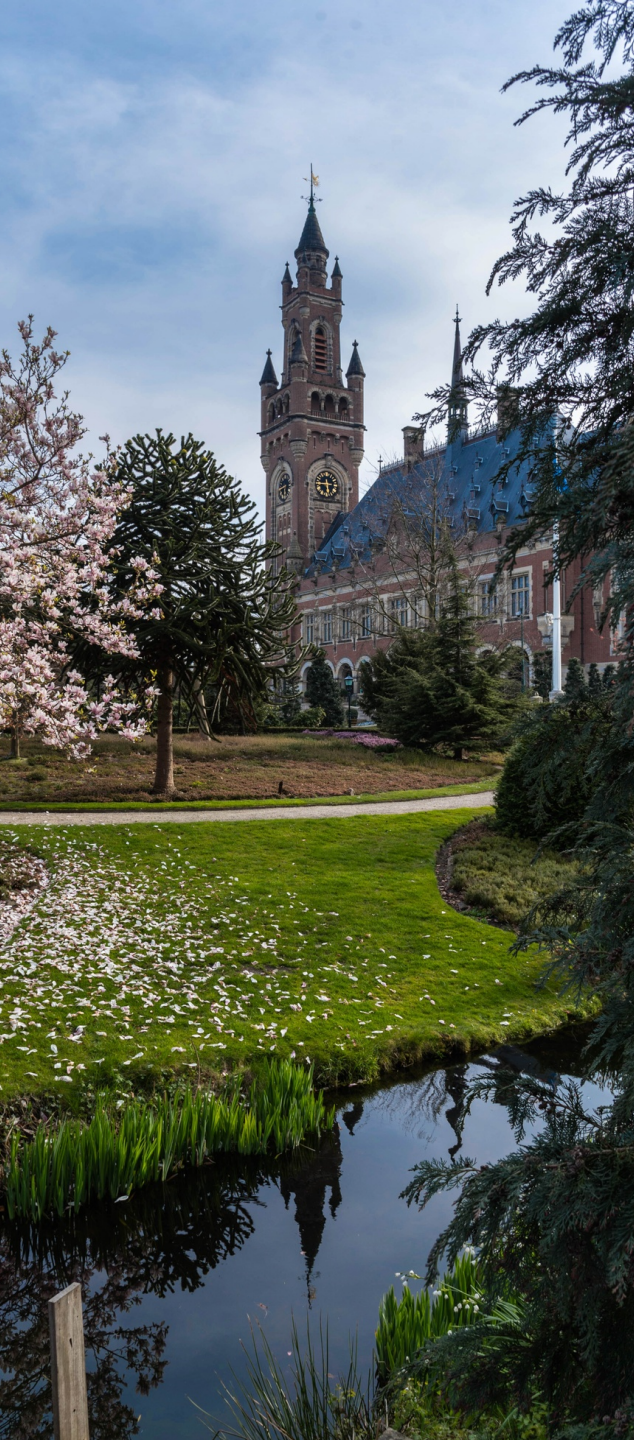
PCA Optional Rules reflects the balance between

- “the particular characteristics of disputes having an outer space component involving the use of outer space by States, international organizations and private entities”
- “the public international law element that pertains to disputes that may involve States and the use of outer space, and international practice appropriate to such disputes.”



PCA Optional Rules: Notable aspects

- Art 10(4): Specialised panel of arbitrators “for the purpose of assisting the parties”
- Art 6: Only the PCA’s Secretary-General may serve as the appointing authority (contrast with UNCITRAL Rules, which leaves this to the parties)
- Art 29(1): Specialised panel of scientific experts on “specific issues to be determined by the arbitral tribunal.”
- Art 27(4): Tribunal can request that parties produce non-technical document to assist the tribunal in understanding the complex technical issues involved
- Art 17(6): A party may apply to the tribunal to have certain information in the arbitration classified as confidential.



PCA Optional Rules: Why the low uptake?

- Parties are unaware of the PCA Optional Rules
- Parties are more comfortable with ICC/UNCITRAL frameworks
- The nature of the cases make the PCA Optional Rules unsuitable
- Existing legislation and contracts do not make sufficient provision/reference to the PCA Optional Rules
- Self-perpetuating cycle of low use and low credibility

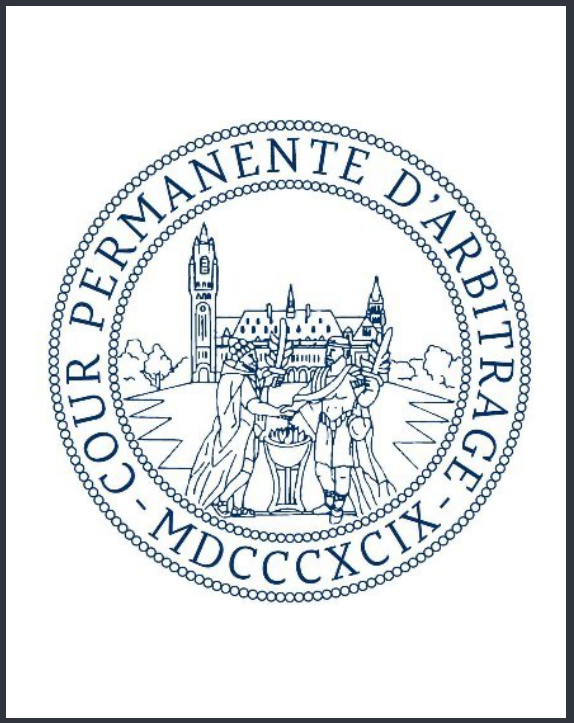

so where
have arbitrations on space-related disputes taken place?

Institutions that have administered space-related arbitral proceedings

International Chamber of Commerce

London Court of International Arbitration

International Centre for Dispute Resolution



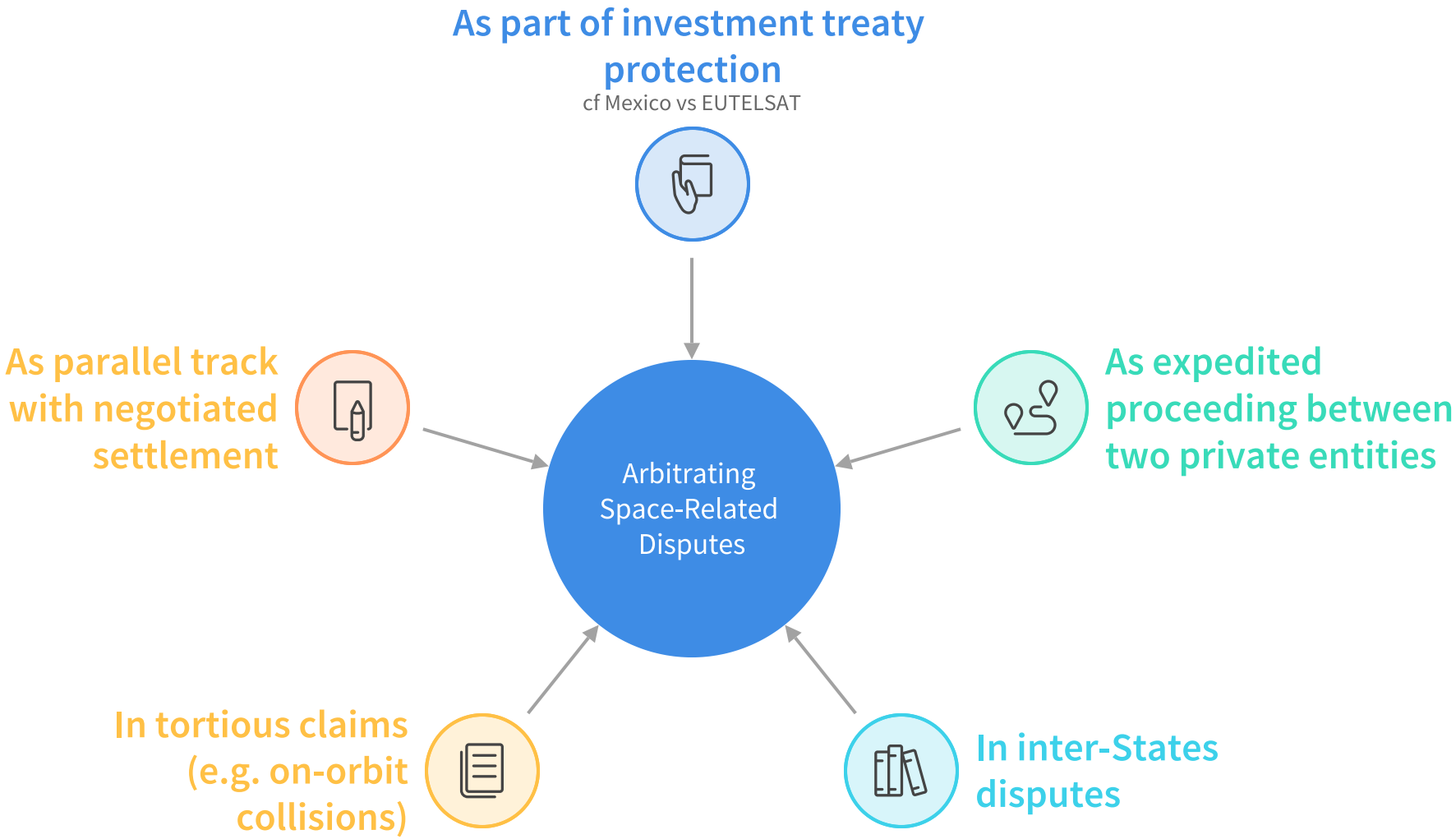
Permanent Court of Arbitration

(under the 1976 UNCITRAL Rules)


next
...and possibly with international commercial courts?


role
of arbitration in
space-related
disputes

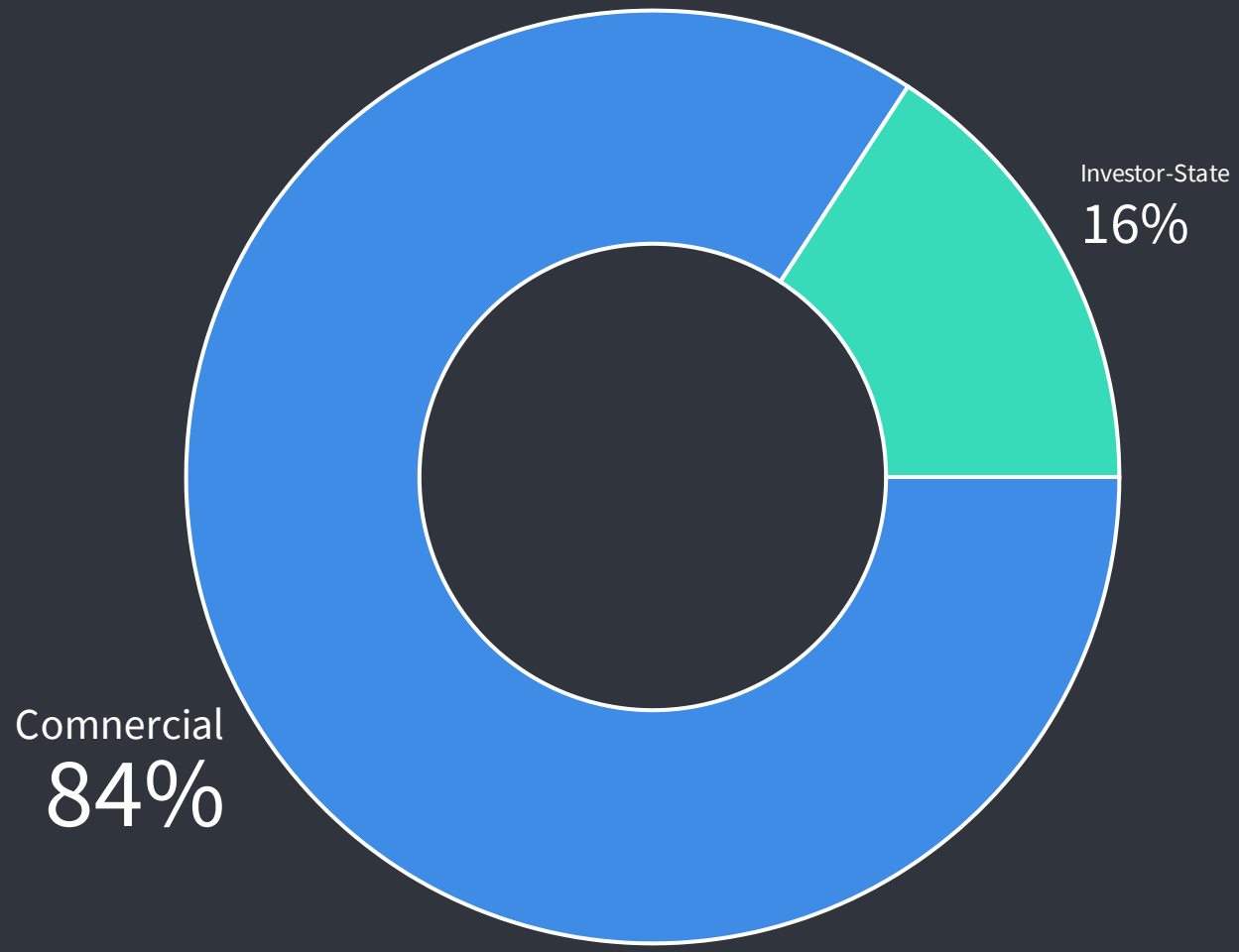
What role can arbitration play in space-related disputes?



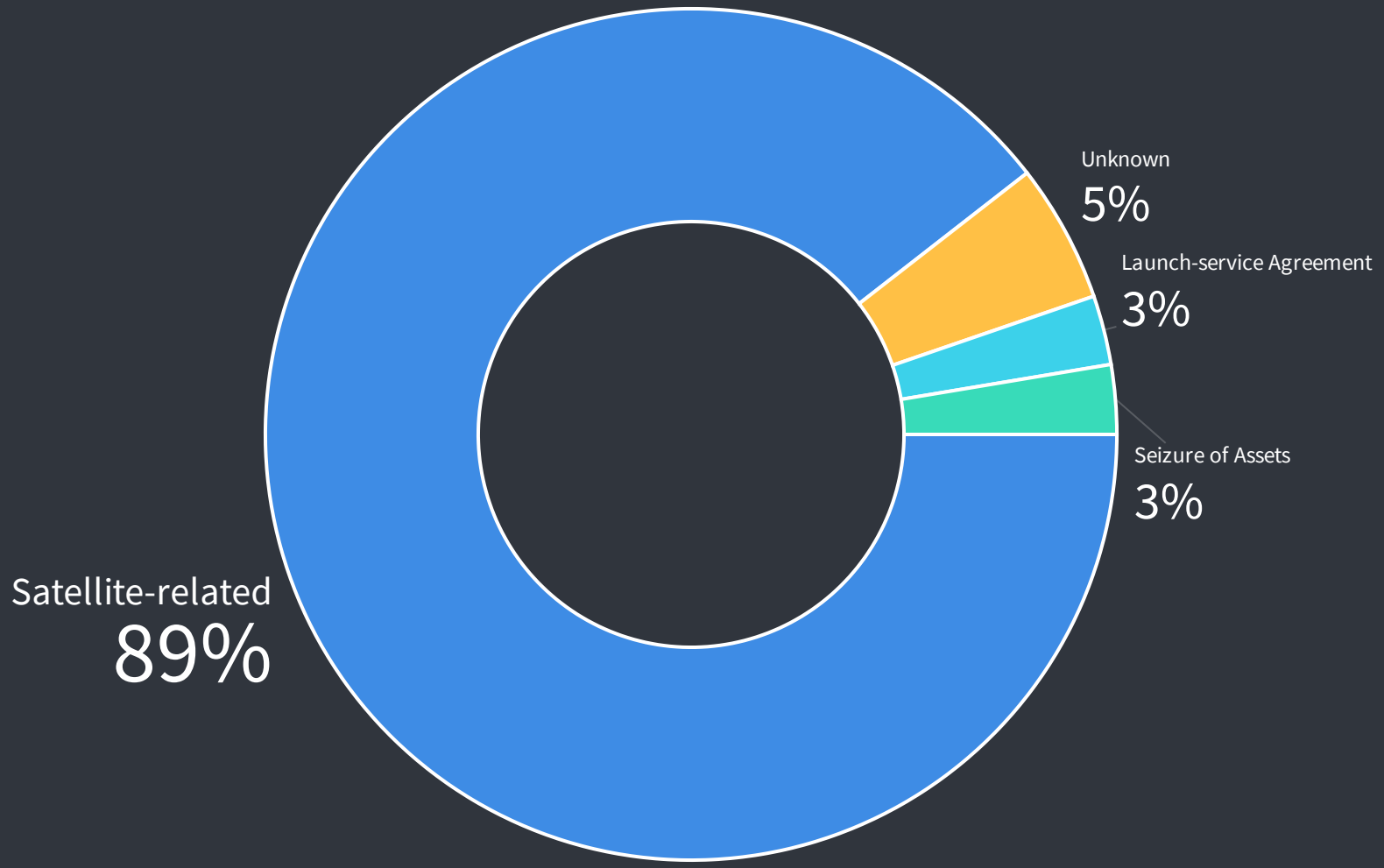

trends
in disputes arising from
space-related activities

Type of Dispute

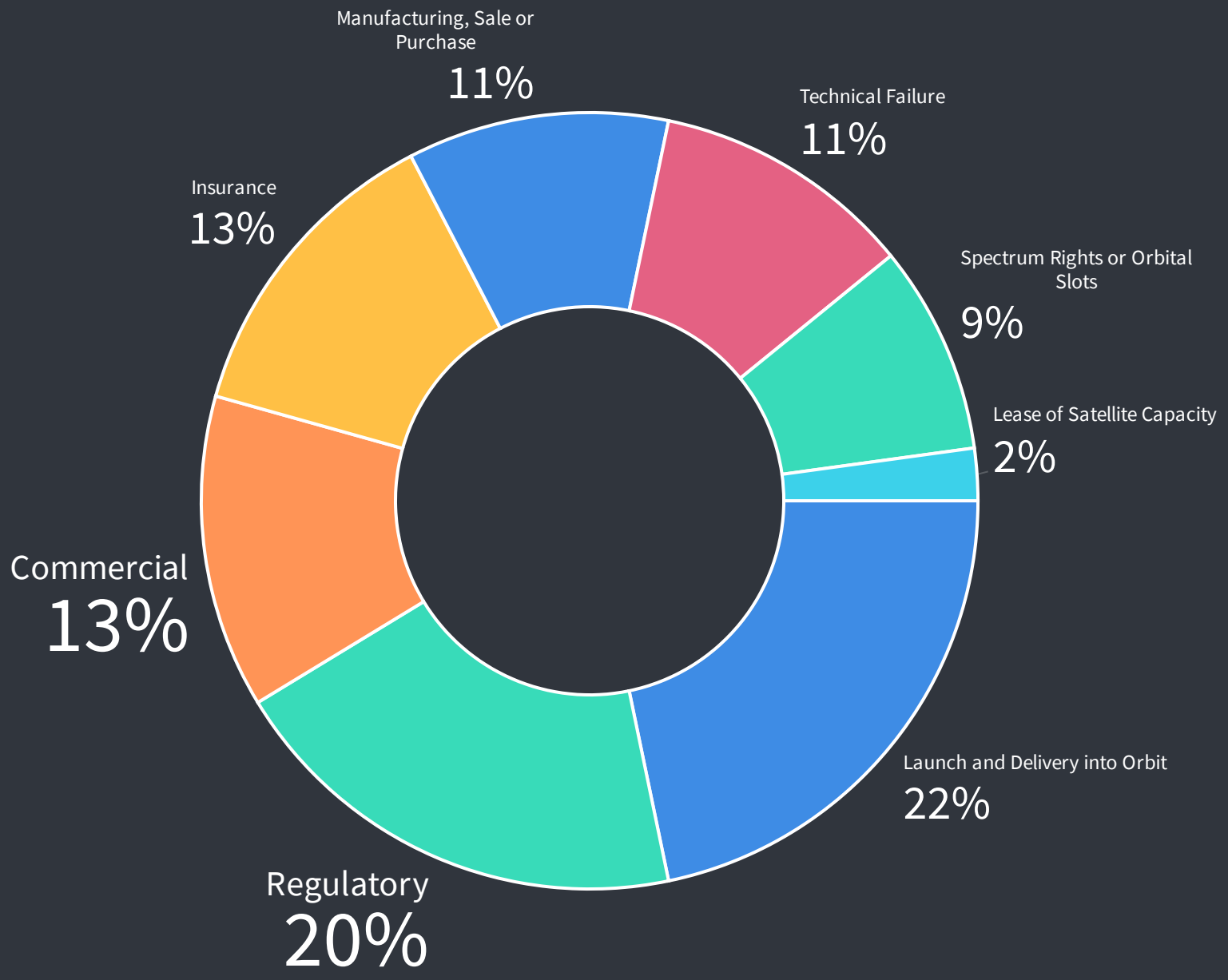
All statistics from Dadwal and Macdonald (2020) IAC-20-E714.58206, on file with the speaker



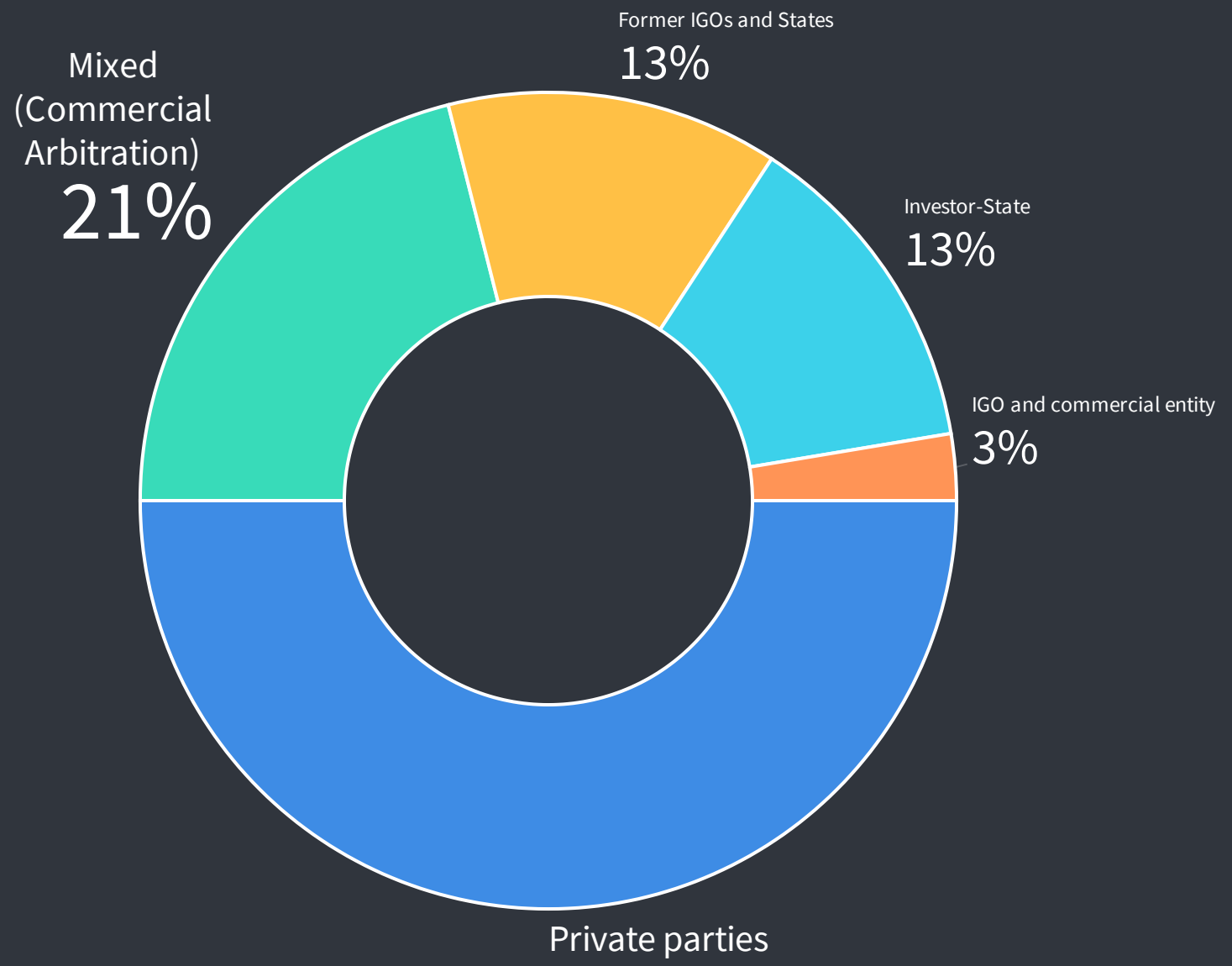
Subject Matter of Dispute



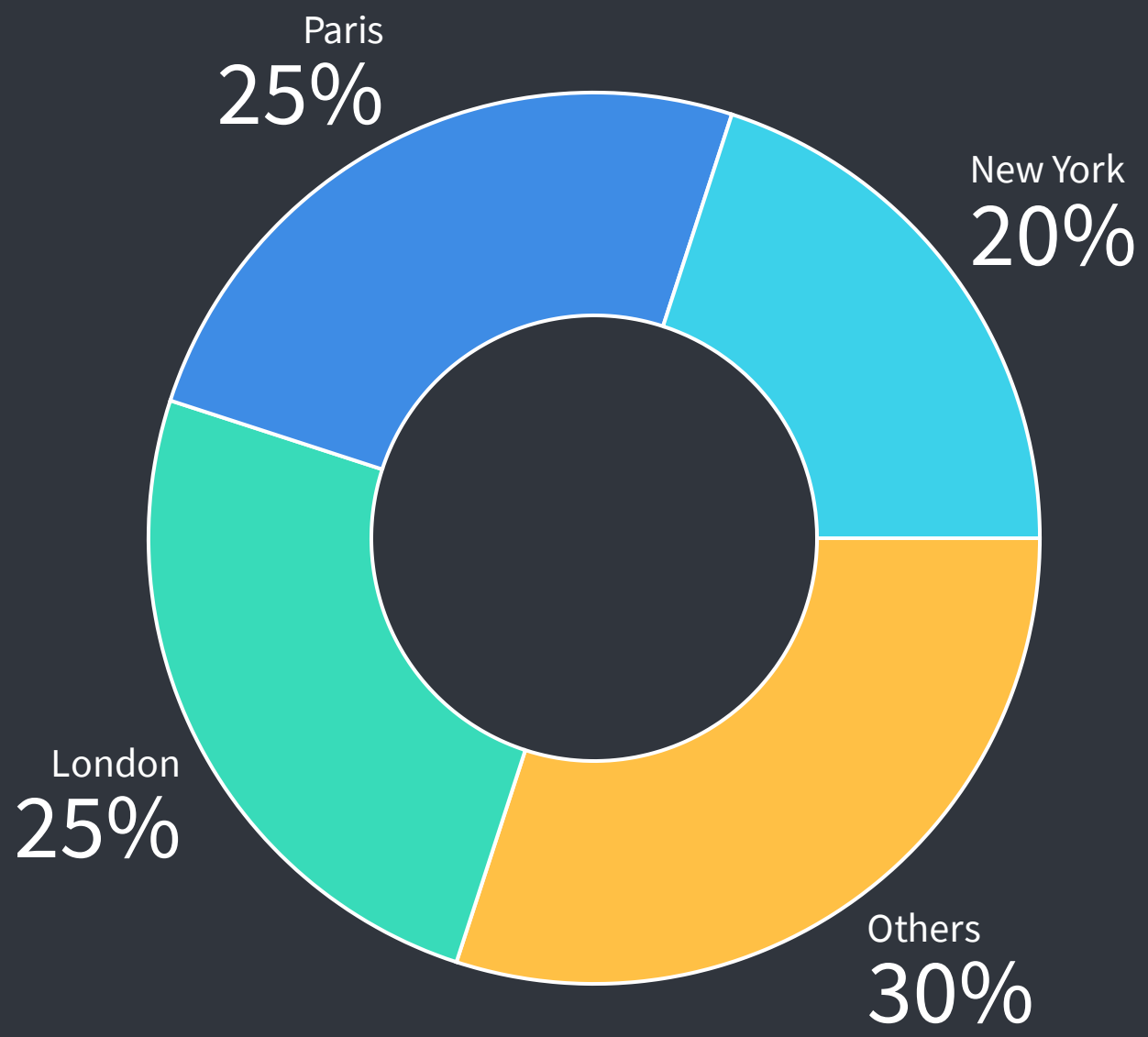
Where Dispute is Satellite-related...



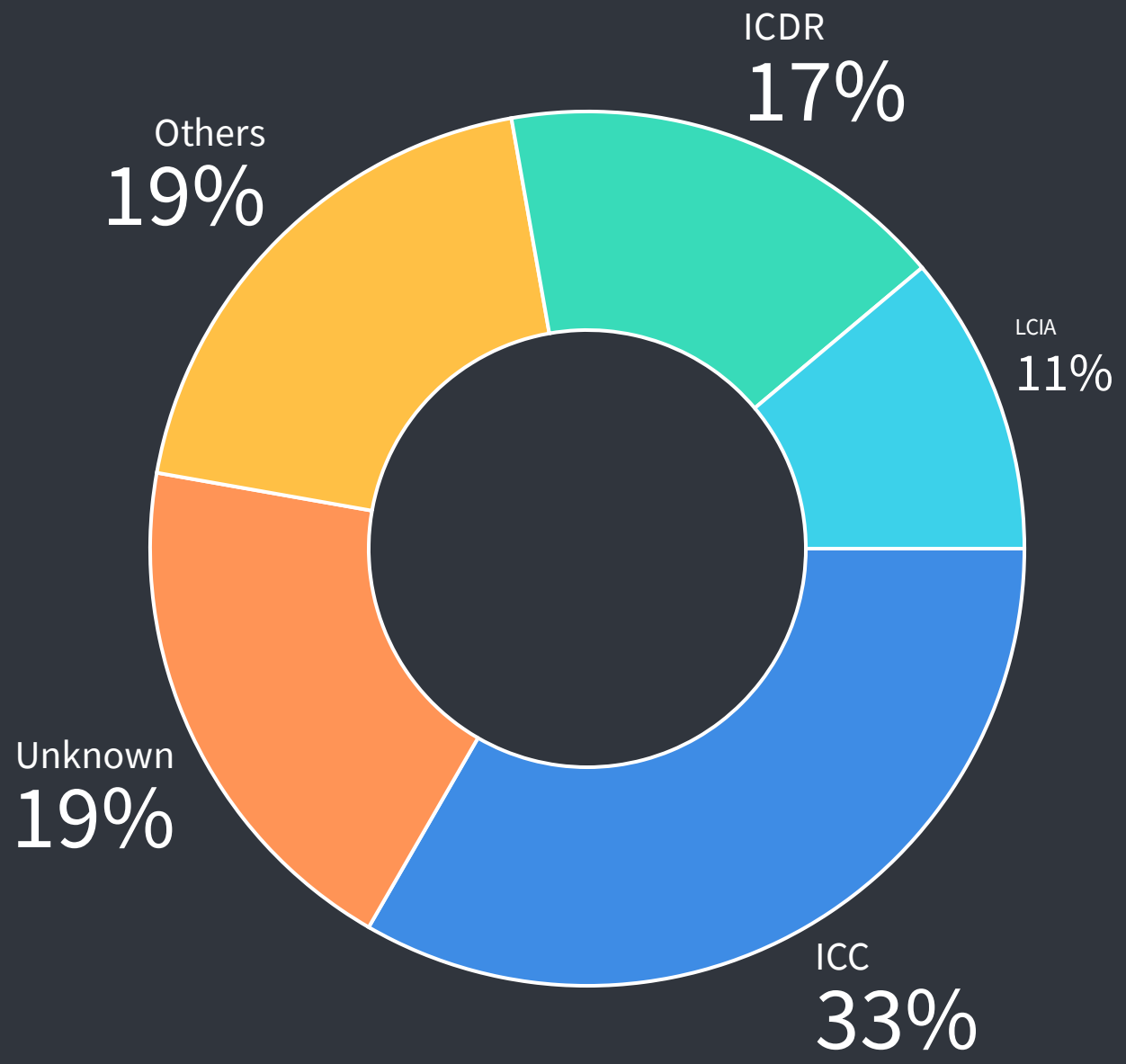
Where arbitration is employed



Preferred Seats



Administering Institution




issues
to consider when arbitrating
space-related disputes

Issues to Consider

Scientfiic/technical issues specific to the mission (e.g. launch window)

States' international obligations

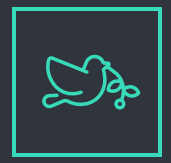
Private international law considerations

The type of parties to the dispute and their respective bargaining positions

Remedy sought (and whether recognisable and enforceable)

Whether there is a need for confidentiality (and whether this is desirable)

Potential harm to third parties



Verification of implementation of award

Diplomatic and jurisdictional immunities

Domestic legislation

Some Key Takeaways

Most arbitration involves satellites

- 90% of known arbitration proceedings involve satellites
- Amounts claimed vary

Disputants changing

- Commercial entities make up the bulk of parties
- Public institutions increasingly involved

Existing space-specific arbitraton infrastructure needs improvement

- International commercial arbitration framework most leveraged

Contribution to Evolving Field of Law

- How can the confidential nature of arbitration, prized for business efficacy and national security, contribute to this evolving field?


case
studies in arbitral awards

Devas v. Antrix

Devas Multimedia Private Limited v. Antrix Corporation Limited, ICC Case No. 18051/CYK

Devas v. India

Devas v. India, PCA Case No. 2013-09

Deutsche Telekom v. India

Devas v. India, PCA Case No. 2014-10

ABSH v. KT and KTSAT

ABS Holdings, Ltd and ABS Global, Ltd v. KT Corporation and KTSAT Corporation, ICC Case No. 19958/AGF/RD/MK

Eutelsat v. Mexico

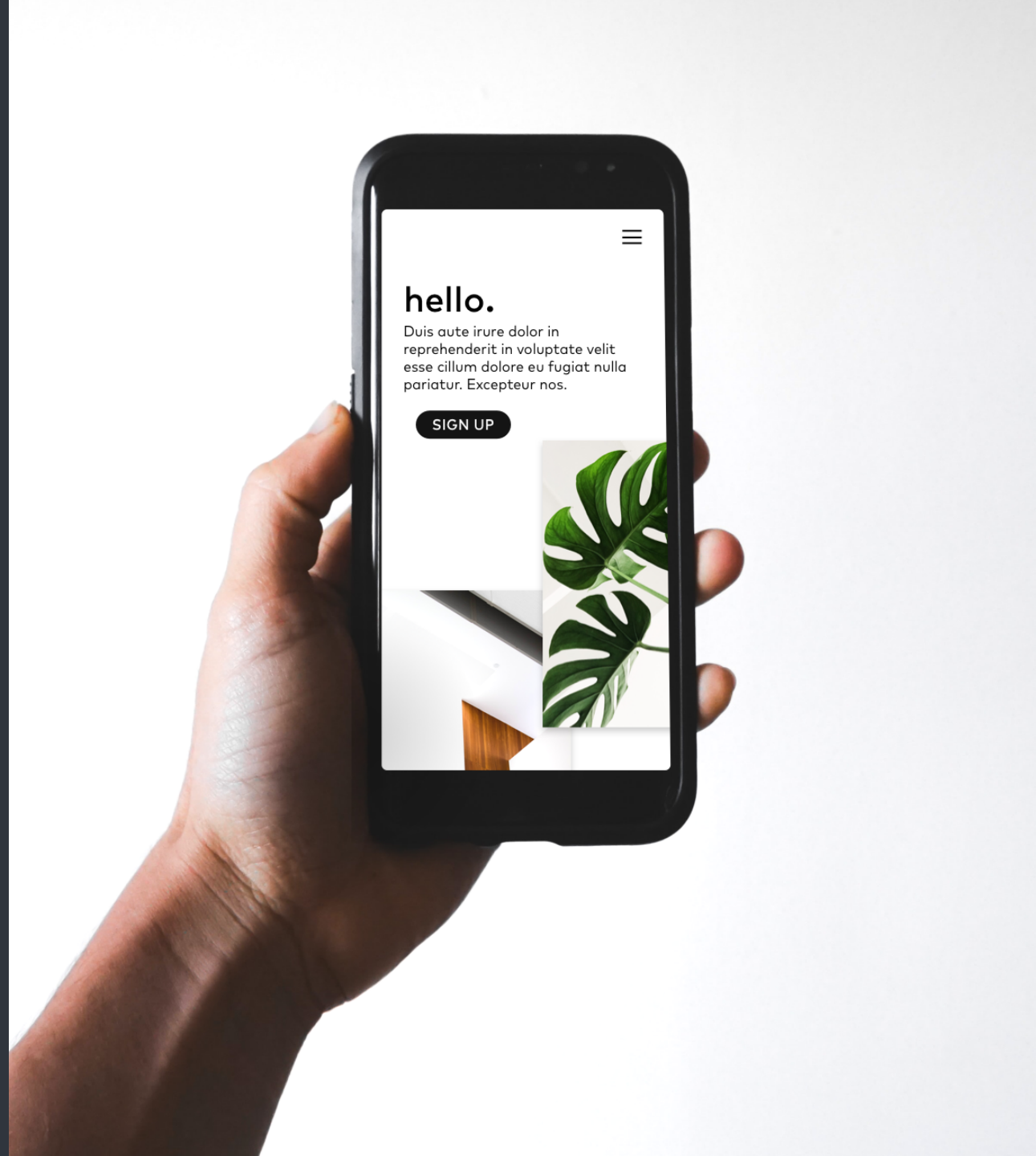
ICSID Case No. ARB(AF)/17/2

Let's stay in touch

G.GohEscolar@nus.edu.sg

https://www.linkedin.com/in/gerardinegoh/

https://twitter.com/GeriGohEscolar



ARBITRATION LAB | LONDON SUMMER ARBITRATION SCHOOL | 29 JUNE 2023

Outer Space Arbitration

Dr Gerardine Goh Escolar
Professor (Adj)
Faculty of Law | National University of Singapore