

ARBITRATION LAB | LONDON SUMMER ARBITRATION SCHOOL | 19 JUNE 2025

Outer Space Arbitration

Dr Gerardine Goh Escolar
Professor (Adj)

Faculty of Law | National University of Singapore





space.

the final frontier



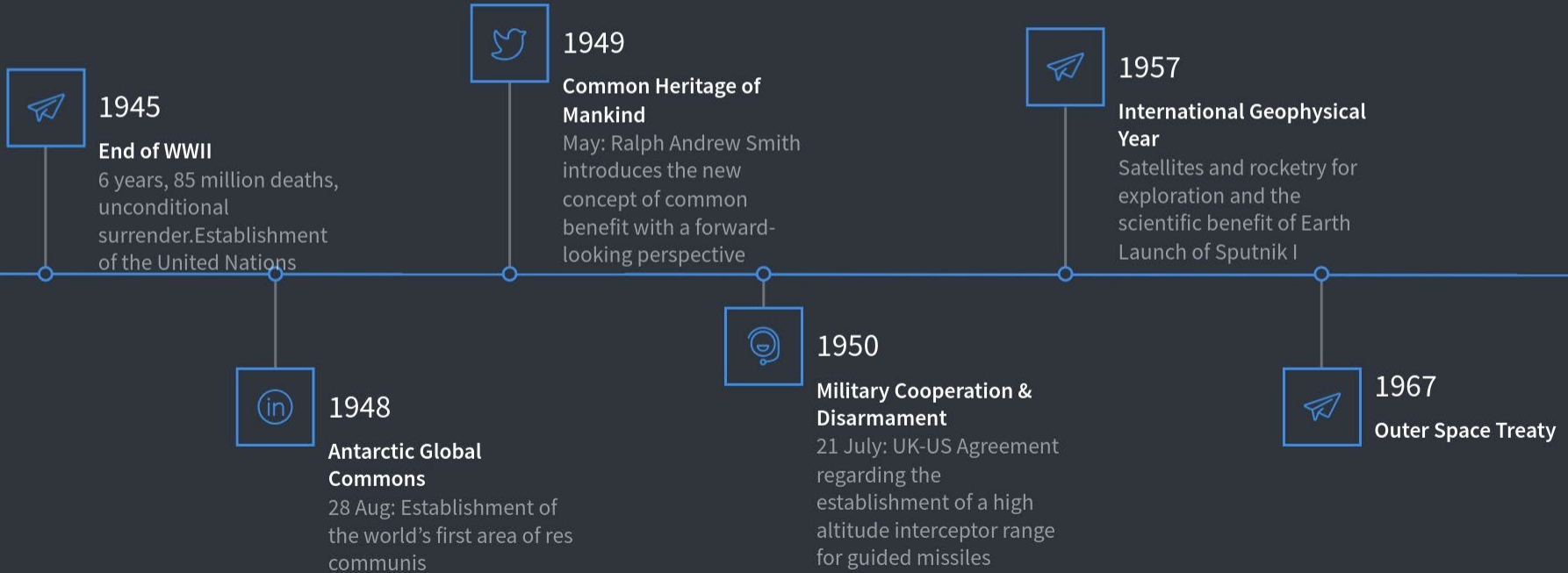
**TL;DR: Has One
line in the movie
about space law.
Doesn't get it
right.
Mark Watney
Needs a space
lawyer ;)**



how

did we get here?

Context: Origins of Human Activity in Outer Space



Actors and Context



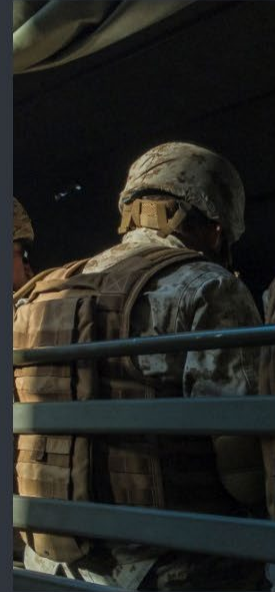
International
Geopolitics



Space
Environment,
Science &
Technology



Proliferation of
Different Actors



Military Uses and
Dual Use



Commercialisation



Enforcement and
Verification



what

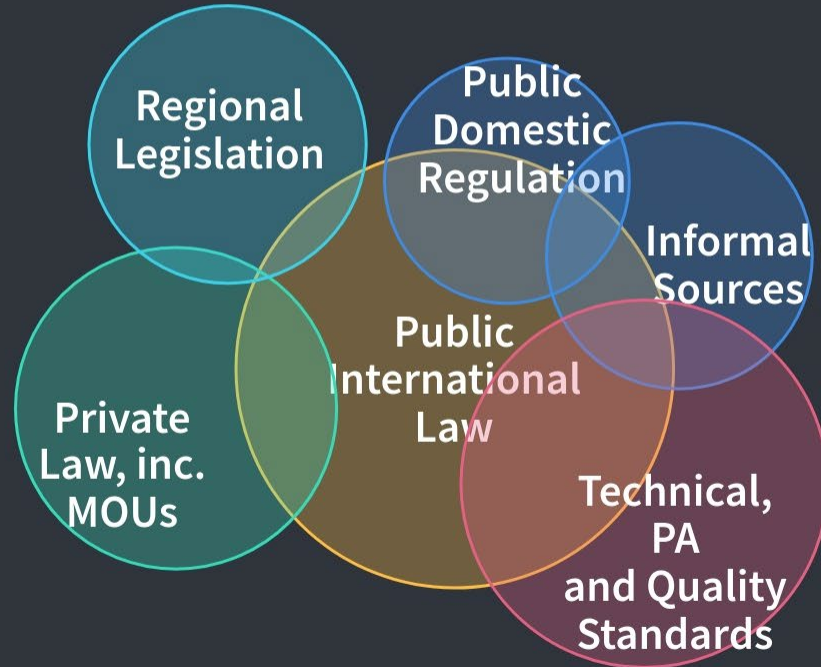
is the legal framework governing
human activities in outer space?

What is space law?

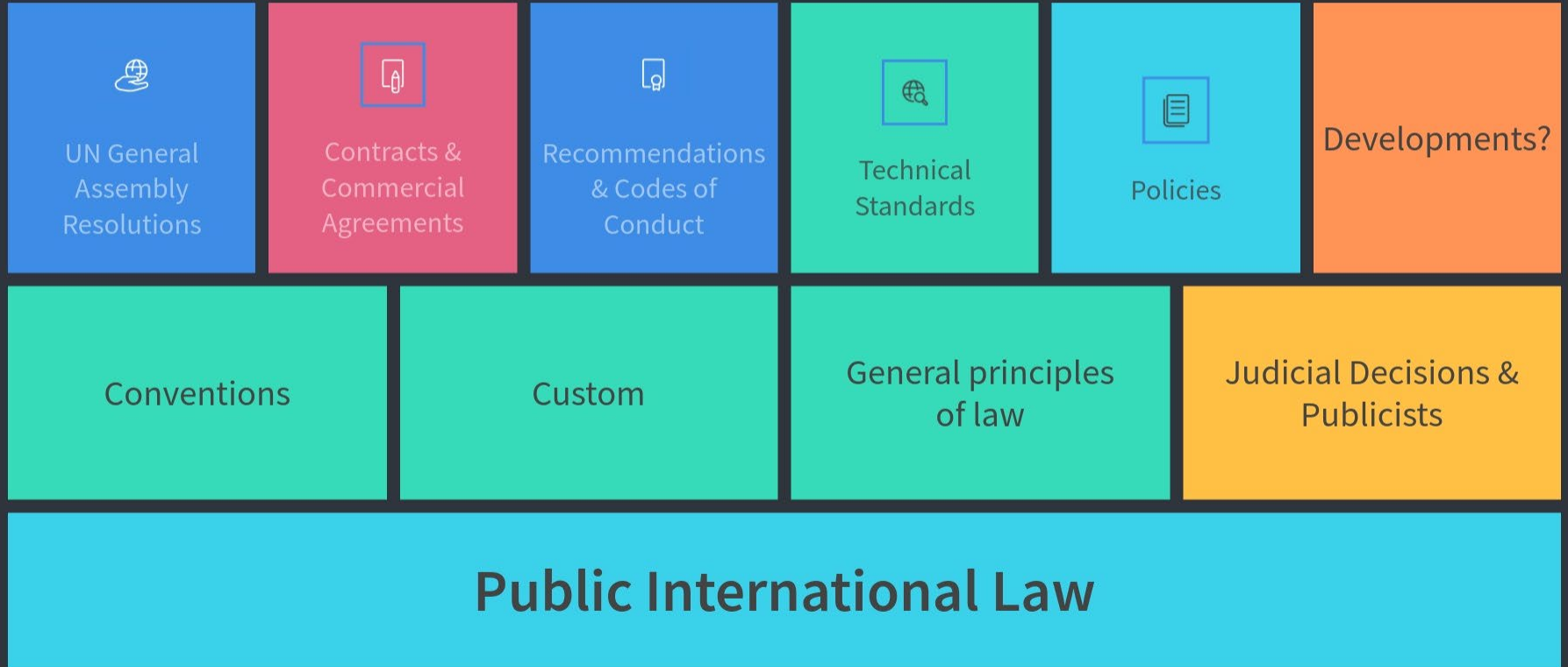


What is “space law?”

Sources of Law



The Public International Space Law Ecosystem



Treaties

- 1 1967 Outer Space Treaty
- 2 1968 Rescue Agreement
- 3 1972 Liability Convention
- 4 1975 Registration Convention
- 5 1979 Moon Agreement
- 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



7 Global Trends

- 1 Space as an essential public good
- 2 Long-term global sustainability
- 3 Space activity management
- 4 Democratisation of the space industry
- 5 Evolution of a multi-planetary species
- 6 SpaceTech in combination with information and computational technology
- 7 Blurred lines between space law and other fields of law

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



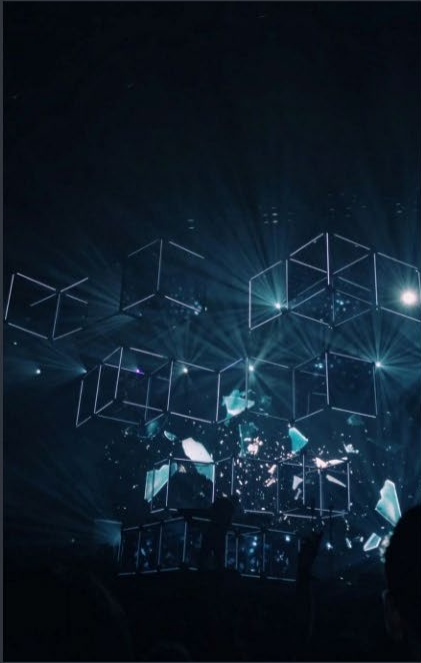
420B

Size of the global
space economy
in 2024



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



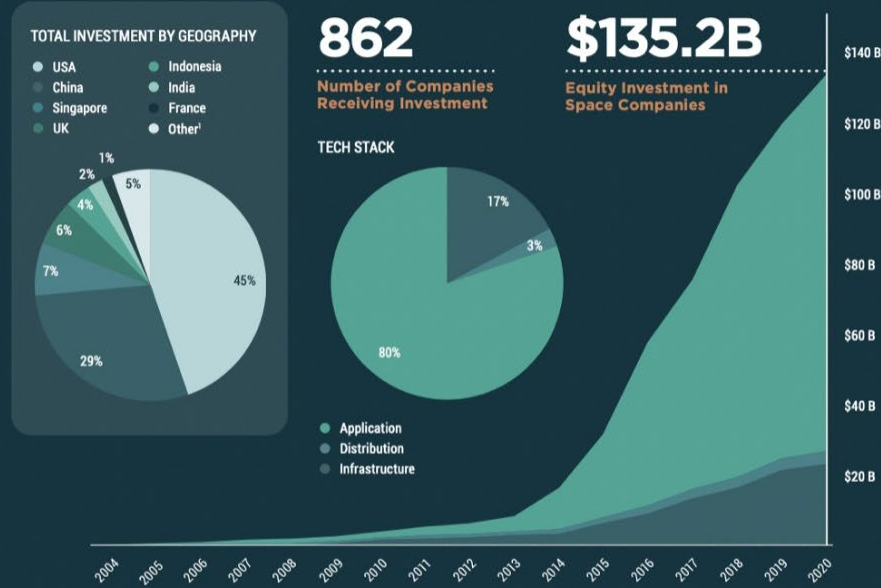
Transfer of Military-Grade Technology



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

The Satellite Industry in Context

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

Non-Satellite Industry

- Government space budgets
- Commercial human spaceflight

\$300M+
Space
Sustainability
Activities



\$7.2B
Launch



\$17.2B
Satellite
Manufacturing



\$114B

Prepared by:



Satellite Services

- Telecommunications
- Remote Sensing



\$400B
Global Space
Economy

\$285B
Satellite
Industry
71% of
Space
Economy

Ground Equipment
\$150.4B

- Network Equipment
- Consumer Equipment



Satellite Services

2023 Revenues:
\$110.2B

\$65.7B \$44.5B

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)



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

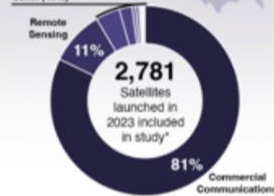


Satellite Manufacturing

2023 Revenues:
\$17.2B

\$9.3B

- RAD (4%)
- Military Surveillance (2%)
- Navigation (1%)
- Civ/Mil Communications (<1%)
- Scientific (<1%)
- SSA/Satellite Servicing (<1%)
- Other (<1%)

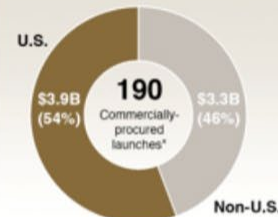


Satellites Launched by
Mission Type



Launch Industry

2023 Revenues:
\$7.2B



Commercial Launch Revenues
by Region

* 190 commercially procured launches from 221 total orbital

Changing Industry Dynamics: Increasing Affordability and Productivity, New Capabilities

Improved capability, innovative application of smallsats

New applications, new models

More capable, lower cost GEO satellites



Increased launch activity

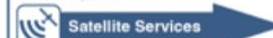
Changing launch landscape



Massive telecom constellations of smallsats delivering service

More GEO satcom capacity enabling new services

More commercial remote sensing choices, capabilities



Debris removal
Moving satellites

Life extension
SSA

In-orbit assembly

Growing on-the-move connectivity

Broadband, satellite radio installations on the rise

5.6B GNSS satellite-enabled smartphones, other devices

Sat to cellphone capability deploying
Television viewership changing from traditional models



Ground Segment

Changing industry dynamics provide increased end user benefits

- Increasing productivity
- Increasing affordability
- New capabilities
- New space sustainability concepts
- Greater resiliency
- Economic growth



End Users

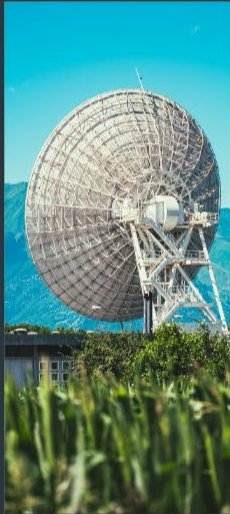
Consumer, industry, government, and non-profits

All sectors of the economy
Global

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



Reusable launch vehicles



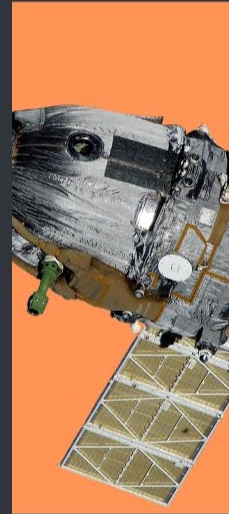
Situational awareness



Space tourism and transport



In-space research and manufacturing



Smallsat, infrastructure and platform manufacturing



Satellite servicing



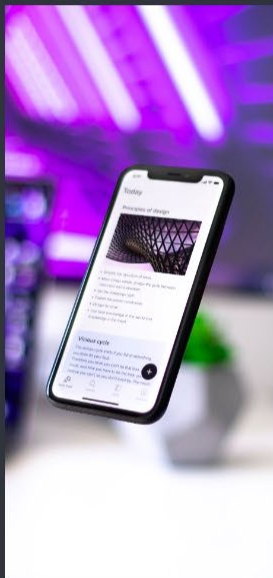
Space mining / resource utilisation



sectors

in the newspace economy

Satellite Applications



Telecoms



Direct
Broadcasting



Connectivity and
Internet of
Things



Earth
Observation



Global
Navigation and
Location-Based
Services

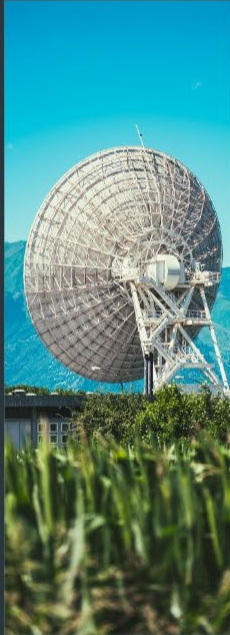


Science, Weather
and
Informational
Networks

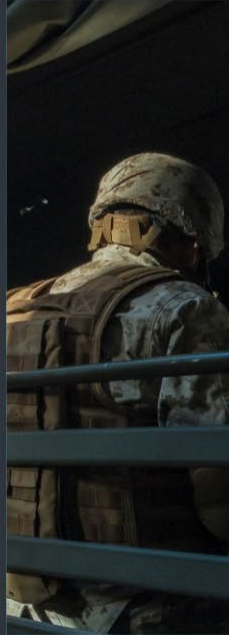
Sectors with Long-term Growth Potential



Launch facilities and services



Smallsat manufacturing



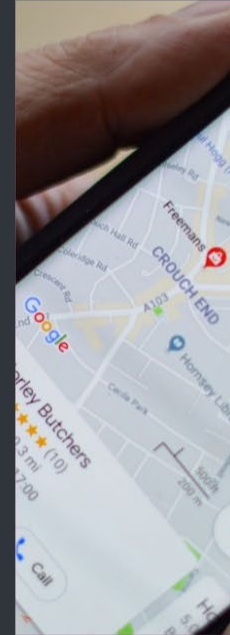
Military, defence and security



Consumer broadband and satellite radio



EO-driven data analytics



Navigation and location-based apps



Space mining

Sectors Attracting Investment



Reusable launch vehicles



Situational awareness



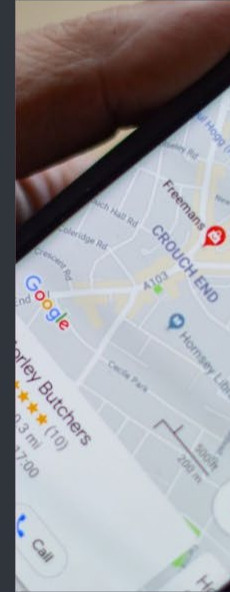
Space tourism and transport



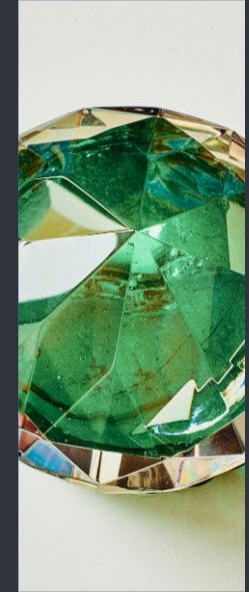
In-space research and manufacturing



Smallsat, infrastructure and platform manufacturing



Satellite servicing

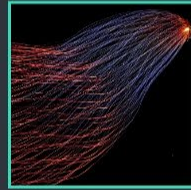


Space mining / resource utilisation

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



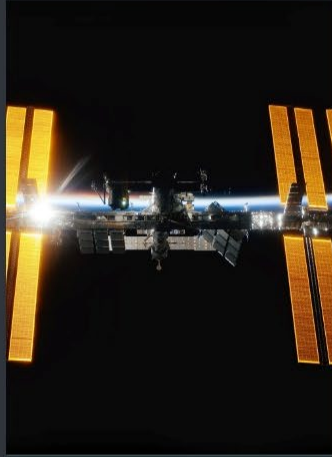
Artemis Accords

Environmental Protection and Situational Awareness



Due Regard & Environmental Protection

Minimum international standards
Due regard and appropriate measures



Orbital Debris

The Problem
Mitigation
Remediation



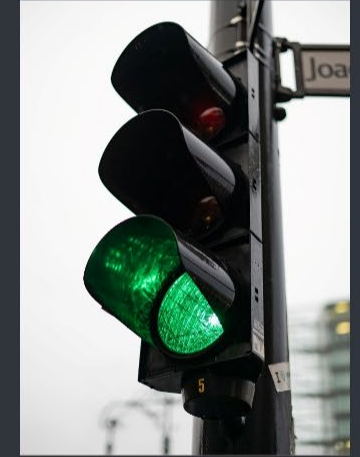
Nuclear Contamination

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 VIII: Registration and Control



Art VI: State Responsibility



Art IX: Due Regard Regime of Consultation



Article VII: Liability for Damage

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 promptly 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



ITU



INMARSAT



ESA



EUTELSAT

Agreement providing for Adjudication



Article 19, 1976 Agreement on the Arab Corporation for Space Communications (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
- Existing legislation and contracts do not make sufficient provision/reference to the PCA Optional Rules
- Parties are more comfortable with ICC/UNCITRAL frameworks
- Self-perpetuating cycle of low use and low credibility
- The nature of the cases make the PCA Optional Rules unsuitable



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®

International Centre for
Dispute Resolution



Permanent Court of
Arbitration

(under the 1976 UNCITRAL Rules)

A dark, draped fabric with a circular opening revealing a starry blue sky. The fabric is dark brown or black, with deep folds and highlights. The opening in the center shows a vibrant blue sky filled with numerous small, white stars, creating a celestial or futuristic atmosphere.

next

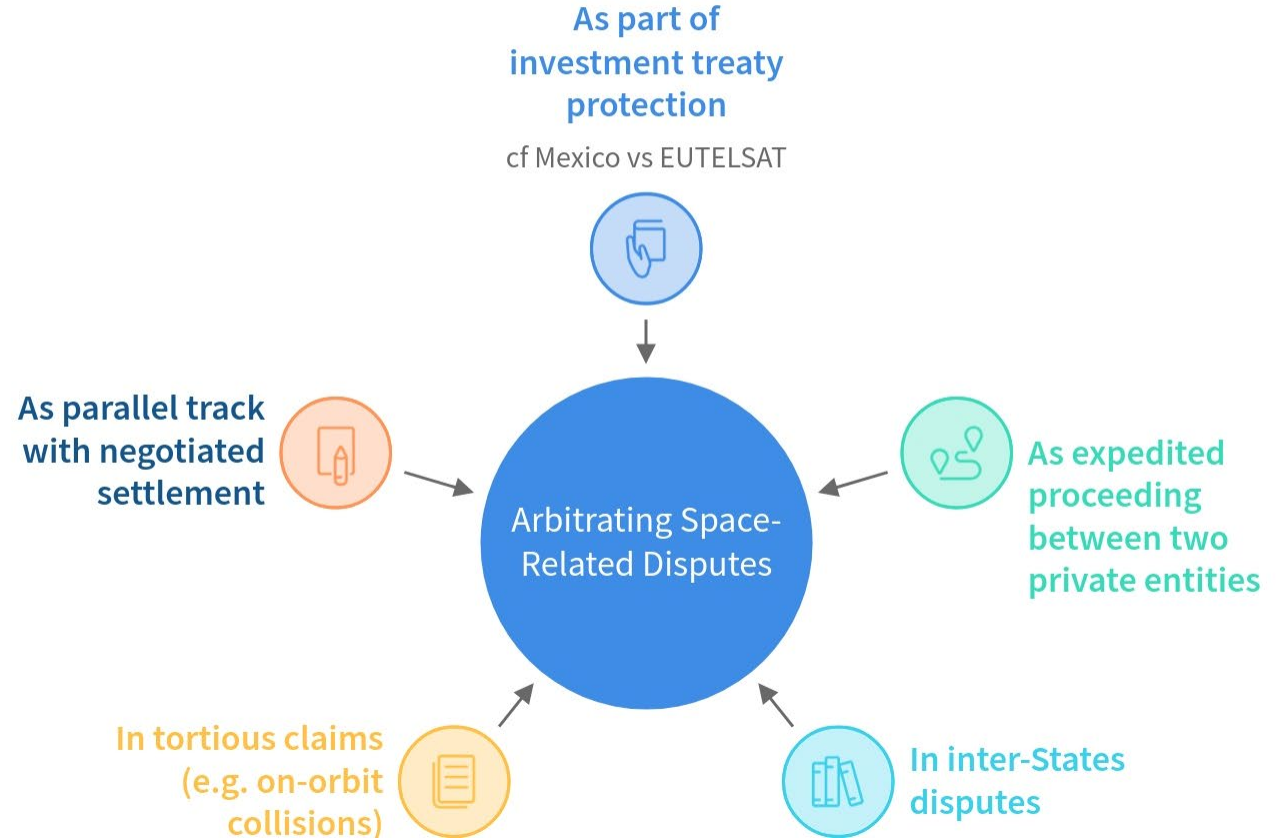
...and possibly with international
commercial courts?

The background features a dark, textured fabric, possibly a curtain or a piece of heavy cloth, that is pulled back to reveal a vibrant blue night sky filled with numerous small, bright stars. The lighting is dramatic, with the fabric appearing in deep shadow and the sky glowing with a rich, teal-blue hue.

role

**of arbitration in space-related
disputes**

What role can arbitration play in space-related disputes?



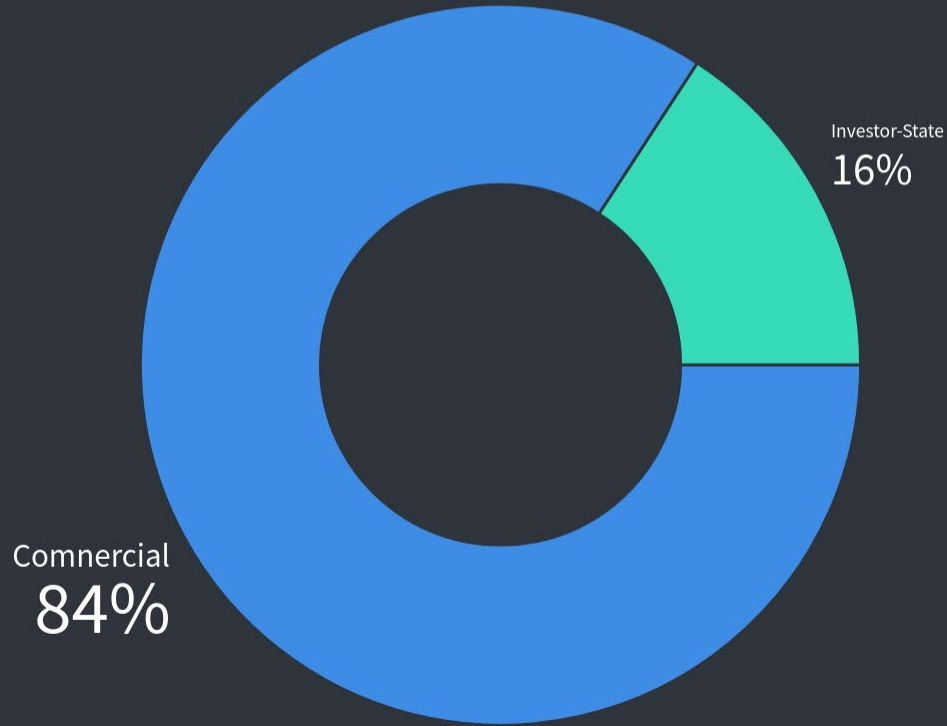


trends

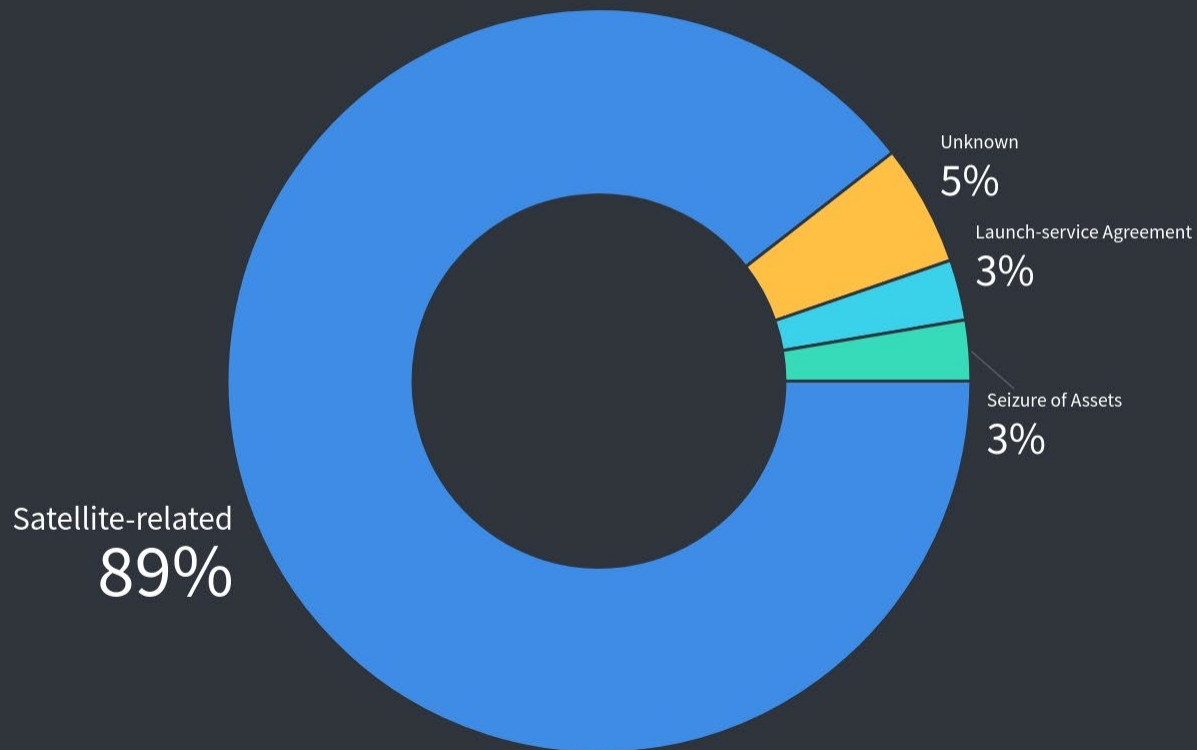
in disputes arising from space-related
activities

Type of Dispute

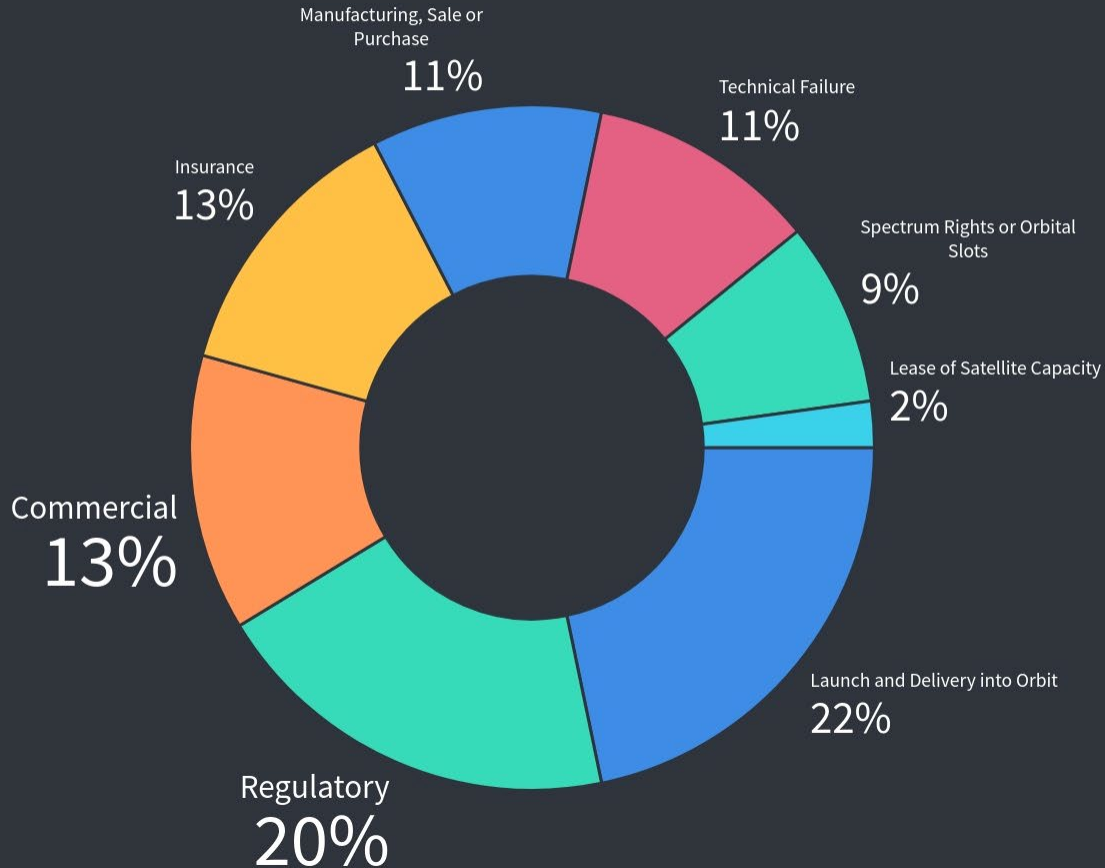
All statistics from Dadwal and Macdonald (2020) IAC-20-E714.58206, on file with the speaker



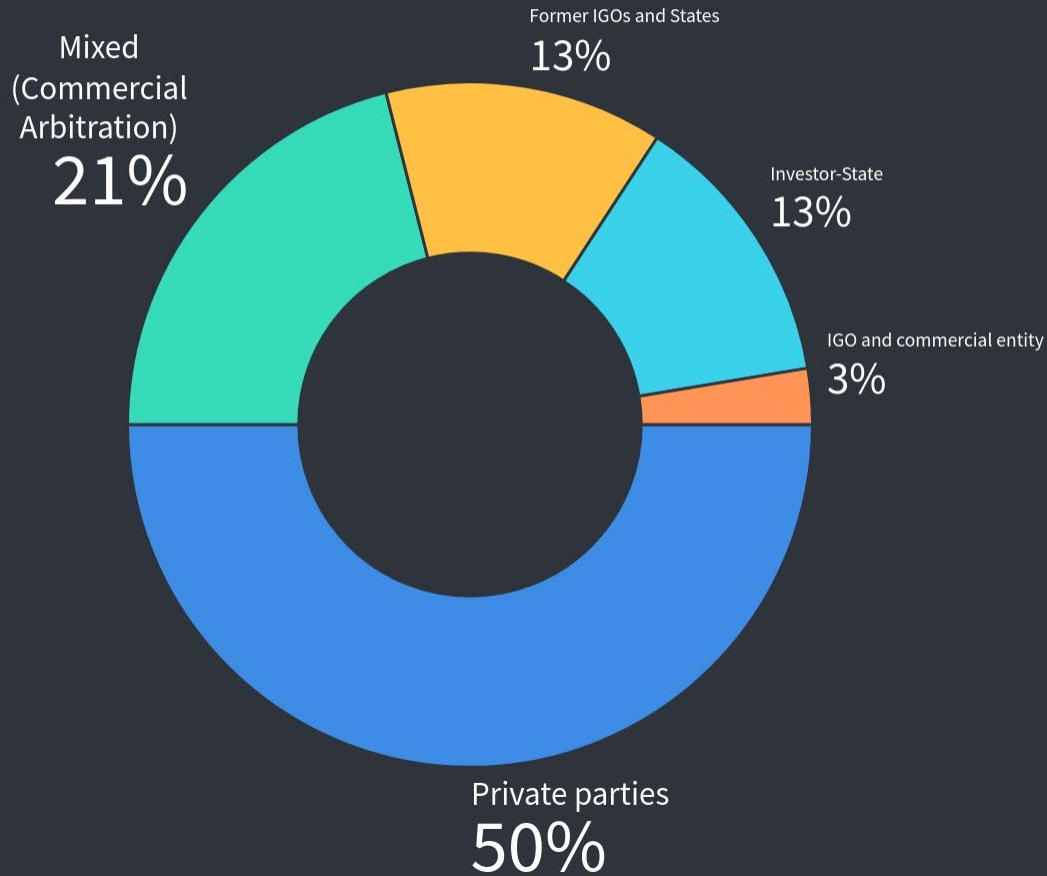
Subject Matter of Dispute



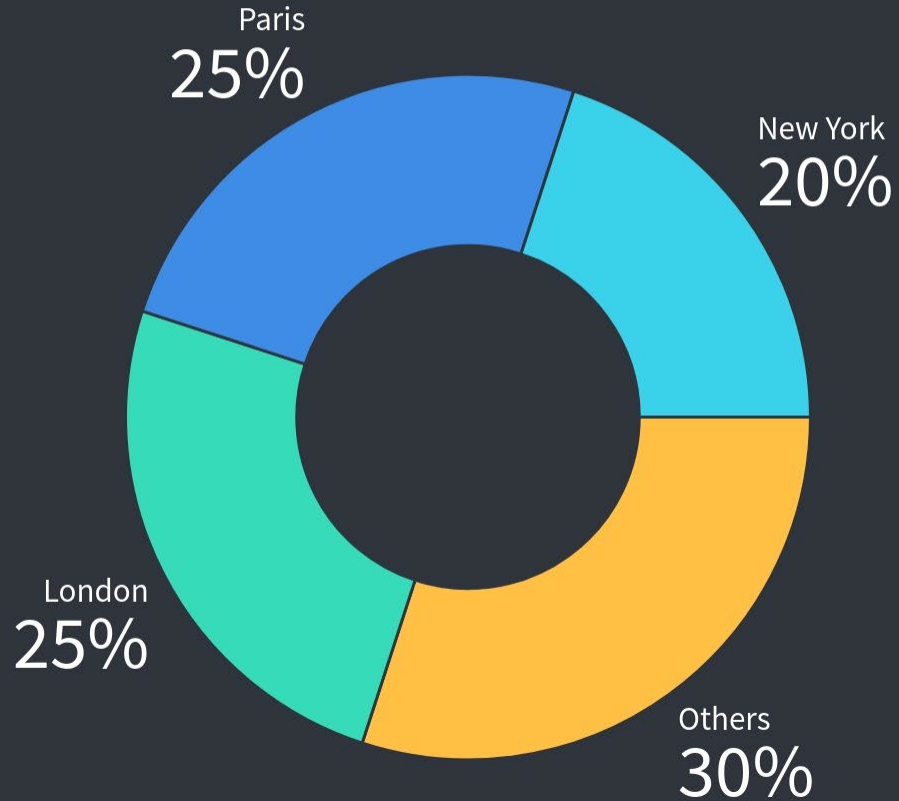
Where Dispute is Satellite-related...



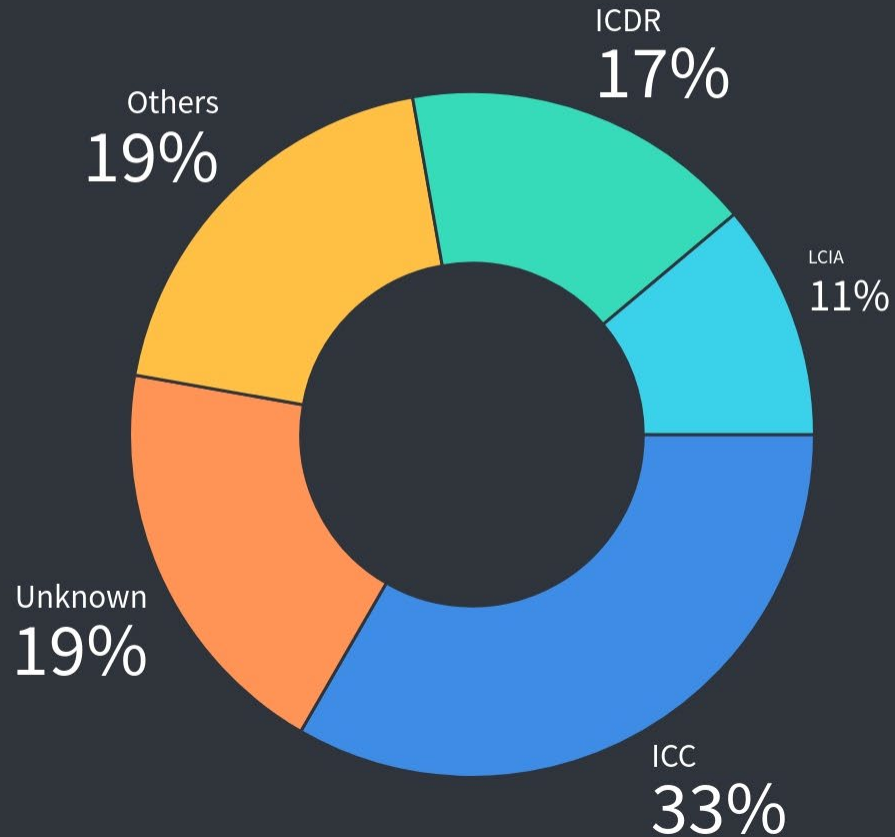
Where arbitration is employed



Preferred Seats



Administering Institution

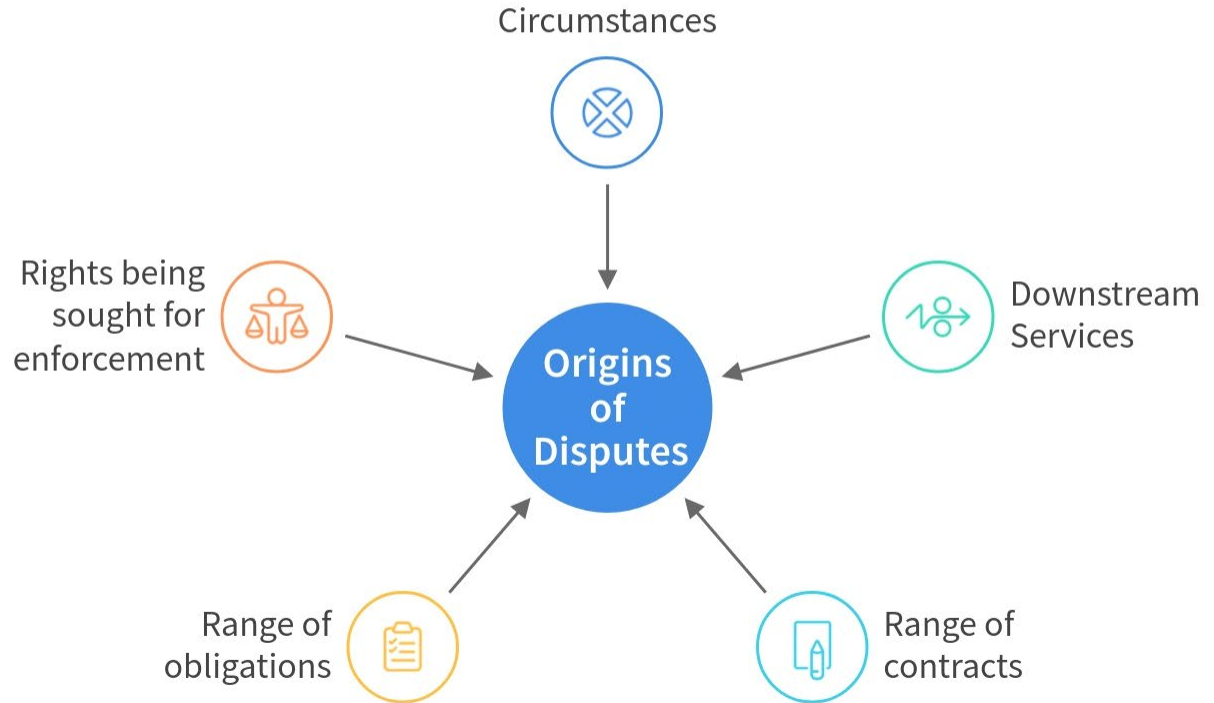




• issues

to consider when arbitrating space-
related disputes

Wide-ranging possible origins of disputes



Public institution/policy involvement



Mandatory use of certain forms of
dispute settlement

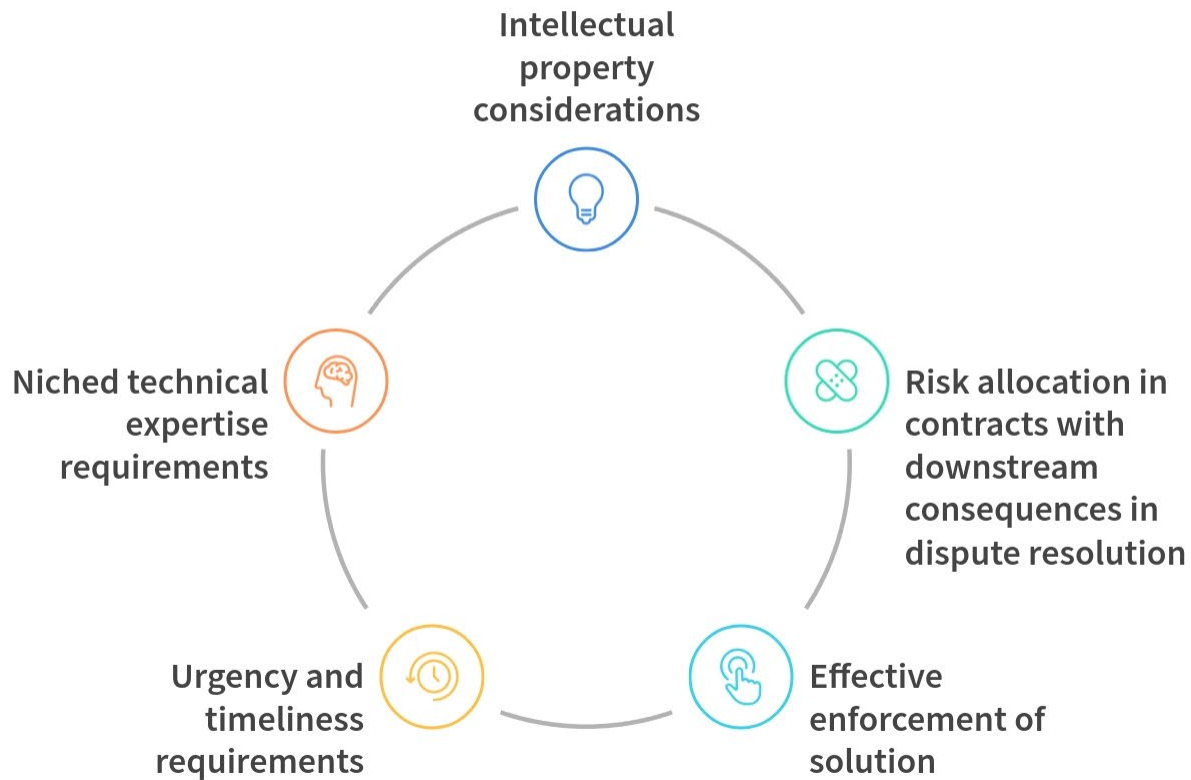


Involvement of public agency

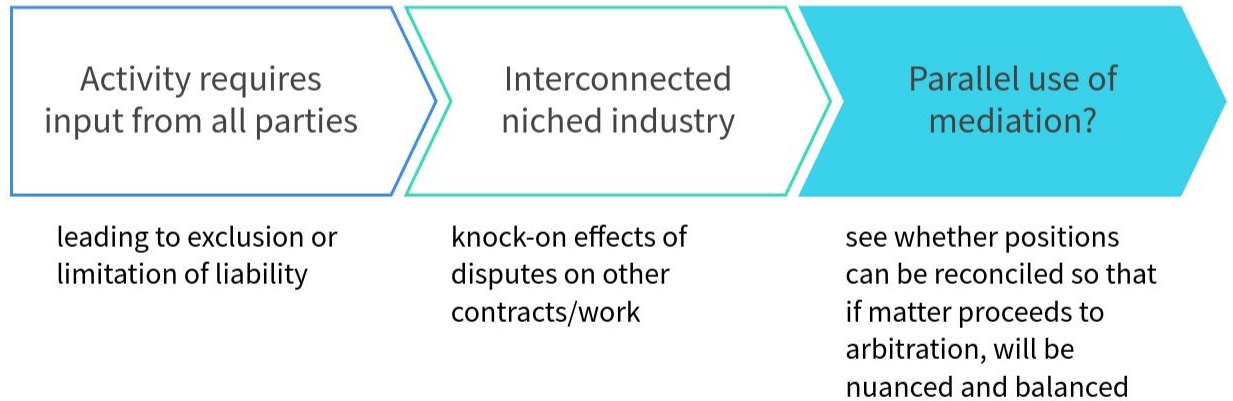


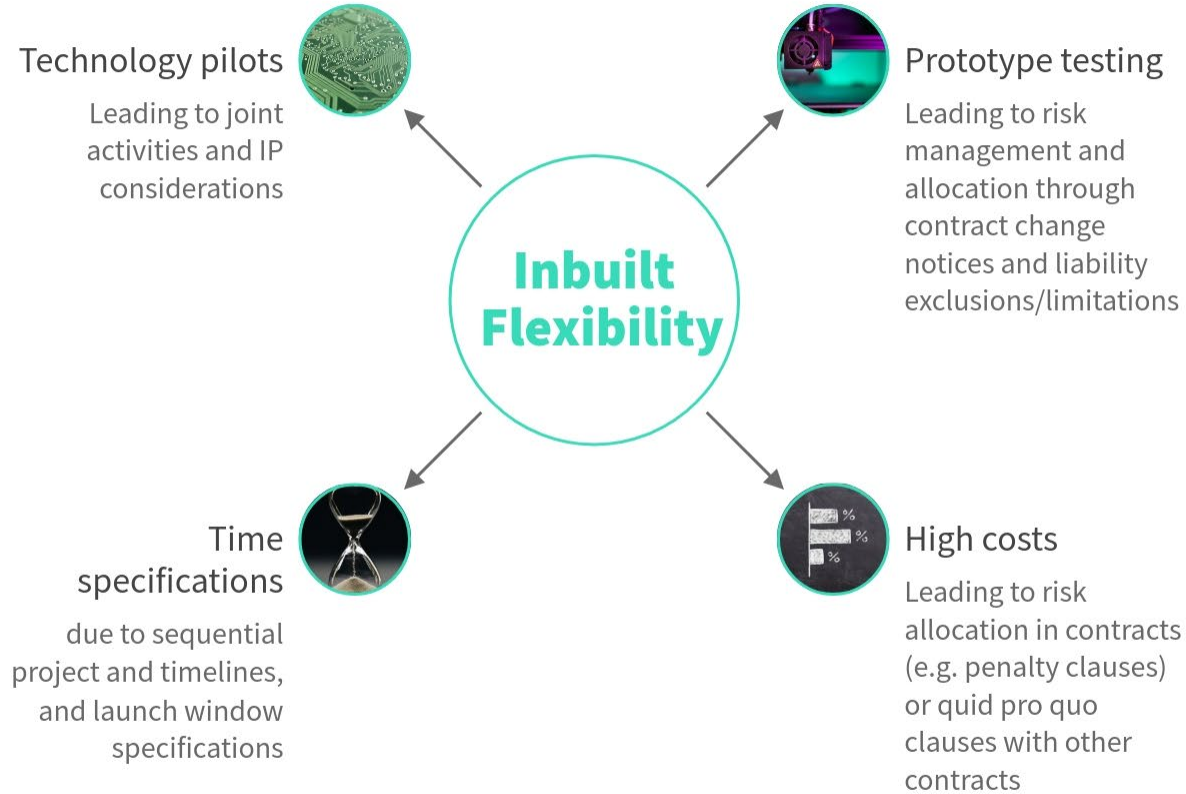
Public (international) law
considerations

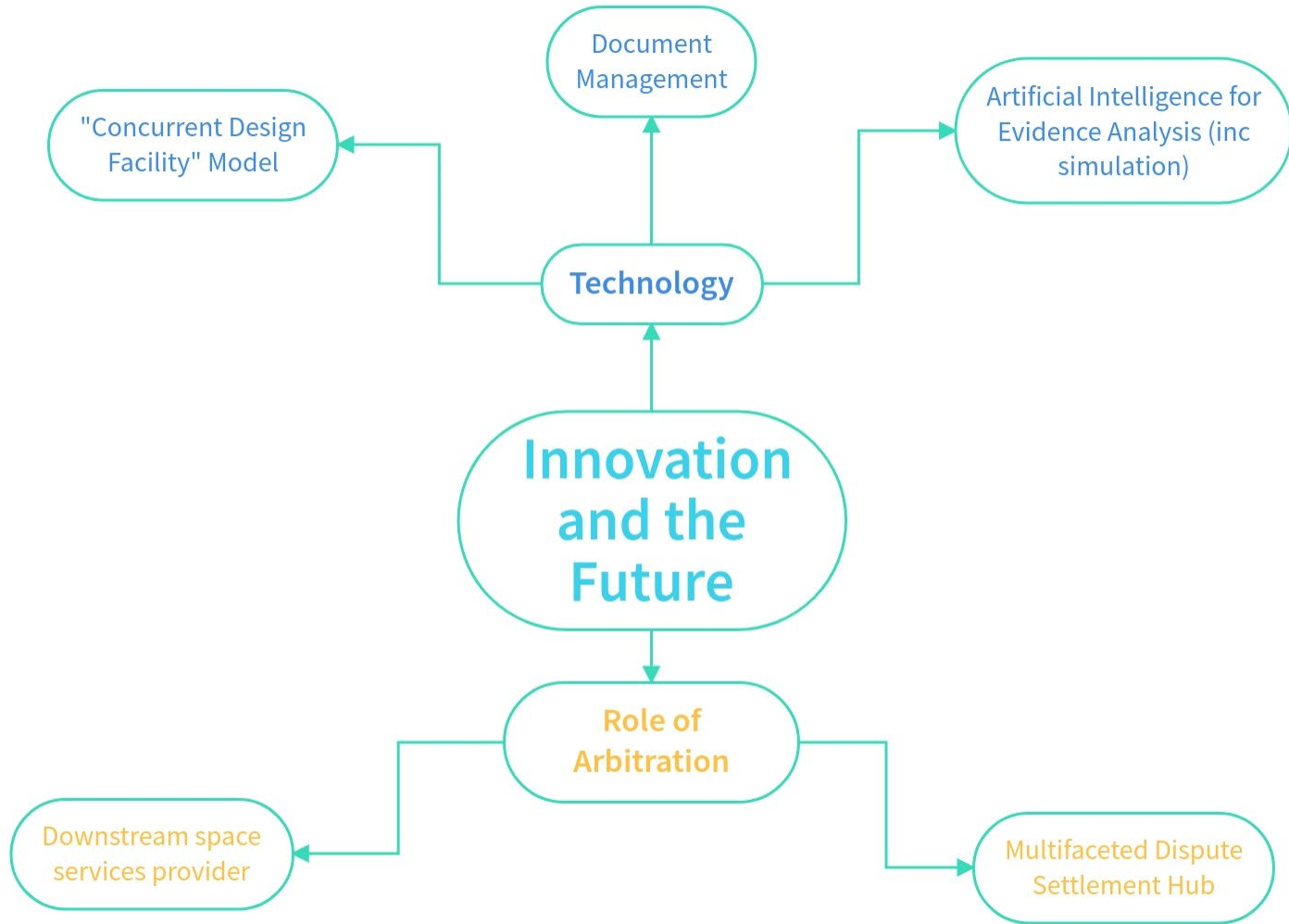
Technical nature of the dispute



Close and interconnected working matrix







Issues to Consider



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



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



Potential harm to third parties



States' international obligations



Remedy sought (and whether recognisable and enforceable)



Verification of implementation of award



Private international law considerations



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



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 arbitration 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?



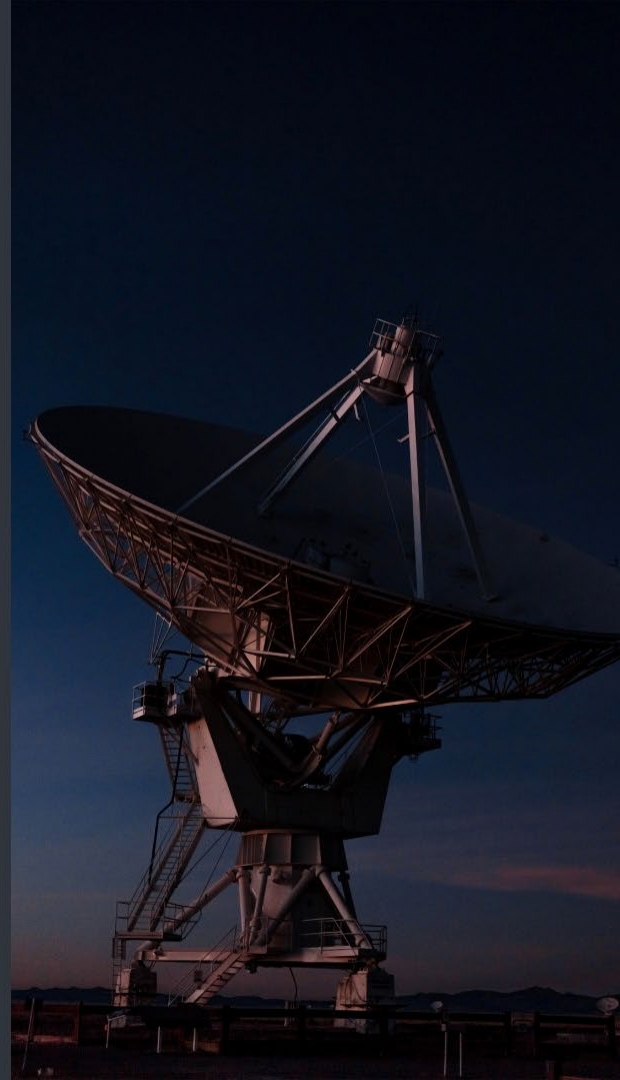


case

studies in arbitral awards

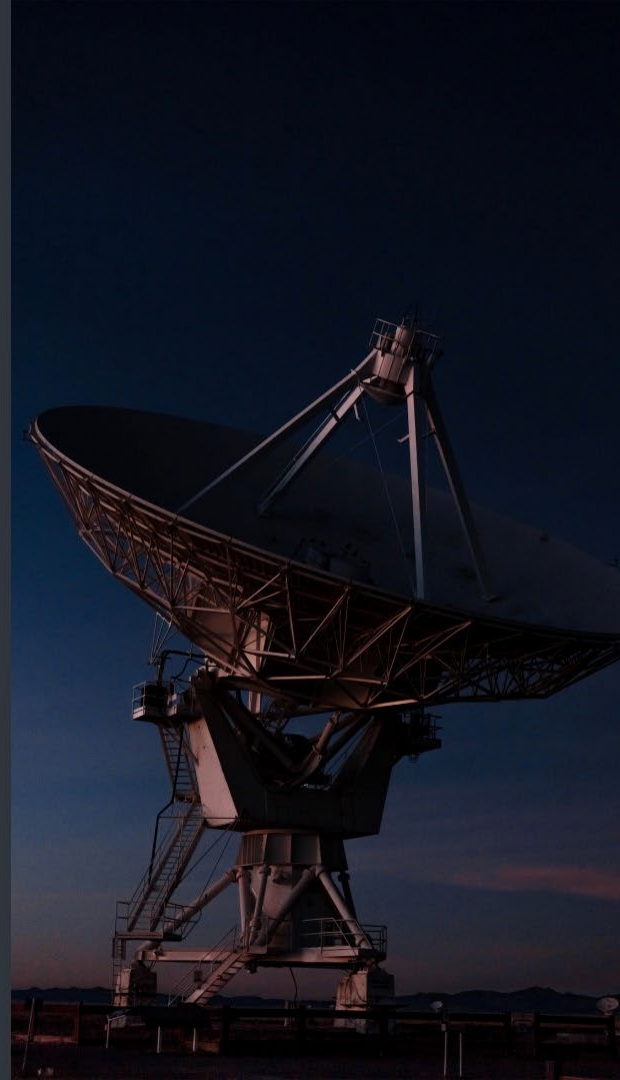
Devas v. Antrix

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



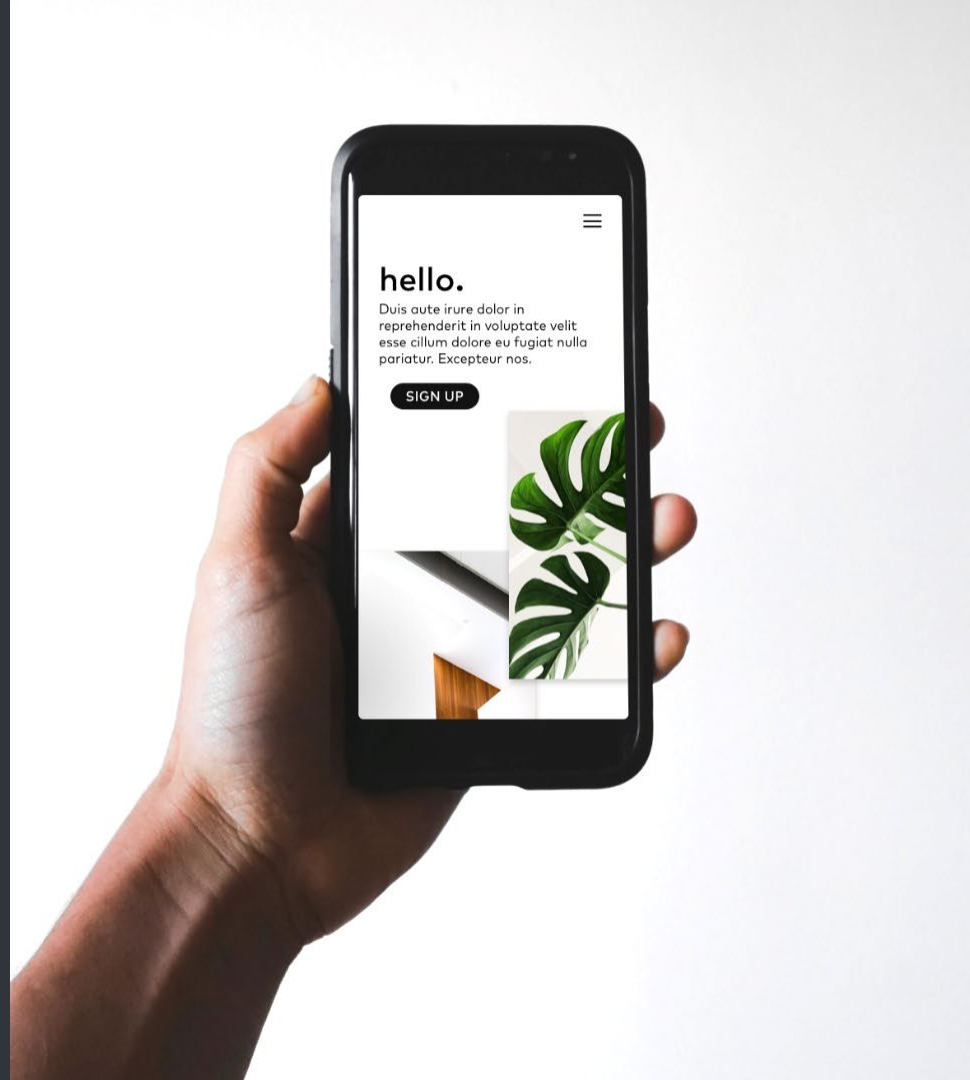
G.GohEscolar@nus.edu.sg



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



@GeriGohEscolar



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Outer Space Arbitration

Dr Gerardine Goh Escolar
Professor (Adj)

Faculty of Law | National University of Singapore

