

# A TALE OF TWO OCEANS

Governance of Terrestrial and Outer Space Commons

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# WHAT IS 'GOVERNANCE'?

- ◆ “Exercise of authority & control; method or system of government or management”
  - Over/of another’s activities – i.e. private industry & other ‘partners’
  - Although crucially involving states, broader than ‘government’ – also intergovernmental organizations
  - Usually with  $\approx$  clearly delineated *areas* where one of the public entities involved exercises authority & control

# STATES & BOUNDARIES...

- ◆ States like geographical clarity all the time...
  - Border conflicts among most omnipresent & vexing
    - Israel; Russia–Ukraine; Morocco–Spanish Sahara; ...
  - *Vice versa* conflicts on territories without clear control also among most omnipresent & vexing
    - ‘Failed states’ – Somalia; Lebanon; Libya; Iraq; Palestine?
  - More peacefully: internal sub-divisions of states
    - States within federations; provinces; municipalities
- ➔ Allows clear delineation responsibilities
  - Note also reciprocal respect for national sovereignty & non-intervention under UN Charter

# GOVERNANCE AND TERRITORY

◆ Western-European notion modern state

↔ Hugo Grotius (a.o.): ‘freedom high seas’

→ Three options legal status landmass / seas:

1. State territory: under single state’s sovereignty
2. No man’s land – but *terra nullius*
3. No man’s land – but *terra communis*

◆ Much more recently:

4. ‘Common heritage of mankind’ – also use = common
5. ‘Province of all mankind’ – ‘global commons-plus’

# GOVERNANCE OF THE SEAS (1)

- ◆ Basis: zone-by-zone system
- ◆ Originally: territorial waters ↔ high seas

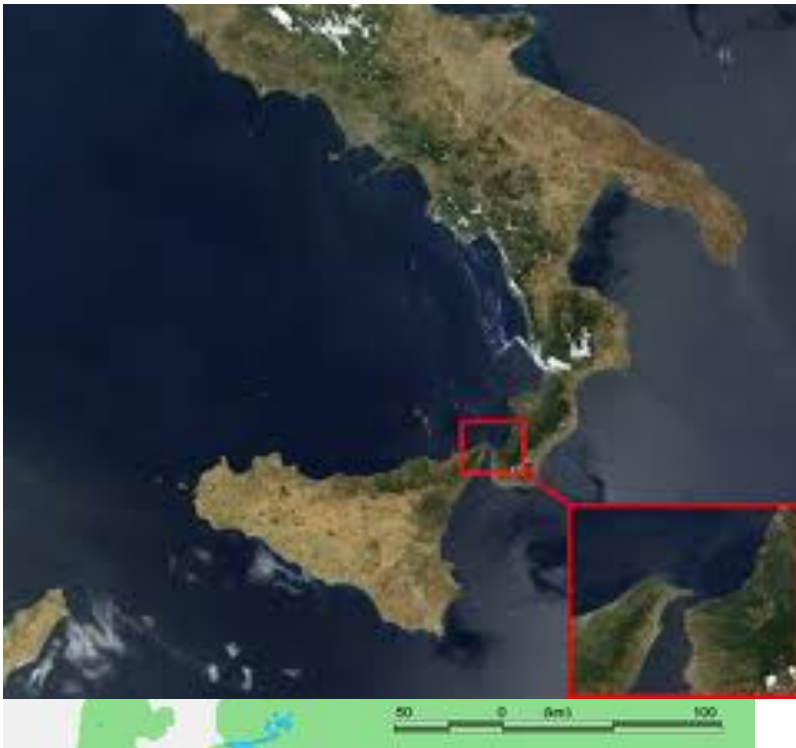


- 3 nm off-shore
- Rather absolute dichotomy → boundary  
*national state sovereignty–  
global commons*

# GOVERNANCE OF THE SEAS (2)

## ◆ Codification 1958 Geneva Conventions:

- 12 nm maximum off-shore
- Exceptions to dichotomy:



- ‘Innocent passage’ in territorial waters
  - Incl. high seas to high seas
  - Needs to be ‘*innocent*’
- Contiguous zone
  - 12 nm maximum off-shore (...)
  - Focused on enforcement
- Some straits special regime

# GOVERNANCE OF THE SEAS (3)

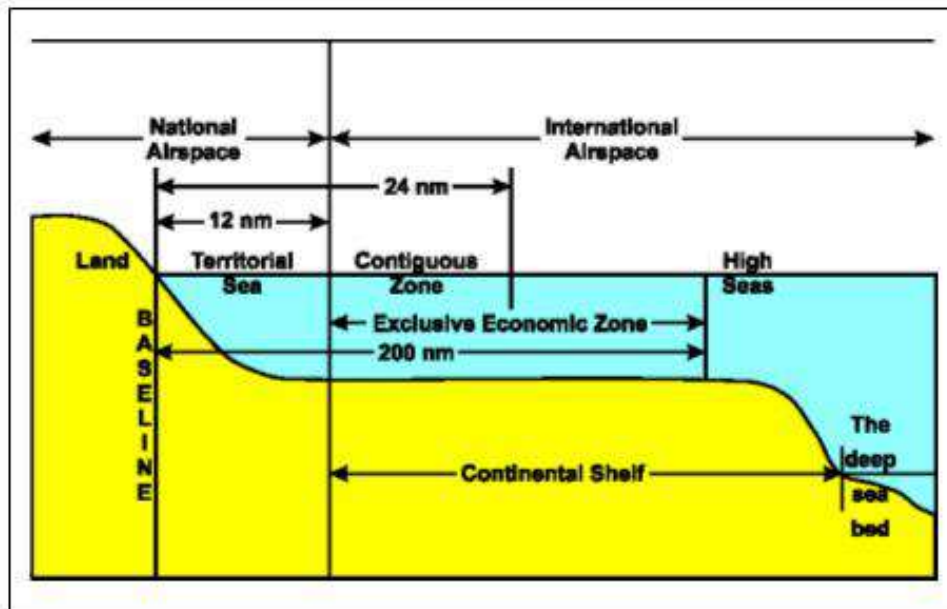
## ◆ Need to create more coherence

- 1958: four Geneva Conventions following UN Conference on the Law of the Sea (UNCLOS) I
    - Territorial Sea & Contiguous Zone; High Seas; Continental Shelf; Fisheries
  - 1960: aborted effort to update as per UNCLOS II
  - 1974–1982 UNCLOS III striving for single overarching regime
- UN *Convention* on the Law of the Sea, often also referred to as ‘UNCLOS III’



# GOVERNANCE OF THE SEAS (4)

## ◆ Increasing refinement under 1982 UNCLOS III



1. Territorial sea
2. Contiguous zone
3. Exclusive Economic Zone (sometimes Fisheries)
4. Continental Shelf
5. High Seas-proper

Figure 1 Maritime Zones  
(Schofield, 2003: 18)

# ZONE-BY-ZONE GOVERNANCE (1)

## 1. Territorial seas

- Definitively limited to 12 nm off-shore
- Territorial sovereignty → national jurisdiction & laws *on all feasible topics, issues & scenarios*
  - Only occasionally limited by general international law
- Extends to airspace above territorial seas
- Exception ‘innocent passage’ remains
- Exception ‘transit passage’ for ‘international straits’ added
  - Again high seas to high seas
  - Customary transit of old

# ZONE-BY-ZONE GOVERNANCE (2)

## 2. Contiguous zone

- Now limited to 24 nm off-shore
- Functional, (quasi-)territorial *application* of national jurisdiction & laws *only* on enforcement compliance

## 3. Exclusive Economic (/Fisheries) Zone

- Limited to 200 nm off-shore
- Functional national *jurisdiction* – *only* on living & seafloor mineral resource exploitation
  - If Exclusive Fisheries Zone: functional national *jurisdiction* *only* on living resource exploitation
- Otherwise rules high seas already apply

# ZONE-BY-ZONE GOVERNANCE (3)

## 4. Continental Shelf

- Minimum 200 nm off-shore, unless actual continental margin extends beyond – then up to 350 nm off-shore
- Functional national *jurisdiction only* on seafloor mineral resource exploitation
- In all other respects rules high seas already apply →

## 5. High seas-proper

- No exercise of territorial sovereignty over any part of the high seas
- Fundamental freedoms high seas – *global commons*

# HIGH SEAS GOVERNANCE (1)

- ◆ Freedoms of the high seas = baseline
  - Freedoms of navigation; of overflight; to lay submarine cables & pipelines; to construct artificial islands & other installations permitted under international law; fishing; & of scientific research
- ◆ *Limitations* to freedoms only as per *international law*
  - Only further fundamental obligation under UNCLOS III: use for peaceful purposes
  - Additional regimes limiting freedoms as per treaty law and/or customary international law

# HIGH SEAS GOVERNANCE (2)

- Special regime for the exploitation of mineral resources of the ocean floor: ‘common heritage of mankind’
  - *Res communis* but with international regime ruling exploitation replacing freedom high seas
  - UNCLOS III: includes system of benefit-sharing & mandatory transfer of technology
    - Unacceptable to major Western states →
  - 1994 New York Agreement: dilutes net effect of ‘common heritage of mankind’ considerably

# HIGH SEAS GOVERNANCE (3)

- Special regimes for preservation of fish
  - Limiting freedom high seas in terms of living resource exploitation
  - 1993 Rome Agreement to promote compliance with international conservation and management measures by fishing vessels on the high seas
  - 1995 New York Agreement on conservation and management of straddling fish stocks and highly migratory fish stocks
    - Further elaborating UNCLOS III

# HIGH SEAS GOVERNANCE (4)

- Special regime for preservation of marine environment & mitigation of pollution
  - 1973 London Convention for the prevention of pollution from ships as modified 1978 ('MARPOL')
    - For example imposing double-hull obligations on tankers
- Special regime for search & rescue at sea
  - 1974 London Convention for safety of life at sea ('SOLAS')
  - Establishment various satellite systems for support ...



# SPECIAL GOVERNANCE TOOLS

- ◆ Intergovernmental organizations
  - Esp. International Maritime Organization (IMO) can develop standards, guidelines, even treaty texts
- ◆ Nationality of ships → national jurisdiction on quasi-territorial basis on board
- ◆ Nationality of companies → national jurisdiction on basis of registration & seat company
- ◆ Nationality of persons → national jurisdiction

# SPECIAL CASE: ANTARCTICA

- ◆ Claims of *terra nullius* → occupation vs. *terra communis* →
  - 1959 Antarctic Treaty froze the ‘territorial question’
  - Since then further treaties protecting the environment including the eco-system at large resulted in *de facto* qualification Antarctica as *terra communis* – exercise of national jurisdiction unilaterally hardly possible
    - 1972 Convention on conservation Antarctic seals; 1980 Convention on conservation of Antarctic marine living resources; 1988 Convention on regulation Antarctic mineral resource activities; 1991 Protocol environmental protection

**2001 - 2015**

**THE DAWN OF  
SPACE TOURISM**

# GOVERNANCE OF SPACE (1)

## ◆ 1967 Outer Space Treaty

- Confirms status outer space as ‘global commons-*plus*’
  - ‘Province of all mankind’; freedom of exploration & use (incl. exploitation) for states; no ‘national appropriation’
  - *Limitations* to freedoms only as per *international* law – as per customary law or per treaty ...
    - E.g. prohibition orbiting / stationing weapons mass destruction
  - Responsibility of states for conformity national private activities with international space law
  - Liability of states for damage caused by private activities
  - Registration space objects allows for jurisdiction

# GOVERNANCE OF SPACE (2)

- ◆ Further limitations to international freedom:
  - UN Charter & general international law
    - Further to Outer Space Treaty: as *lex generalis*
  - UN treaties elaborating Outer Space Treaty
    - 1968 Rescue Agreement; 1972 Liability Convention; 1975 Registration Convention (& 1979 Moon Agreement...)
  - Test Ban Treaties as for nuclear (weapons) explosions
  - Number of ‘specialized’ treaty regimes
  - UN Resolutions giving rise to customary law

# GOVERNANCE OF SPACE (3)

- ◆ Too *few* limitations: issue of ‘space debris’
  - No prohibition creation ‘space debris’ in UN treaties
    - Chinese ASAT test (2007)
    - US downing of USA-193 (2008)
  - Only requirement, strictly legally speaking, to inform others in advance, if serious harm could result
  - Liability for damage caused by ‘space debris’
    - Identification problem
  - No concept of ‘abandonment’ in outer space
  - No concept of ‘salvage rights’ in outer space

# GOVERNANCE OF SPACE (4)

## ◆ Mitigation of ‘space debris’

- Inter-Agency Space Debris Coordination Committee
    - 2002 Guidelines → 2007 UN Resolution
    - Increasingly used in *national* licensing processes as part of licensing requirements
    - Two protected regions (‘zones’): Low-Earth Orbit (< 2,000 km) & Geo-Stationary Orbit (35,586–35,986 km)
1. Preventing on-orbit break-ups
  2. Removing space objects at end of mission
  3. Limiting release objects during normal ops

# GOVERNANCE OF SPACE (5)

- ◆ Hardly any regulation: harvesting of celestial bodies' mineral resources
- ◆ Following moon landings 1969–1972, next step – mining of resources – seemed imminent
- ◆ Need for regime elaborating Outer Space Treaty





# GOVERNANCE OF SPACE (6)

- ◆ 1979 Moon Agreement: also for other celestial bodies such as asteroids
    - Exploration & use moon = ‘province of all mankind’
      - ‘Use’ = (incl.) ‘(commercial) exploitation’?
    - Moon & its natural resources = ‘common heritage of mankind’
      - No further elaboration of regime *à la* UNCLOS III
      - Yet, following UNCLOS III, seemed to point to future benefit-sharing & transfer of technology
- Only 16 ratifications, none of the major spacefaring nations...

# GOVERNANCE OF SPACE (7)

- ◆ Currently two US companies gearing up to start harvesting such resources (on asteroids)
  - Prohibition of ownership over lunar resources seemingly limited to such resources ‘in place’
    - No right to *a priori* reservation of harvesting plots
    - No guarantee of acceptance by other states
- ◆ Possible solutions:
  - Unilateral domestic regimes under original UNCLOS III
  - International regime *à la* New York Agreement

# OUTER SPACE VS. AIRSPACE

The background features a vertical axis on the left representing altitude in kilometers (0 to 1000) and a horizontal axis at the bottom representing temperature in degrees Celsius (-100 to 60). The atmosphere is divided into several layers: troposphere (0-10 km), stratosphere (10-50 km), mesosphere (50-85 km), thermosphere (85-600 km), and exosphere (600-1000 km). A red line shows the temperature profile, which decreases in the troposphere, increases in the stratosphere, decreases in the mesosphere, and increases in the thermosphere. Various aircraft and spacecraft are depicted at different altitudes: a hot air balloon and airplane in the troposphere, a commercial jet in the lower stratosphere, a military jet in the upper stratosphere, a rocket in the lower thermosphere, and a satellite in the upper thermosphere.

◆ National sovereignty over airspace *vs.* global commons-character outer space

→ Need for a boundary between them!

- Functionalists *vs.* spatialists
- General lack of agreement on altitude
- Convergence on 100 km:
  - Several national / regional space laws
  - State proposals & UN questionnaires
  - Non-legal state awards
  - Private organizations & private space tourist operators

# SPECIAL GOVERNANCE TOOLS (1)

## ◆ Intergovernmental organizations

- United Nations: discussing new (legal) developments
- ITU: regulating access to frequencies – & orbits
- Intergovernmental satellite operators
  - Prior to privatization: INTELSAT, INMARSAT, EUTELSAT
  - Still intergovernmental: INTERSPUTNIK, ARABSAT, EUMETSAT
- European Space Agency
- WTO & European Union: regulating access to satellite communication services markets

# SPECIAL GOVERNANCE TOOLS (2)

## ◆ National space legislation

- Using remote-controlled character of most space activities for application of *territorial* jurisdiction
- Applying *nationality-based* jurisdiction to nationals, including private companies, active in space
- Applying *registration-based* jurisdiction on a *quasi-national* basis to space objects
- Implementing international obligations relevant state – further to state responsibility & state liability
- Implementing national legal concerns & policies

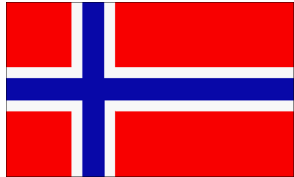
# NATIONAL SPACE LAWS (1)

- ◆ United States: multiple Acts
  - 1934 Communications Act / 1970 FCC Order
    - *Operation satellite for communication purposes* from US territory / vessels / aircraft requires license FCC
    - Payload approval *i.a.* references space debris guidelines
  - 1984 → 1992 Land Remote Sensing Acts
    - *Operation satellite for remote sensing purposes* from within US jurisdiction / by US nationals requires license NOAA
  - 1998 Commercial Space Act
    - Marginally regulates several commercial space sectors

# NATIONAL SPACE LAWS (2)

- ◆ United States: multiple Acts – *ctd.*
  - 1984 Commercial Space Launch Act
    - *Private launch* of any space object from within US jurisdiction / by US nationals requires license FAA
    - Same – but separately – for *operation private launch site*
    - Payload approval taking care of US safety & security concerns & international obligations
    - 1988 Amendments included effectively sharing of international third-party liability claims US launches
    - 2004 Amendments applied same regime to *manned launches using re-usable vehicles*, so including re-entry

# NATIONAL SPACE LAWS (3)



Norway

- 1969 Act on Launching Objects etc.
  - Permission required to *launch* from territory, vessels & aircraft / by citizens & companies



Sweden

- 1982 Act on Space Activities
  - License for *any space activities* from territory / by citizens & companies
  - Exception: *launches of sounding rockets*

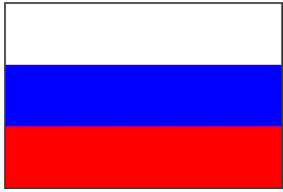


UK

- 1986 Outer Space Act
  - License required for *all space activities* by nationals & companies
  - Same for *launch procurement*



# NATIONAL SPACE LAWS (4)



Russia

- 1993 Law on Space Activities
  - License required for *all space activities* from territory / elsewhere by citizens & companies
  - Possibly same for *use space technology*



South Africa

- 1993 Space Affairs Act
  - License required for *launches* from territory / elsewhere by nationals
  - *Other space activities*: for nationals only



Ukraine

- 1996 Law on Space Activities
  - License required for *all space activities* on territory / by nationals

# NATIONAL SPACE LAWS (5)



Australia

- 1998 Act about space activities
  - Licenses / permits / authorizations / certificates required for *launches* by nationals / from territory



Brazil

- 2001 Edict & enclosed Regulation
  - License required for *launches* from territory by nationals & foreigners



Belgium

- 2005 Law on [space] activities etc.
  - Authorization required for *all space activities* from territory / quasi-territory
  - If international agreement on the issue, also required by nationals

# NATIONAL SPACE LAWS (6)



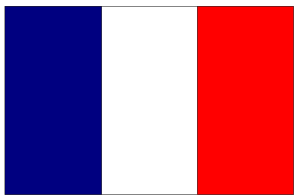
South Korea

- 2005 Space Development Promotion Act
  - Licenses required for *launches* from territory / elsewhere of launch vehicles owned by nationals



Netherlands

- 2007 Law [on space activities] etc.
  - License required for *space activities* from territory
  - Possibly under circumstances extended to *space activities* conducted elsewhere



France

- 2008 Law on Space Operations
  - Authorization required for *launches* from territory / by nationals
  - Same for *procurement of launches & command over space objects* by nationals

# NATIONAL SPACE LAWS (7)



- 2011 Federal Law on Authorization etc.



Austria

- Authorization required for *space activities* from territory / by nationals

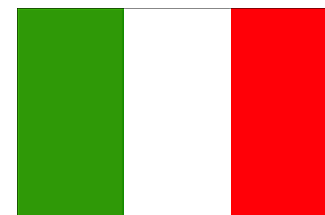
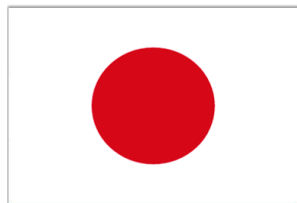


Kazakhstan

- 2012 Law on Space Activities

- License required for *space activities* by nationals – & ‘in accordance with (further) legislation’...

## ◆ Major states missing so far...



# WHERE TWO OCEANS MEET...

1. Legal theory – beyond similarities territorial waters–airspaces (‘sovereign national territory’) & high seas–outer space (‘global commons’)
2. Launch activities from ocean platforms
3. Special international organization operating satellites for various maritime purposes
4. Use of satellites for fishing & environmental monitoring & enforcement

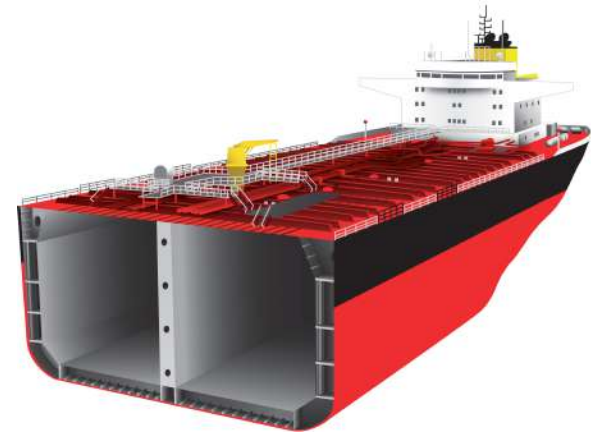
# (MORE) LEGAL THEORY

- ◆ Largely from the law of the sea to the law of outer space
- ◆ In terms of space governance:
  - Suggestions for ‘intermediate’ zones (cf. contiguous zone, EEZ) (...)
  - Suggestion to use principle of factual control (cf. cannon shot rule) (...)
  - Discussion on ‘common heritage of mankind’ (*P.M.*)
  - Discussion on fears of ‘flags of convenience’ (...) →

# FLAGS OF CONVENIENCE...

## ◆ Law of the sea

- Providing ship with registration → nationality in principle sovereign prerogative of states
- Only limitation under law of the sea conventions: ‘genuine link’ ship with state of nationality
  - Hope was to stimulate flag states to take their duties seriously, in terms of imposing requirements on crew licensing, ship certification & insurance coverage
  - In many cases however ‘flags of convenience’ came about, giving rise to many accidents & much damage



# FLAGS OF CONVENIENCE?

- ◆ Beauty of space (law) in comparison
  - *States* responsible for national space activities & liable for damage they may cause
    - Absolute liability for damage on earth
    - No principled limits to liability
  - Launch is most dangerous phase – enlightened self-interest calls for prudent licensing
    - Most damage likely to occur to launch state itself
  - Strategic (economic/military/prestige) aspects almost always involved, too





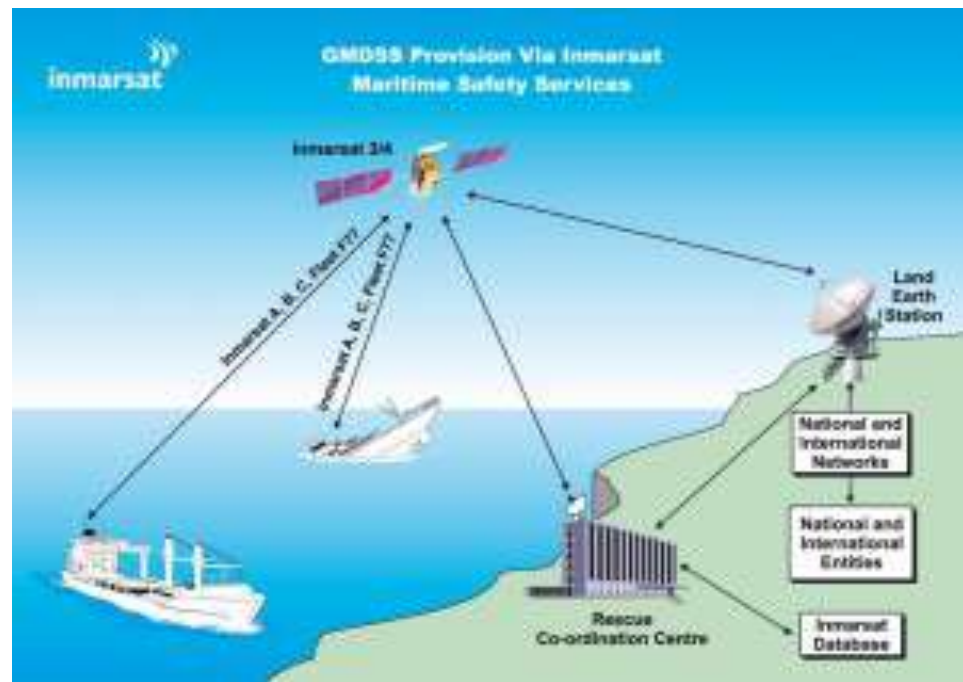
# SEA LAUNCH

- ◆ International consortium making use of freedom of the high seas to launch...
  - US companies lead partner
- ◆ Law of the sea governance:
  - Platform: jurisdiction depends on national registration (= US)
  - Right to establish safety zones
- ◆ Law of space governance:
  - International liability following facility (= US)



# INMARSAT (1)

- ◆ Intergovernmental consortium offering satellite capacity for maritime (safety) communications
- ◆ Law of the sea governance:
  - Requirements for ships to carry appropriate transponders
- ◆ Law of space governance:
  - Requirements for INMARSAT to ensure coordination of use of frequencies & orbits



# INMARSAT (2)

- ◆ Developments in the 1990s:
  - Miniaturization of technology – ‘hand-helds’
  - Liberalization of satellite communication markets
  - Privatization of satellite communication operators
  - Accompanying legal developments:
    - EU Satellite Directive (1994)
    - WTO GATS Fourth protocol (1997)
    - US ORBIT Act (2000)
- ◆ Privatization of INMARSAT
  - Private commercial satellite operator ‘Inmarsat’
  - Small supervisory IGO ‘ITSO’

# INMARSAT (3)

- ◆ Hybrid governance structure:
  - Under supervision ITSO Inmarsat still required to provide Global Maritime Distress & Safety Services
  - Unless other service provider would take over, as subject to authority of International Maritime Organization
  - Access to frequencies & attendant orbital slots for Inmarsat satellites now arranged in ITU context by UK as state of nationality & business operation
  - Liability to be allocated through mechanism of Liability Convention as focused on the launch

# MONITORING THE LAW (1)

## ◆ Governance of fishing quota

- Using satellite navigation to detect fishing vessels illegally entering other states' fishing grounds
  - E.g. 1993 Rome Convention: “Parties (...) shall, in particular, exchange information, including evidentiary material, relating to activities of fishing vessels in order to assist the flag State in identifying those fishing vessels flying its flag reported to have engaged in activities undermining international conservation and management measures”
  - Vessel Monitoring System made obligatory under various international, EU and national arrangements → through quasi-territorial jurisdiction flag state over ship
    - E.g. 1997 EC Council Regulation No. 686/97

# MONITORING THE LAW (2)

- ◆ Governance of environmental protection at sea
  - Using satellite navigation to detect oil spills
    - E.g. 1973/78 MARPOL Convention: “Parties (...) shall cooperate in the detection of violations and the enforcement of the provisions of the present Convention, using all appropriate and practicable measures of detection and environmental monitoring, adequate procedures for reporting and accumulation of evidence.”
    - Application via territorial, subsidiary national jurisdiction
    - 1996 Song San-case: pollution Singapore
      - Detected by satellite – validated on ‘ground’
      - Criminal charges, including under MARPOL Convention
      - Fines S\$ 400,000 for pollution, S\$ 50,000 for failure to keep book

# MONITORING THE LAW (3)

- ◆ Environmental monitoring: EU case study
  - *European Commission v. United Kingdom* (2009):
    - Commission claimed UK was in breach of obligations concerning urban waste-water treatment in the Humber estuary, emptying into the North Sea, using satellite images showing high concentration of algae
    - UK attacked images as being non-reliable
    - European Court dismissed objection
      - “Contrary to what the United Kingdom asserts, the capture of images by remote sensing cannot, as such, be regarded as unreliable, the United Kingdom itself indeed having recourse to such images to support certain of its arguments concerning other areas at issue, and it therefore constitutes a means capable of revealing the existence of accelerated growth of algae and other plant life.”

# CONCLUDING REMARKS

- ◆ Two oceans of the high seas and outer space similar in many respects, esp. legal ones
  - Some exchange of concepts, esp. from the high seas to outer space
- ◆ Technically & operationally, however, fundamentally different environments
  - Outer space law also often ‘borrows’ from law of Antarctica, air law & telecommunications law
- ◆ Some interesting overlaps & connections between the two