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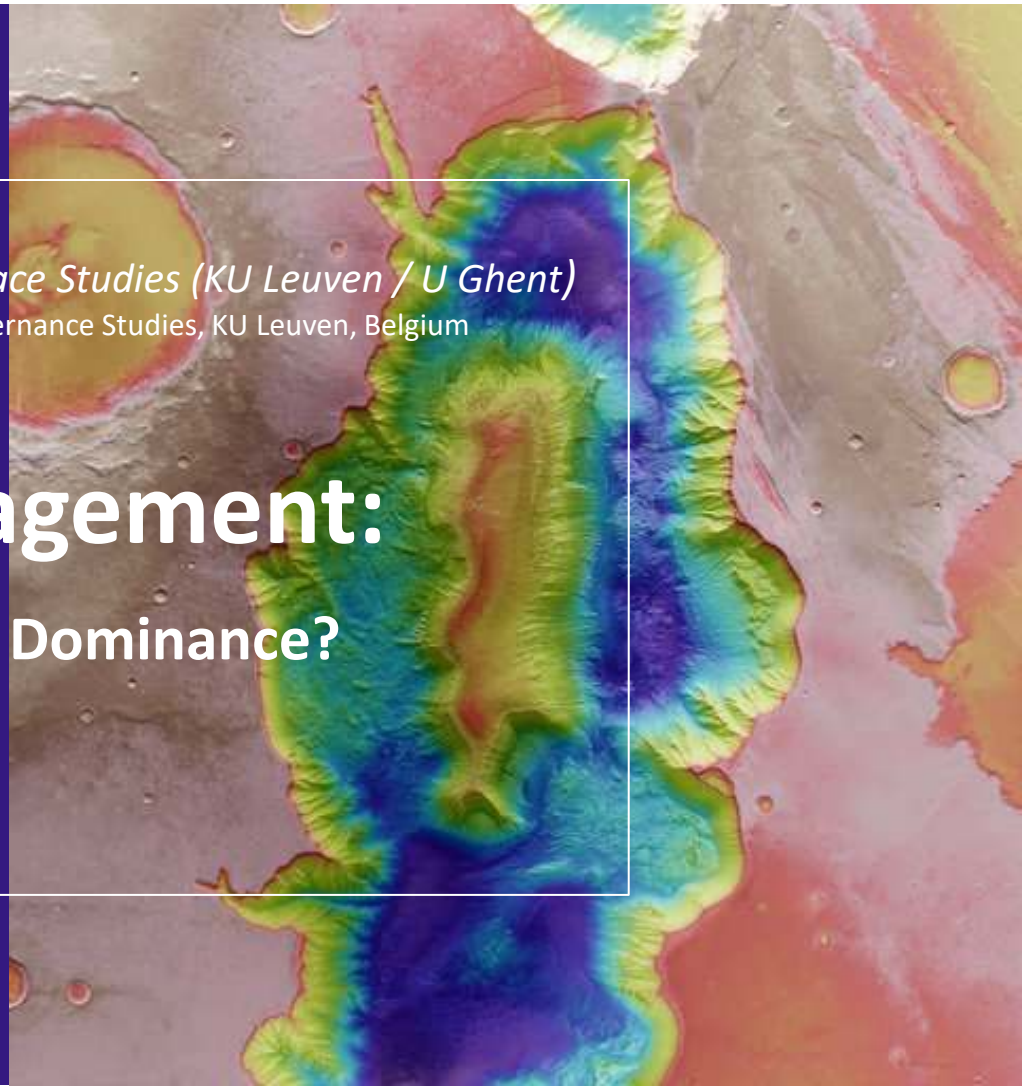
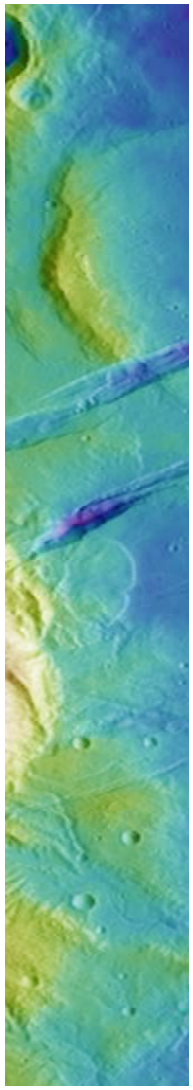
Space Traffic Management:

Paving the Way or Establishing Dominance?

#switchtospace --- 5 October 2020





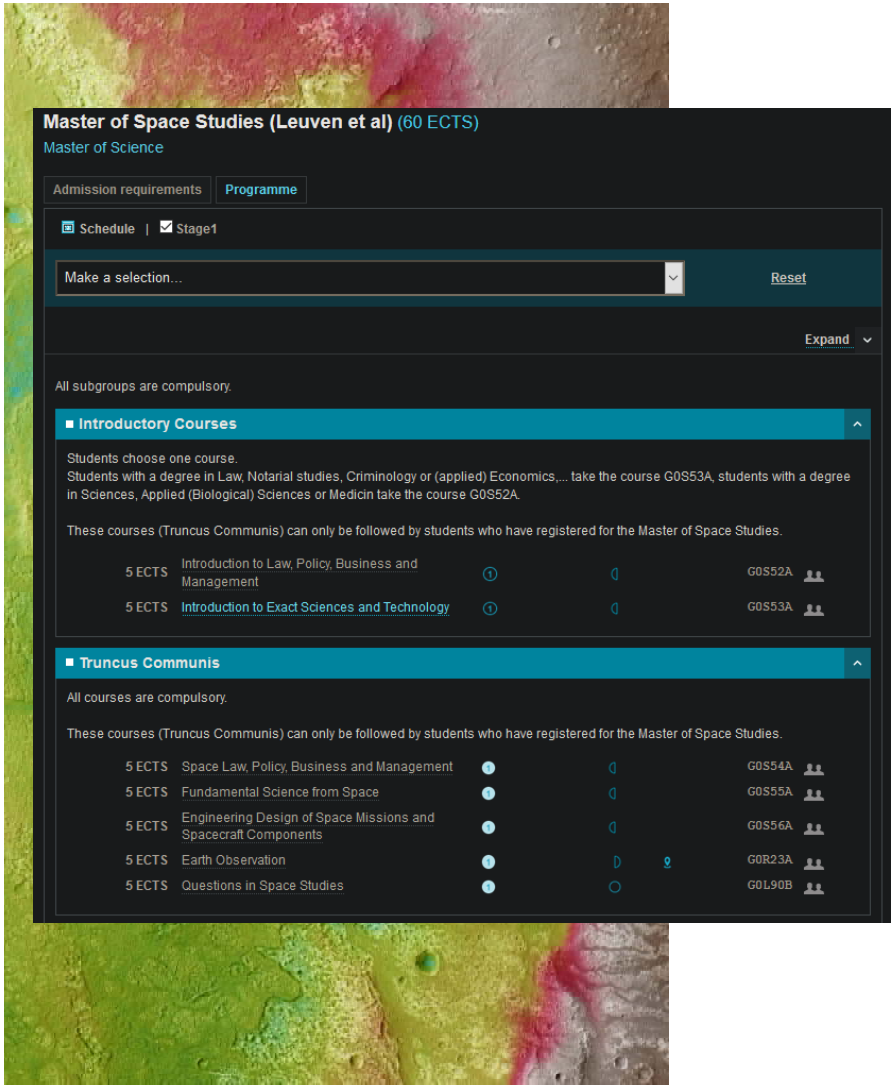
Space careers

Great time to get into the space sector

- **Paradigm shift**: unprecedented developments
- → Militarization
- → Commercialization
- → Increased ‘traffic’ / debris
- → Wave of national space legislations

Need for interdisciplinary space experts

- **Space is transversal**: links to myriad activities/fields
- → STEM *and* Humanities
- → High-tech R&D and scientific research
- → Navigating markets and commerce
- → Creating and applying space policy and law



Master of Space Studies

- **Interdisciplinary Advanced Master's Programme**
- → Introductory courses
- → Truncus Communis (Common Programme)

- → *Space lawyers & orbital mechanics*
- → *Engineers & ITU regulations*
- → *Astrophysicists & right to starlight*

Specialization: three profiles

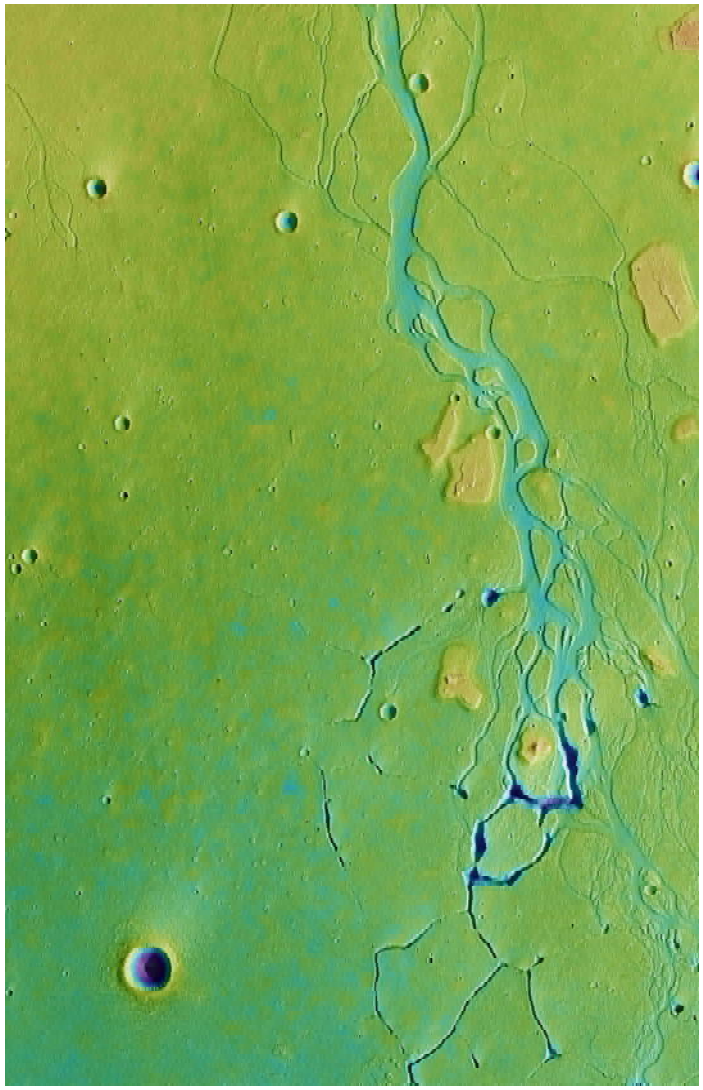
- **According to background**
- → Space Law, Policy, Business and Management
- → Space Sciences
- → Space Technology and Applications
- → Master's Thesis Programme

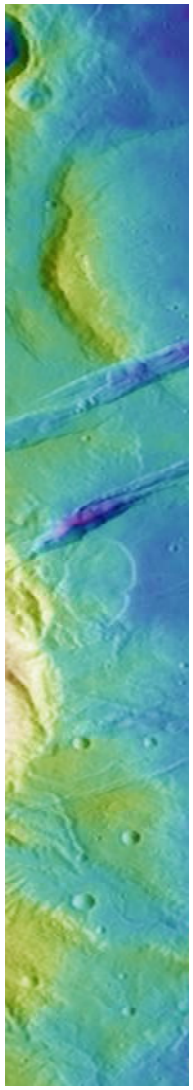
Alumni

- Yours truly
- ESA
- EDA
- EU (Commission, Galileo, …)
- Various universities
- Private industry
- → launchpad to a space career

Space is here to stay

- **<u>Global society depends on space</u>**
- → *No longer just a few satellites and a moon mission*
- → Management of orbital use imperative
- → New companies, agencies and authorities
- → Highly international and future-oriented





Space Traffic Management (STM)

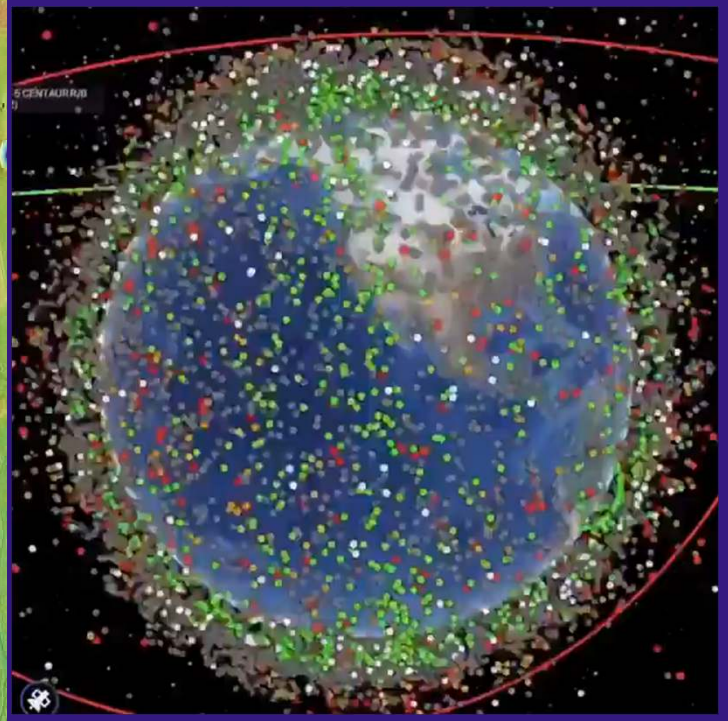
Research (PhD) and teaching (MSS) focus

- **Everything basically still needs to be defined, created, … !**
- → Unique and unprecedented situation
- → ‘Droit astronautique’
- → Cf. History of Law of the Sea (e.g. Grotius)
- → *Need not only development but also* ***critical reflection, analysis and participation***

Why STM?

- **Space is large *but not unlimited***
- → Orbital space: limited 4-D (spatiotemporal) resource
- → Avoid interactions between objects serving essentially unlimited number of functions
- → LEO is *highly congested* and *highly dynamic*
- → Open access and freedom of use (Art. I OST)
- → STM: just for the few or for the benefit of all countries?

Orbital Use



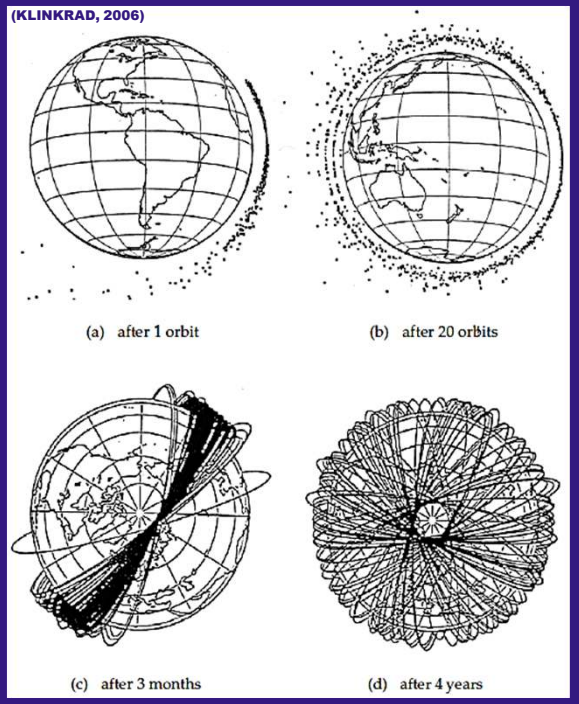
~ # Space Objects
>10cm: ~ 30.000 (8000 tons)
>1cm: ~ 750.000
>1mm ~ 170.000.000

→ **3 Objects:**
- **30% RSO**
- **13% since Sputnik I**

Collision

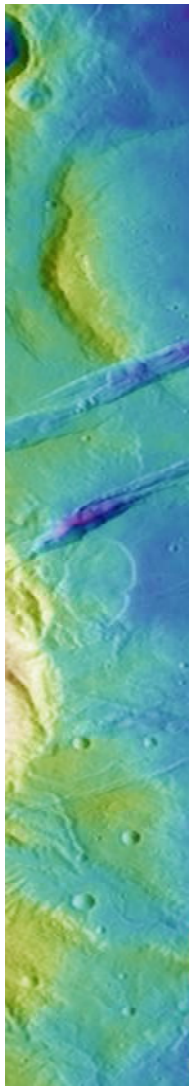
→ **Essentially unlimited variety of international actors and functions**

→ **E.g. *Starlink-Aeolus***



→ **Highly interconnected**
- **Highly dynamic**
- **Chaotic**
- ***Short-term*: damage**
- ***Long-term*: Kessler**

→ **Collective action problem**



US Space Policy Directive-3 (June 2018)

- " … the planning, coordination, and on-orbit synchronization of activities to enhance the safety, stability, and sustainability of operations in the **space** environment."

STM goes to the core of orbital use

- **Powerful role in shaping STM = power over orbital space**
- → U.S.: Military, SST/SSA, Starlink, …
- → Deadlock in UN COPUOS?
- → International rights and responsibilities?
- → → Need for SST / SSA
  - Competition or cooperation? (Quid Europe?)
- → Cf. Law of the Sea (centuries: colonial conflict)
- → STM: at the heart of new forms of global governance and/or struggle for actual domination or ideological control of orbital space

Space Traffic Management (STM)

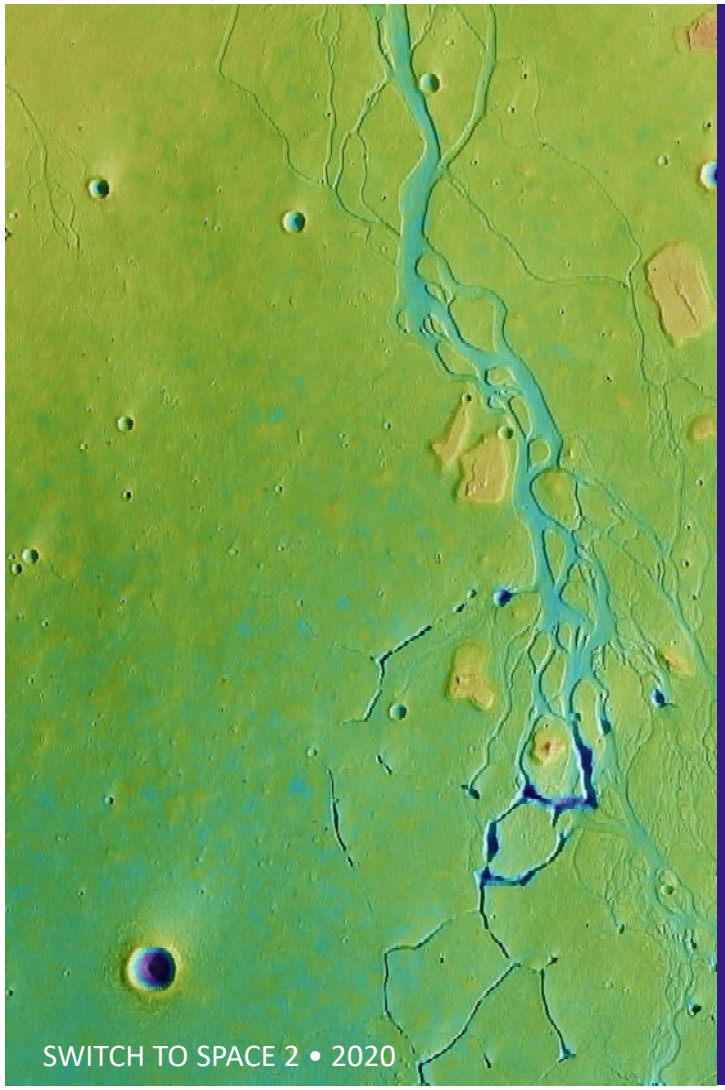
(Inter)national system to manage orbital space?

- → National vs International
- → Cooperation or conflict?
- → New Cold War?

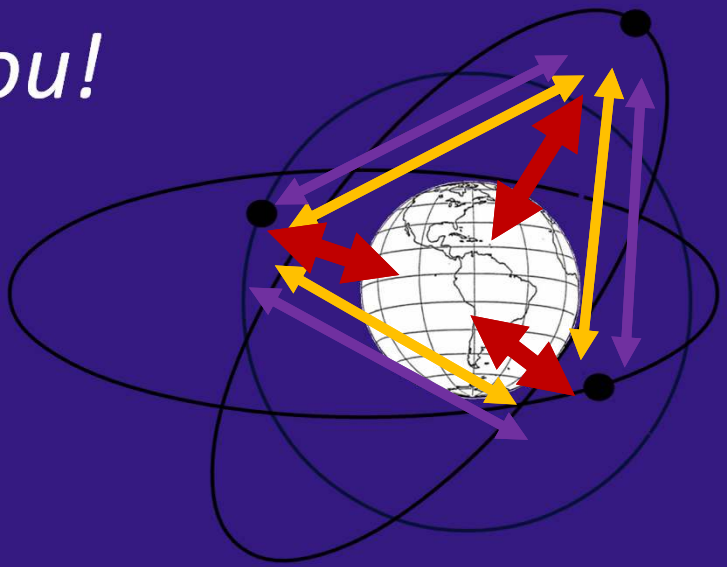
A lot of unknowns and uncertainties
… so a lot of possibilities!

Questions: politically, legally, scientifically, technically, …

- → What is ‘space debris’? What is ‘space traffic’?
- → Who is involved – will they agree to a system?
- → Which national and international interests?
- → Current and future STM/SSA mechanisms?
- → Will STM be fair, or will it favour hegemony and dominance in orbital space for a few nations?



Thank you!



Structure & Principles of Orbital Space Law

1 ***Supra**territoriality*

2 ***Atomization** of Sovereignty*

3 ***Static Risk** Principle with **Dynamic Outcomes***