MASARYK UNIVERSITY
Department of International Relations

Academic year 2024/2025 | Spring Term
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4 ETCS

Space Security:

Between strategic domain and capitalist sanctuary

Annotation

The course will provide an in-depth exploration of space security from the national security perspective, starting with an overview of outer space's unique physical characteristics and how they differ from planetary territories from a strategic perspective. It will delve into four theoretical perspectives on space security and their implications for governance at various levels. The course will also cover international space law, focusing on the five main treaties and emerging non-binding instruments. Additionally, it will address the management of space territories such as the Artemis Accords, the distinction between militarization and weaponization of space, and the evolving role of private entities in space operations. The course will conclude with discussions on natural space security threats, the impact of commercial space activities, and the future of space governance.

The main questions and topics which we will discuss are:

- How does space influence thinking about national security due to its specific characteristics?
- How do states cooperate or compete in space, ranging from the militarization to the weaponization of space to cooperation?
- Does international space law effectively govern space activities?
- What does the new wave of commercialization of space and the new ambitions of superpowers mean for the challenges of space governance?
- How are space hazards governed by states, and what role does the international community play in their governance?
- What are the visions of desirable future space governance, and do these visions have the potential to materialize and influence the way we govern Earth?

The course aims to acquaint students with fundamental space security principles and threats to national security while demonstrating how space can influence national politics due to the increasing reliance on space infrastructure. Space hazards play a crucial role in space governance because they represent global challenges that would be ideally any planetary authority, which currently does not exist. The destruction of a single satellite could lead to the destruction of thousands more due to the escalating issue of orbital debris (Kessler's syndrome), making it challenging to target one without inflicting collateral damage on everybody. Consequently, space presents numerous collective action dilemmas, as well as opportunities to address them applicable to other domains of challenges humanity faces.

Course structure

Each session consists of my presentation and your reflection on the provided reader. Active participation based on the compulsory reader is a requirement. The first session is designed to provide basic theoretical insights and will be followed by five sessions developing the perspective of space security issues along with the closing session discussing their governance.

Course requirements and evaluation

Each student is required to read the compulsory reader in each session and actively participate in the discussion. Each student should reach a certain level of familiarity with the recommended reader as well to be properly prepared for the written analysis and policy recommendation at the end of the course. It will help you to write the analysis and policy recommendation on a higher level. Additional literature beyond the syllabus will be considered as a significant benefit in the evaluation.

Distribution of points: 100 – 95 A | > 88 B | > 77 C | > 68 D | > 60 E | < 60 Failed

- **Active participation based on the literature** **1 ECTS (25p)**
  Each student submits written notes from the reader before each class and then is required to actively participate in the discussion. If you miss the presentation, you still have to submit notes from the reader. Reading is compulsory; learning is a joy!

- **Written analysis** **2 ECTS (50p)**
  Each student picks a topic and writes a short study (〜3000 words ± 15%) that includes:
  1) short description of the problem related to the topic (launching 30k satellites destroys orbital paths, avoiding asteroid impact requires knowledge and technical ingenuity and capacity to deflect it, mitigating space weather impact on orbital infrastructure can be achieved by shields or temporary shutdown of the electronic devices,
  2) a literature review of the available knowledge – using a citation manager will help you as you will gain an advantage and I will consider it as a competence, however, literature review is not a mere summary of the available literature but a specific narrative helping you summarize the topic using the available literature, it is about the context want to frame by that literature and your understanding of the problem,
  3) analysis and available answers to the problem, which are not necessarily "solutions" but could be mitigation, avoidance

- **Policy memo** (〜700 words ± 15%, one pager) **1 ECTS (25p)**
  This is a special format we use for the Minister of Foreign Affairs. You will learn how to advise a minister. The structure is as follows: introduction to the problem, analysis, and recommendation. The difference from the previous is its length and concise format. You must be able to fit previous knowledge in a 2-minute reading long one page and include particular steps the ministry should pursue.

1. Space Security: the conundrum of national security interests

In the introductory section, we will outline and define outer space, describing how its physical characteristics, like orbital mechanics, differ from those of planetary territories from a strategic viewpoint. In the theoretical section, we will examine four distinct theoretical perspectives on space security and their implications for governance at national, international, and global levels. By the end, you will grasp the essentials of space security and have an overview of what to expect throughout the course.

Compulsory reader:

- Chapter 1 – The Dynamics of Space Security: Existing Explanations In Moltz, J. C. (2011). *The Politics of Space Security*. Stanford, California: Stanford University Press.
- Pekkanen, Saadia M., and P.J. Blount. "International Relations Theory and the Evolution of 'Peaceful Purposes' in Outer Space." In *The Oxford Handbook of Space Security*, edited by Saadia M. Pekkanen and P.J. Blount, 1st ed., 3–21. Oxford University Press, 2024. https://doi.org/10.1093/oxfordhb/9780197582671.013.1.

Recommended reader:

- Both books above are perfect summary of the whole space security issue from various perspectives. While Moltz is a single author perspective, it provides diverse theoretical perspectives, distinct insights, while summarizing the topic as a whole. The Oxford Handbook is the newest summary by globally recognized experts.
- (15p)[1] USAF, Air University Space Primer, Chapter 8 – Orbital Mechanics (start with section Orbital Motion, page 8-8)

[1] Skim read to get involved into the orbital mechanics laws, you don't need to read it thoroughly, but you should know what are newton laws, what does it mean to break in space, speeds on orbit etc.

2. International legal framework governing space activities

International space law is currently guided by five main treaties. Although no new treaties or revisions are expected soon due to UN COPUOS's consensus rule, numerous non-binding instruments continue to emerge. These include topics like space sustainability, planetary defense governance, rules for dark sky protection for astronomy, principles of responsible behavior in space, and regulations by the International Telecommunication Union on radio spectrums and satellite orbits. This session aims to explain how states manage territory in space, which they use for national security but do not have sovereign power over.

Compulsory reader:

- Sophie Goguichvili, Alan Linenberger, Amber Gillette (2021). The Global Legal Landscape of Space: Who Writes the Rules on the Final Frontier? Wilson Center
- Skim the Outer Space Treaty and check the remaining four other space treaties at least on the level that gives you the general insight into what they are about
    - Rescue Agreement (1968)
    - Liability Convention (1972)
    - Registration Convention (1975)
    - Moon Agreement (1979)
- Read Section I. and skim the rest of the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee on the Peaceful Uses of Outer Space
- (30p) Kasku-Jackson, J., & Waldrop, E. (2009). Understanding space law: legal framework for space. In D. Coletta & F. T. Pilch (Eds.), *Space and defense policy* (pp. 64–103). New York: Routledge.

Recommended reader:

- UNOOSA (2014). Education Curriculum on Space Law.
- Deplano, Rossana. "THE ARTEMIS ACCORDS: EVOLUTION OR REVOLUTION IN INTERNATIONAL SPACE LAW?" *International and Comparative Law Quarterly* 70, no. (July 2021): 799–819. https://doi.org/10.1017/S0020589321000142.
- Smith, Walker A. "Using the Artemis Accords to Build Customary International Law: A Vision for a U.S.-Centric Good Governance Regime in Outer Space." *Journal of Air Law and Commerce* 86, no. 4 (2021).

3. Space as a warring domain: the military perspective on space

National security views are grounded in and restricted by national borders. How can these interests extend into space, which the Outer Space Treaty designates for peaceful purposes? We will examine the differing perspectives of various countries and discuss what constitutes a weapon in space. The distinction between the militarization and weaponization of space is central to this debate, and we will also differentiate between national interests in Earth's orbital space and territories on other planets. The session will conclude with a discussion on the Artemis Accords and the dilemmas they present.

Compulsory reader:

- Sweijs, Tim, and Davis Ellison. "The Next Frontier: Strategic Theory for the Space Domain." In *The Oxford Handbook of Space Security*, edited by Saadia M. Pekkanen and P.J. Blount, 1st ed., 155–71. Oxford University Press, 2024. https://doi.org/10.1093/oxfordhb/9780197582671.013.11.

Recommended reader:

- Dolman, E.C. *Astropolitik: Classical Geopolitics in the Space Age*. Astropolitik: Classical Geopolitics in the Space Age. Frank Cass, 2002. https://books.google.at/books?id=6QrCxwEACAAJ.
- Mendenhall, E. (2018). Treating Outer Space Like a Place: A Case for Rejecting Other Domains Analogies. *Astropolitics.*
- Zhang, Y. (2013). The eagle eyes the dragon in space – A critique. *Space Policy* 29 (2), pp. 113-120.
- Bowen, B. E. (2020). *War in Space: Strategy, Spacepower, Geopolitics*. Edinburgh: Edinburgh University Press.

4. Commercialization: infrastructure, orbital debris, and new societies' fragility on an unseen level

Space operations are evolving from government control to increasing private involvement. Initially, national governments dominated due to the sensitive nature of rocket technology. This is changing with the rise of small launchers and reduced launch costs by SpaceX. Some space activities are shifting to the commercial sector, posing risks of excessive privatization, including colonization of other planets. This shift could diminish governmental influence, impacting how we manage our societies both in space and on Earth.

Compulsory reader:

- Rosen, Jared Rosen, Nima Leclerc Leclerc, and Thomas J. Shattuck Shattuck. "Challenges and Opportunities at the Dawn of the New Space Age." Perry World House, University of Pennsylvania, March 21, 2022. https://doi.org/10.15868/socialsector.41127.
- Billings, Linda. "Should Humans Colonize Mars? No." *Theology and Science* 17, no. 3 (July 3, 2019): 341–46. https://doi.org/10.1080/14746700.2019.1632524.

Recommended reader:

- Musk, Elon. "Making Humans a Multi-Planetary Species." *New Space* 5, no. 2 (June 2017): 46–61. https://doi.org/10.1089/space.2017.29009.emu.
- Brown, Trevor. *The Digital Galactic Complex*. Springer, 2016.
- Pyle, R., and B. Aldrin. Space 2.0: *How Private Spaceflight, a Resurgent NASA, and International Partners Are Creating a New Space Age*. BenBella Books, 2019.
- Schmidt, Nikola. On the Brink of Space Colonization: What Are the Current Prospects for Humanity to Spread Across the Solar System? In Hoerber, T. Routledge Handbook of Space Policy. 2024.
- Dobos, Bohumil, and Jakub Prazak. "To Clear or to Eliminate? Active Debris Removal Systems as Antisatellite Weapons." *Space Policy* 47, no. xxxx (2019): 217–23. https://doi.org/10.1016/j.spacepol.2019.01.007.
- Schmidt, Nikola, and Petr Bohacek. "First Space Colony: What Political System Could We Expect?" *Space Policy* 56 (May 2021): 101426. https://doi.org/10.1016/j.spacepol.2021.101426.
- Paikowsky, D. (2017). What Is New Space? The Changing Ecosystem of Global Space Activity. *New Space* 5 (2), pp. 84-88.

5. Space-related hazards: asteroids, coronal mass ejections, space weather

This session will address natural space security threats. Planetary defense is well-developed in many areas, but the likelihood of a coronal mass ejection impact hasn't been considered. What drives these choices? Is it risk assessment, public interest, political authority, or available technology? This session will address the intersection of the globally significant challenge posed by events such as a 10 km asteroid impact or the destruction of our electrical infrastructure by coronal mass ejection, alongside the production of scientific knowledge, role of political and epistemic authorities, and global governance constraints to address these challenges.

Compulsory reader:

- *Skim the* Introduction In Pelton, Joseph N., and Firooz Allahdadi. Handbook of Cosmic Hazards and Planetary Defense. Springer International Publishing, pp. 3-33. 2015.
- Schmidt, Nikola. "Responsibility to Defend Earth as a Core Principle of the Planetary Defense Security Regime." *Nature Communications* 15, no. 1 (August 19, 2024): 7106. https://doi.org/10.1038/s41467-024-51517-0.

Recommended reader:

- Schmidt, Nikola, ed. Planetary Defense – Global Collaboration for Defending Earth from Asteroids and Comets. 1st ed. Space and Society. Cham: Springer International Publishing, 2019. https://doi.org/10.1007/978-3-030-01000-3.
- Schmidt, Nikola, ed. *Governance of Emerging Space Challenges: The Benefits of a Responsible Cosmopolitan State Policy*. Space and Society. Cham: Springer International Publishing, 2022. https://doi.org/10.1007/978-3-030-86555-9.
- Schmidt, Nikola. "Responsible Cosmopolitan State in Space Politics." In *Governance of Emerging Space Challenges*, edited by Nikola Schmidt, 93–113. Space and Society. Cham: Springer International Publishing, 2022. https://doi.org/10.1007/978-3-030-86555-9_6.
- Pelton, Joseph N., and Firooz Allahdadi. *Handbook of Cosmic Hazards and Planetary Defense*. Springer International Publishing, 2015.
- Oughton, Edward J, Andrew Skelton, Richard B Horne, Alan W P Thomson, and Charles T Gaunt. "Quantifying the Daily Economic Impact of Extreme Space Weather Due to Failure in Electricity Transmission Infrastructure," 2017. https://doi.org/10.1002/2016SW001491.

6. Space Governance options and visions

Space presents a distinctive realm where its physical properties do not easily align with the continuum of national security politics, although it is certainly influenced by them. The historically unprecedented achievement of the Outer Space Treaty, now criticized as obsolete in light of the new space race, burgeoning commercial space industry, and aspirations for planetary colonization, demonstrated the potential of international cooperation. However, various entities—whether democratic, authoritarian, or wealthy private individuals—are attempting to redefine space as we know it. What implications does this have for human space exploration overall, and how might these developments affect governance structures both in space and on Earth?

Compulsory reader:

- Schmidt, Nikola. "Responsible Cosmopolitan State in Space Politics." In Governance of Emerging Space Challenges, edited by Nikola Schmidt, 93–113. Space and Society. Cham: Springer International Publishing, 2022. https://doi.org/10.1007/978-3-030-86555-9_6.
- Švec, Martin, and Nikola Schmidt. "International Space Law as the Transiting Path to Cosmopolitan Order." In *Governance of Emerging Space Challenges*, edited by Nikola Schmidt, 65–91. Space and Society. Cham: Springer International Publishing, 2022. https://doi.org/10.1007/978-3-030-86555-9_5.
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Recommended reader:

- Švec, Martin, and Nikola Schmidt. "International Space Law as the Transiting Path to Cosmopolitan Order." In *Governance of Emerging Space Challenges*, edited by Nikola Schmidt, 65–91. Space and Society. Cham: Springer International Publishing, 2022. https://doi.org/10.1007/978-3-030-86555-9_5.
- Schmidt, Nikola, and Petr Boháček. "Dawn of Cosmopolitan Order? The New Norm of Responsibility to Defend Earth and the Planetary Council." In *Planetary Defense*, edited by Nikola Schmidt, 315–38. Space and Society. Cham: Springer International Publishing, 2019. https://doi.org/10.1007/978-3-030-01000-3_21.
- Cockell, Charles. *Human Governance Beyond Earth*. Edited by Charles S. Cockell. Space and Society. Cham: Springer International Publishing, 2015. https://doi.org/10.1007/978-3-319-18063-2.