P07 / Exploring the final frontier: Emerging Trends and Interdisciplinary approaches in Space Policy and Governance Research

Topic : SCIENCE AND TECHNOLOGY POLICY

Chair : Cheyenne Black (The University of Oklahoma)

Second Chair : Jonathan Ruff (South Dakota State University)

GENERAL OBJECTIVES, RESEARCH QUESTIONS AND SCIENTIFIC RELEVANCE

Space policy and governance is an expansive, multidisciplinary field encompassing diverse research agendas. Scholars explore the rapid diversification of policy actors (European Space Policy Institute, 2017; Paladini & Castellucci, 2023), technological advancements (Krelina, 2023; RAND Corporation, 2024), the expanding space economy (Aldrin, 2013; Whealan, 2019), and rising challenges like space congestion (Moltz, 2019) and space debris (Gorman, 2019; Migaud, 2020; Miller, 2021). Additionally, the field addresses critical issues of international collaboration (Jiang and Zhao, 2021) and strategic competition among powers (Ruff et al., 2022; Brose, 2020; Johnson-Freese, 2017). Researchers from public policy, international relations, public administration, sociology, and political economy now contribute to this evolving discipline (Pomeroy, 2019).

This panel convenes scholars and practitioners to address key questions at the intersection of space policy and interdisciplinary research. As space becomes an ever-diverse field with significant intersections in energy, governance (both domestic and international), and its critical role in addressing global challenges such as climate change through satellite technology, space policy research and theory building is now central to understanding these complex issues.

We seek to foster collaboration among policy scholars and practitioners, aiming to answer the following research questions:

1. *What are the common practices used among various disciplines, such as policy process, public administration, international relations, and political economy, in space policy research agendas?*

2. How are these common practices for topical, methodological, and theoretical research agendas influencing the direction of space policy studies?

The relevance of space policy has never been greater - yet, space policy research remains isolated within academic disciplines. This panel intends to bridge the gap between disciplines by encouraging interdisciplinary conversations that explore the growing relevance of space policy and governance in both national and international agendas.

Potential hypotheses/topics:

- The evolution of the space policy subsystem, driven by the emergence of new coalitions, actors, and market incentives that shape policy preferences. Purpose: re-examining coalition typologies and their impact on the policy landscape using the Advocacy Coalition Framework (Jenkins-Smith and Sabatier, 1994).

- The construction of narratives within space policy influences public and political discourse about space as a frontier for technological innovation, security concerns, and environmental monitoring. Purpose: developing deeper understandings of the trends in narrative discourse surrounding space policy and governance using the Narrative Policy Framework (Shanahan, Jones, and McBeth, 2015).

- Partisan rationales shape the priorities of domestic space programs, with a focus on economic development, national security, and the framing of space exploration as a symbol of political and technological prowess. Purpose: discussing the partisan and moral rationales which shape priorities of domestic and international space programs.

- Political agendas in domestic and international space governance have shifted over time. Domestically, space policy may be driven by economic growth and defense strategies, while internationally, there is increasing focus on collaboration and peaceful governance to ensure the sustainable use of space as a global commons. Purpose: describing the advancement of space policy in domestic and international governance agenda-setting.

These topics underscore the growing importance of space policy as an interdisciplinary area of research. By examining these dynamics, the panel will shed light on space as a crucial arena for national and global policy, offering insights into the adaptation of policy to the evolving realities of space exploration, utilization, and regulation.

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CALL FOR PAPERS

As space becomes an increasingly critical domain, intersecting with areas such as defense, environmental studies, international relations, technological innovation, and the burgeoning space economy, space policy research has never been more relevant. This panel seeks to

foster collaboration and answer key questions on the methodological, topical, and theoretical approaches driving the future of space policy research. The panel will explore how space policy has emerged as a critical area of study and discuss its impacts on national interests, international cooperation, and global governance. We welcome papers that address these and other relevant issues, bringing new insights into the evolving landscape of space policy.

We encourage contributions from a variety of perspectives and disciplines. Topics of interest include but are not limited to:

? Policy subsystems and actor coalitions in space policy
? Space technology and innovation as drivers of policy change
? International and domestic space governance
? Defense, economic development, and the space economy
? Narratives and discourse in space policy
? Environmental policy and space-based climate monitoring

We invite submissions from scholars, practitioners, and researchers across various disciplines who are exploring space policy's implications in areas such as:

? The evolution of coalitions and the space policy subsystem, with attention to new policy actors, preferences, and market incentives.
? The role of narratives in shaping public and political discourse around space, including issues of technology, security, and environmental monitoring.
? The influence of partisan rationales in domestic space programs, particularly regarding economic development and national defense.
? The development of political agendas in space governance, both domestic and international, focusing on economic growth, peaceful collaboration, and the governance of global space commons.

Please submit a paper title and abstract (200-300 words) by the 31st of January, 2025 to the ICPP7 conference site. We look forward to receiving your submissions and engaging in lively discussions about the future of space policy research.

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Session 1

Friday, July 4th 16:00 to 18:00 (C3)

Competition on Mega-constellation in LEO, Relations between Commercial Actors and Service Taking States: Need of Articulating a New International Space Policies & Governance, A perspective from Global South

Most Sharmin (South Asian University)

The state and private actors are competing to increase the number of satellite mega-constellations, which will have an overarching impact on Space policy and governance areas. LEO-based broadband facilitates internet access to remote or underserved areas of the globe, significantly shaping the terrestrial economy and enabling developing and least developing countries to achieve sustainable development goals. However, the array of space technological development or opportunities to access space resources like orbits or even the capacity to utilize space-based technologies is not equal, where the global south states are still dependent on big space actors. No internationally agreed norms or policy exist which clearly mentions how small states will secure their data sovereignty while buying space-based data & services from commercial Space actors. Because, in many cases, private actors or service providers states can deny providing data or services in critical geopolitical events. But Satellite data and services are prime for economic activities & national security issues. Therefore, an international Space policy doctrine is needed to clarify the relations between Commercial actors and small states. Already, LEO has been occupied by a few private and state entities. There are no explicit norms or provisions exist to prevent states or private parties from increasing the number of mega-constellations, and a first-come-first-served practice in LEO will leave aspiring states out. With this, the service provider actors (State or private) will influence user countries, and this dependency can lead to compromised sovereignty for many small states. So, new Space policies on mega-constellation and orbital governance are urgent for humankind.

Besides this, the orbital environment and sustainable use of Space are compromised. Unfortunately, crowding and contested LEO increased the threats of orbital debris, and as it is near-earth orbits, any intensifying condition between space actors could directly affect the earth's environment and Anthropocene. Commercialization brings opportunities for many non-space-faring states; at the same time, the absence of clear and legally binding international norms on debris removal will create deteriorated orbit or orbital pollution-like challenges.

The study intends to explore the credibility of existing international space governance, treaties, and laws for shaping International Space Policies in addressing broad-ranging issues like the non-space faring actors and commercial actors relations, the question of aspiring state's rights to access and utilize LEO for socio-economic development, mega constellation, debris removal, and sustainable use orbits, and lastly how existing competition on mega-constellation by various entities will influence Space governance and future policies. The study applies explanatory research approaches to critique the existing international and regional space policies to understand the depth of the problem.

In Defense of the Politics-Administration Dichotomy: An analysis of political and administrative Space Force narratives

Jonathan Ruff (South Dakota State University)

Storytelling is a central transmitter of policy problems. In the fields of Public Policy and Public Administration, policy narratives have grown in interest as a scientific tool to identify how information is conveyed to the public through the political framing of values, beliefs, and contexts. Policy narratives are

also increasingly recognized by global governance structures as key strategic and diplomatic tools in national defense. This article explores the relationships between political and administrative policy narratives surrounding establishment of the US Space Force. After a failed House bid to create a ‘Space Corps’ in 2017, President Trump’s announcement of a Space Force took many in the warfighting bureaucracy by surprise. Two years of congressional testimony from legislators and experts in the space bureaucracy revealed an abundance of policy stories about the purpose, structure, trajectory, and justifications (or lack thereof) for the US Space Force. Reviewing the similarities and differences between political and administrative policy storytelling, this article leverages the Narrative Policy Framework (NPF) in the context of Wilson’s Politics-Administrative Dichotomy to test the relevance of the theory in modern sub-governmental structures. After establishing a core resonance between public policy and public administration literatures in storytelling blame, the article conducts a content analysis exploring the use of policy stories and the narrated administration of blame as an element of narrative plot. The results highlight significant differences between policymaker and administrator storytelling in space-defense narratives, including contrasting viewpoints on the relevant characters in space-defense, optimal policy choices, and past interpretations and future expectations for policy outcomes. The article concludes with a discussion on the implications of narrative competition between politicians and administrators and derives new methodological approaches to capture causal attribution as an element of plot within policy narrative studies.

From Apollo to Artemis: Transformations in the U.S. Space Policy Subsystem and Coalition Dynamics

Cheyenne Black (The University of Oklahoma)

The space policy sector is undergoing significant transformation, with priorities focusing on Moon to Mars endeavors, deep space exploration, and low Earth orbit activities. The space policy subsystem has evolved from a public technical subsystem to a private-public partnership policy subsystem. This cross-national subsystem now comprises many stakeholders, or policy actors, from both public and private organizations, all seeking to influence policy decision-making in space. These developments coincide with trends such as commercialization, international collaboration, militarization, and economic development and are influencing shifts in coalition dynamics within the cross-national space policy subsystem. This dissertation investigates how these changes impact the number and type of actors involved in space policy discussions, the discourse networks within these discussions, and the evolution of the international space policy agenda. To analyze these changes, U.S. Congressional hearings, bills, Presidential Executive Orders (EOs), international space agreements, and space treaties from 1958 to 2023 are examined. First, witnesses invited to congressional hearings to participate in space policy discussions are inspected for affiliation diversification outside of traditional government roles following policy, societal, privatization, and international collaboration changes. Second, discourse network analysis (DNA) is employed to map changes in actor congruence networks, coalitions, the modularity of space policy discussions, and the policy concepts in congressional hearings. Finally, topic modeling is applied to international space agreements, EOs, and space treaties to understand the evolution of the international U.S. space policy agenda over time.

Leveraging Natural Language Processing to Analyze Narrative Structure in U.S. Space Policy

Cheyenne Black (The University of Oklahoma)

Jonathan Ruff (South Dakota State University)

Gregory Stelmach (Oregon State University)

Natural language processors (NLPs) have grown in interest in public policy analysis as tools to improve the efficiency of qualitative research practices. This paper examines the utility of NLPs in the context of US space policy Congressional documents detailing commercialization. As a low-salience arena, space policy offers a unique opportunity to test NLPs within complex and technical distinctions in language. Past attempts at adopting NLPs in policy process research have demonstrated difficulties with complex policy designs. This paper adopts a theoretical construction to aid the machine learning process through established categorization by identifying narrative elements in policy storytelling. Policy narratives, stories that define problems, solutions, and actors, play a critical role in framing policy debates. Using the Narrative Policy Framework (NPF), a policy process framework distinguishing the core elements of policy narratives, this article adopts NLPs to test the resiliency of machine learning and improve the capacity of the NPF to capture a troublesome narrative element, and central construct of policy narratives: Plot. By adopting machine learning techniques, the paper develops a framework to automate the qualitative coding of narrative plots across large collections of U.S. space policy texts. The analysis explores three dimensions of

the narrative plot: (1) sequential structure, which examines the order and progression of the narrative; (2) valence, which assesses the positive or negative tone attributed to policy actors and outcomes; and (3) causal attribution, which identifies how responsibility for outcomes is assigned by the narrator. By applying natural language processing (NLP) algorithms, the study uncovers recurring patterns and themes across US space policy narratives, highlighting how policy actors construct and communicate visions of the future of space exploration, governance, and international collaboration. The findings demonstrate that machine learning approaches offer a scalable and efficient method for analyzing complex topics and narrative structures, providing valuable insights for researchers, policymakers, and institutions seeking to understand the framing of space policy.