MAHHAD NAYYER &
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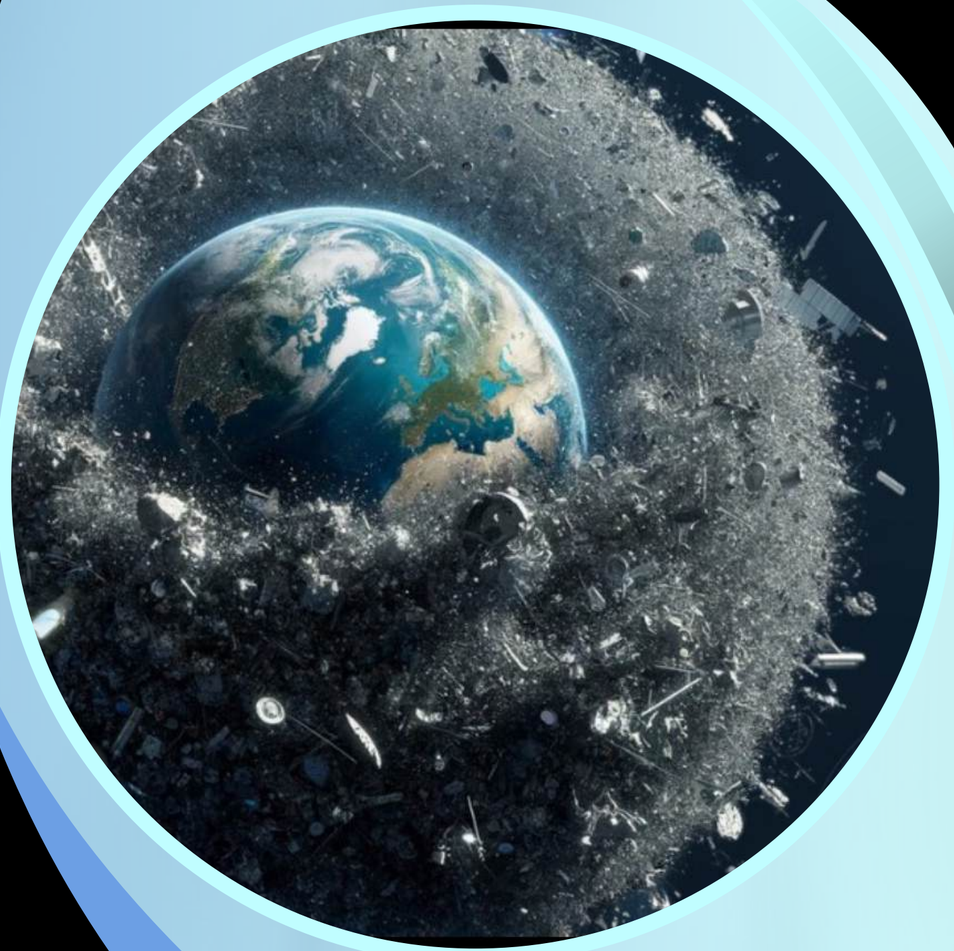
PATHWAYS TO ZERO DEBRIS

Legal Transformation, Economic Incentives and the Role of Young Space Professionals



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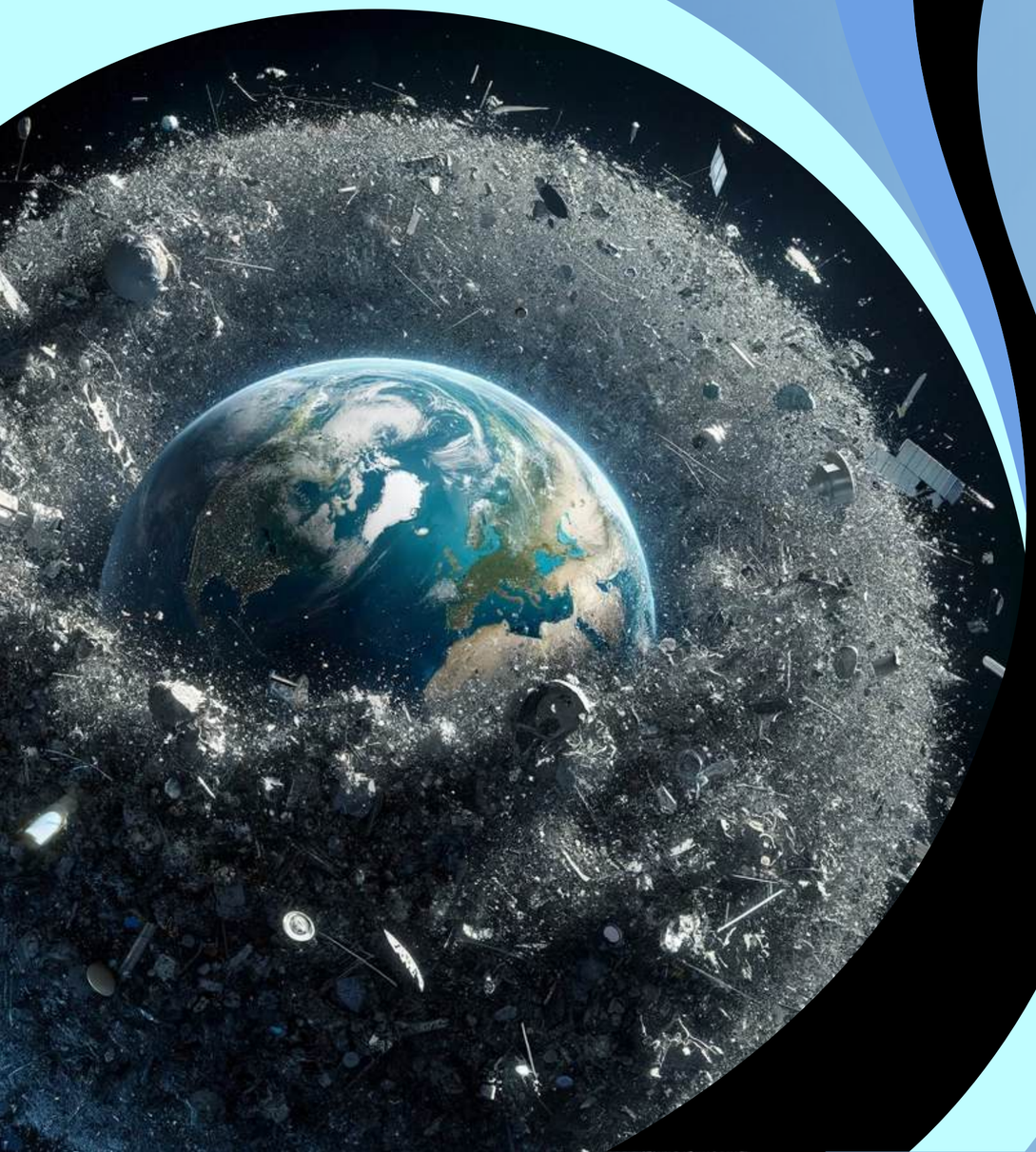

Agenda

1. Zero Debris Charter & Gaps
2. Legal Transformation
3. Economic Incentives
4. Inclusion of Young Space Professionals
5. Conclusion

Zero Debris Charter

- Created and written by 40 space actors
- 179 companies committed to sign
- 88 signatures today
- Contains both high-level guiding principles
- Specific, jointly defined targets to get to Zero Debris by 2030.

Gaps:

- Implementation
- Regulation
- Incentives
- Inclusion (civil society, young space professionals, etc).

How do we get there?

1. Legal Transformation
2. Economic Incentives
3. Young Space Professionals

Legal Transformation

- Methodology to shape legal guardrails towards envisioned future scenarios.
- Combines Strategic Foresight with Comparative Law
- Brings together futurists and diverse experts to include all relevant perspectives

> "Law is a *tool* for shaping desired futures. It is *flexible* and changes over time in line with evolving social *values*."

Economic Incentives

Non-binding agreements like the Zero Debris Charter as well as international treaties like the Outer Space Treaty lack legal enforceability. Economic incentives can be alternative means of implementation:

- **Taxation & Subsidies**
- **Talent Aquisition**
- **Certifications & Benefits**

The Role of Young Space Professionals

- Biggest challenges are not technical but political and bureaucratic
- Co-operation to be initiated across geopolitical lines
- Multiple levels of decision-making and shared autonomy to be established by young professionals carrying out research in astrodynamics and conjunction probabilities
- Facilitating local and regional chapters of young professionals to ensure a constant stream of qualified experts.

The Role of Young Space Professionals

Young professionals are poised to be the **driving force** behind the vision of zero debris and a sustainable space economy. With their innovative mindsets, technical expertise, and fresh perspectives, they are uniquely positioned to **challenge the status quo** and bring forward new solutions to the complex problem of space debris. By actively engaging in policy advocacy, technological innovation, and collaborative efforts, they can help shape frameworks that promote a circular space economy, where resources are reused and debris is minimized. Moreover, young professionals can leverage their **adaptability and awareness** of global sustainability challenges to integrate space sustainability with broader environmental and economic goals. As future leaders, their **commitment to accountability, ethical decision-making, and cross-sector collaboration** is essential to driving the systemic changes needed for long-term space sustainability. Their involvement is not only crucial for the success of initiatives like the Zero Debris Charter but also for ensuring that space remains a viable and thriving domain for generations to come, benefiting both space exploration and life on Earth.

Conclusion

- **Leverage the Zero Debris Charter:**
  - Encourage more space actors to sign the charter and commit to its principles.
  - Push for stronger regulatory frameworks to fill gaps in implementation and enforcement.
- **Apply Legal Transformation:**
  - Advocate for strategic foresight and comparative law to develop legal structures that support space sustainability.
  - Engage with policymakers to ensure legal frameworks align with the zero-debris vision.
- **Promote Economic Incentives:**
  - Design and propose tax breaks, subsidies, and certification programs to reward responsible space behavior.
  - Integrate sustainability criteria into public contracts to drive compliance with zero-debris goals.
- **Empower Young Space Professionals:**
  - Foster networks of young professionals to lead innovation and collaboration in space sustainability.
  - Facilitate their involvement in cross-border projects and research on debris management and astrodynamics.
- **Advance a Circular Space Economy:**
  - Push for sustainable design and modularity in spacecraft to enhance longevity and reduce waste.
  - Support development of ISAM capabilities and prioritize research in end-of-life management and recycling technologies.
  - Advocate for enforceable regulations that promote responsible stewardship of space resources.

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