Interview – Samuel Jardine

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Samuel Jardine is a geopolitical consultant specialising in strategic competition and governance, focusing on Space, the Arctic, the Antarctic, and the seabed. He has advised government, UN agency, corporate, and NGO clients globally on major emerging policy areas. He has been invited to lecture at institutions including the Royal College of Defence Studies, Royal Navy Strategic Studies Centre, and RUSI alongside appearing in global media. He is currently the Head of Research at London Politica (a geopolitical risk consultancy and think tank), a Senior Advisor at Luminint (a risk intelligence advisory) and a Research Associate for Oxford University and CHACR's Climate Change & (In)Security Project. He is also the Policy Specialist for the Lunar Policy Platform, a Fellow and Lunar Registry Project Lead for the Open Lunar Foundation, and a Research Affiliate for the Center for Space Governance.

Alongside this, Sam has a freelance consultant practice aligned with the International Peace and Security Network, and is a Consultant for RUSI's Defence, Industries and Societies programme as well as Mabway. Formally, Sam was the Project Manager for Lord Kerslake's Independent cross-bench Commission in UK Military Accommodation and was a Consultant for RUSI's Defence, Industries and Society Program. He has held Research Fellowships with the Foresight Institute, Open Lunar Foundation, Center for Space Governance, the Arctic Institute, Ecologic Institute and MiH-RCN Arctic Geopolitics programme. Sam holds an MA in Modern History from King's College London, a BA(Hons) in History from the Open University and was a RUSI Military Sciences "Rising Stars" mentee.

Where do you see the most exciting research/debates happening in your field?

Given that my field, frontier geopolitics, covering Space, Arctic, Antarctic, and Seabed, are all very new in terms of having increasing geopolitical competition impacting their status quo and indeed, in many cases actually being responsible for facilitating them! It is here that the exciting, terrifying, and sometimes existential debates are taking place. The current global landscape has meant that there are now fewer certainties than ever before, making forecasting and risk analysis more important than ever and helping to drive a resurgence in Applied History- one of my favoured methodologies.

We are in a period of intense political polarisation. Multilateralism and international law are going through a recession in favour of sovereign interest and escalating competition, globalisation is not backsliding, but shifting into "***blocification***" due to geopolitical, security and domestic political concerns. Populist politics globally appears to be taking hold as a backlash against the negative aspects of a global world economy. Despite this, the world is more connected than ever, courtesy of social media and the internet. However, for how long that lasts long term, there is an ongoing debate about the potential regionalisation of the web. It is a time of rapid change where policy tools thought in the West as "outdated" such as peer/near-peer warfare are seemingly back on the menu as ways of pursuing foreign policy objectives.

In between all of this, we still, however, need to come together to solve increasingly pressing transboundary and global issues- most existential of all being mitigating, or potentially adapting, to the consequences of climate change. In all these contexts, the polar regions, space, and seabed feature prominently as the areas that may both ensure humanity's future but also are the new emerging arenas in which multipolar geopolitical competition is playing out.

How has the way you understand the world changed over time, and what (or who) prompted the most

significant shifts in your thinking?

I have had the (mis?)fortune to grow upright on the cusp of this sea change. So, I think my understanding of the world has shifted from a fairly straight-forward late-90s/early 2000s perspective that globalisation and international institutions are concepts that are built on bedrock, to understanding their fragility in the face of emerging powers who feel they do not fairly suit them. It has made me appreciate both the benefits and advantages of current governance systems, but also the negatives they have or can cause for segments of humanity. I also have been surprised by, but now understand that existential risk is not actually a significant unifier for humanity. Whether it be dealing with climate change, nuclear competition, or a Kessler Syndrome event cutting off our access to orbits- that alone is usually not enough for actors to cooperate and put aside their competitive aims, at least not until the issue is staring them right in the face and its likely too late to do any significant mitigation by then.

This has not been a depressing lesson though, more a realisation that we all need to do better at incentivising differing actors and understanding their motivations. Now I explore how we can make better, more mutually beneficial multilateral governance arrangements in key existential areas or geopolitical arenas – how we can keep multipolar geopolitical competition productive and restrain its excesses, adapt to a multipolar world, and what actually drives actors in their policy aims. In doing this, it is important to "get out of my bubble" and actually talk with and learn from these actors and stakeholders with no judgment. It is about understanding that country *Y* in West Africa does not want to be told they need to ensure their future planned space operations are sustainable from an environmental perspective, but instead, be pitched that it is a sensible economic decision that improves long-term efficiency. It is about not getting bogged down in what might be called performative political polarisation and ensuring actionable progress happens on the key issues that build relationships, cooperation, and understanding between all parties.

With the growing influence of Russia, China, and the BRICS countries in the Arctic, how do you think the Arctic Council can adapt to these shifting geopolitical dynamics? What role do you see it playing in managing security and diplomatic challenges in the region?

Broadly, the Arctic Council's ability to manage geopolitical and security challenges is inherently limited, leaving it ill-equipped to navigate a 21st-century Arctic that has become one of the key emerging arenas of geopolitical competition. While it will likely retain influence in niche but critical areas such as environmental governance, economic development, and scientific cooperation, at least for half the region, it is increasingly being sidelined in broader Arctic affairs because it does not have the mandate or capacity to tackle the interwoven security elements that have been developing in the region since 2008. If the global shift toward sovereignty-first governance over multilateralism continues, the Council's role in shaping Arctic diplomacy will only further diminish.

Three key reasons are driving this for the Arctic. **Firstly**, global interest in the region from influential non-Arctic states will strain the Arctic Council as a forum and convener. With only half the Arctic in its remit, it can be more easily sidelined, especially as non-Arctic states seek to have a great say in Arctic affairs, highlighting their interests being based on the Arctic's key role in climate change, and the impacts it has on their environmental systems. **Secondly**, the Arctic Council was already unable to adapt to a geopolitical environment that saw security concerns, that its mandate restricted it from covering, increasingly becoming key aspects in a multipolar world, to the issues it did cover, such as science diplomacy, economic development, and sustainability. **Lastly**, the concept of "One Arctic", which was the core of the Arctic Council, is gone with geopolitical competition effectively splitting the region into two competing spheres: one dominated by NATO-aligned states and the other by Russia. Many of the key Arctic issues, such as climate change, environmental protection, and economic development, were transboundary. Without half of the Arctic in its remit, the effectiveness of its efforts and its influence is significantly diminished.

It is perhaps important to note here (as a caveat), that even if a Trump administration promotes the reintegration of Russia into the G7 and this translates down the line to Russia re-joining the Arctic Council a lot of the above geopolitical issues, particularly the split of the Arctic into two with diverging security, regulatory and geopolitical approaches will remain, as will the Arctic Council's inability to deal with a geopolitically competitive landscape that sees security and geopolitical issues tied to, and inform its mandated interests- it would still be trying to operate with one arm tied behind its back.

This is not to say that the Arctic Council will be entirely sidelined, as it may remain a key forum for NATO-aligned Arctic states, maintaining relevance over just under 50% of the region. Its work in environmental protection, scientific diplomacy, and indigenous representation could also allow for limited engagement with Russian counterparts in the future, particularly on specific transboundary issues. However, even this role comes with risks. Trump 2.0 has already strained NATO Arctic cohesion through aggressive security posturing and controversial Greenland-related policies including a bill by Republican lawmakers to facilitate negotiations for Greenland to join the US, even proposing to rename it in official US designations as "Red, White, and Blue-land", a move that has caused diplomatic tensions with both Greenland and Denmark.

However, since the Arctic Council lacks a mandate to address political or security disputes, its ability to de-escalate tensions would be severely limited. If a future US administration chooses to escalate Arctic sovereignty disputes, such as the longstanding US-Canada disagreement over the Northwest Passage, the Council would remain a bystander rather than a mediator, further highlighting its diminishing role in Arctic governance.

Given the rise in Arctic shipping traffic and Russia's shift away from Arctic Council cooperation in favour of partnerships with non-Arctic states, what security risks and diplomatic implications should states consider in preparing for future challenges, especially in contested areas like the Northern Sea Route (NSR)?

There are **two key interwoven factors** here. **First**, misunderstanding and misconstruing states' intentions is the biggest security risk. The Arctic is evolving into a classic security dilemma due to the lack of multilateral dialogue and the increasing interest of non-Arctic actors. The only real messaging that now happens in the region between competing actors is military due to the absence of dialogue. **Second**, the biggest diplomatic implication linked to this is strategic in nature. This being that states need to start **thinking vertically** – i.e., for all states, the Greenland-Icelandic-UK gap (GIUK Gap) becomes important once more. China as a naval power is very different to the former USSR- it is seeking to build a comprehensive blue water navy that can operate globally, rather than focusing on a largely asymmetrical maritime doctrine of regional defence and disruption. China's significant investment in Russia's claimed NSR can, through a certain lens, be seen as an enabler of this alongside its economic and political goals for Beijing. China does not want to be cut out of any Arctic highway, or have its access blocked by NATO states, so the GIUK Gap revitalises its NATO Cold War role as a preventative chain to survey and potentially block competitors entering the North Atlantic area.

States need to become comfortable with an Arctic that is reconceptualised as an accessible maritime bridge, rather than its historic formulation as a barrier for power projection and access. These issues come together in the situation surrounding the NSR, which is currently one of the Arctic's most likely crisis flashpoints.

However, Moscow's perception of the NSR has changed dramatically away from an international-facing Suez competitor (controlled by Russia) seeking to court global shipping companies and towards a national protectionist highway with an emphasis that increasingly only key Russian partners will be able to utilise the route. The global geopolitical situation, not least of all the war in Ukraine, has impacted this shift.

Moscow bases its control over the NSR by leveraging its interpretation of UNCLOS Article 234, which permits states to regulate maritime traffic in ice-covered waters to prevent pollution. Russia expands this interpretation to justify de facto sovereignty over large sections of the route, imposing national laws that restrict foreign access and reinforce its authority with exceptions granted at Moscow's discretion to key partners. This system effectively turns access to the NSR into a powerful instrument of Russian soft power. **The impact of this shift is evident in 2024 shipping statistics,** where for the first time, NSR traffic was exclusively Russian and Chinese, whereas previous years saw at least some international presence. Complimenting Russia's diplomatic and legislative drive to control the NSR is Russia's significant rebuilding of bases and militarisation of the NSR and its Arctic coastline.

This, alongside the upgrading of its Northern Fleet, provides Moscow with a "bastion" strategy that is both defensive and offensive in its strategic value and potential operation. Moscow is acutely aware that its Arctic investments and NSR are vital to its strategic future and that a melting Arctic represents an increasingly accessible, lengthy, and

vulnerable coastline where previously it had been a barrier. Linked to this, Russia's modernised and expanded Northern Fleet is not only Russia's Arctic maritime force but also a cornerstone of its nuclear deterrence. NATO messaging and operations around this area will then poke at several highly sensitive areas for Moscow. The bastion strategy, however, also allows Russia to operate in support of other Russian security theatres through the application of pressure.

From NATO's perspective, all of this plays into recognised security risks of the Arctic becoming a bridge for power projection and disruption into the North Atlantic and North Sea. This is exacerbated by Russia's High North submarine incursions to levels comparative to the Cold War. US Vice Admiral James Fogo III stated that there is currently a "fourth battle of the Atlantic" underway stemming from this activity. In its own emerging response to its now vulnerable Atlantic, NATO has started to ramp up its Arctic presence and messaging, aiming to deter Moscow and more broadly Beijing from military inroads in the Arctic or using the NSR and their positions in the future to project power into NATO's logistically vital North Atlantic area.

Non-Arctic states further complicate matters by maintaining ambiguity on the NSR. While China has deepened cooperation with Russia, it has not taken a clear stance on the NSR. Similarly, India and other nations interested in the Arctic have shown willingness to invest in Russian projects but have not formally backed Moscow's NSR claim. Future actions by Russia or NATO over the route will likely push these states to take a position, turning the issue into a broader diplomatic flashpoint. This is before even considering the long-term implications of a trans-polar route, which, due to Russia's extensive seabed claims, could grant it leverage over surface traffic and trigger a similar cycle of tensions and strategic contestation in the future.

How might the political dynamics between Arctic and non-Arctic states, along with differing regulatory frameworks from sovereign Arctic states and the International Seabed Authority (ISA), shape the future of deep-sea mining in the region? What challenges could multinational companies face in navigating these complexities?

Broadly, deep-sea mining in the Arctic has the potential to strain diplomatic relations for Arctic states between one another and with non-Arctic states driven by **two key factors**. **First**, it heightens the geopolitical significance of overlapping seabed claims, particularly between Greenland, Canada, and Russia's central Arctic claims, as states have increased incentive to seek to secure and expand access to seabed minerals. With demand for these resources set to rise due to factors including the green revolution and expanding populations, and supply chains increasingly politicised in a multipolar world, deep-sea mining is becoming perceived by some key actors as a strategic priority. **Second**, it creates growing divisions over climate policy. Deep-sea mining's climate credentials are contested, and it sits at the intersection of many actors' environmental and economic interests. Given the Arctic's ecological fragility and the transboundary nature of environmental risk, states and companies engaged in such activities face international scrutiny and dispute.

The Arctic, with an average depth of 1204 meters, is better positioned to become a key area for deep-sea mining compared to the 4000-meter average depth of the Pacific Ocean, where the current global hub of deep-sea mining activity, the Clarion-Clipperton Zone, resides. The Arctic's shallower seabed is a significant potential advantage to deep-sea mining operations and their financial risk mitigation, especially in the context of building resilience to any lowering of costs for land-based mining through efficiencies. Complimenting this, the Arctic seabed has a significant number of hydrothermal vents where concentrations of minerals such as copper, gold, and zinc are usually found in significant quantities. The potential to harvest multiple ore types as well as rare earth elements from a single site further aids the risk mitigation for deep-sea mining operations.

For multinational deep-sea mining companies, the Arctic's seabed being almost entirely owned or claimed by various Arctic states presents a potentially expedient and commercially viable alternative to the ISA's own slow and bureaucratic regulatory regime. Arctic states will be able to set their own regulatory regimes that could compete with one another and the ISA. However, the aforementioned diplomatic controversies make the political risk of engaging in Arctic mining far higher than through the ISA.

The ISA faces an inherent contradiction in its mandate. **On the one hand**, it is tasked with developing and enabling deep-sea mining to generate profits and distribute them equitably among all stakeholders, particularly the least developed and landlocked states, as per its interpretation of Article 82 of UNCLOS. **On the other hand**, it is charged with protecting the seabed environment from harmful activity. This paradox has led to uncertainty, delays, and the perception that the ISA has been slow to act – despite being established in 1994, it only formally began developing mining regulations in 2021. These challenges are compounded by the politics of the ISA. Any framework for deep-sea mining requires consensus among all 36 voting members, each of whom has distinct national interests. The ISA's leadership has also faced controversy over perceived biases, a challenge exacerbated by its dual role as both facilitator and regulator, an inherently difficult balance.

By comparison, the Arctic presents a potentially more dynamic and stable regulatory environment for deep-sea mining. Nearly all its seabed is administered or claimed by sovereign states, with pending UN Commission on the Limits of the Continental Shelf (CLCS) submissions determining the remaining disputed areas. This means that nearly all future deep-sea mining sites will fall under national jurisdiction, rather than being governed by a slow-moving international body. This allows Arctic states such as Norway, Russia, and Greenland to craft regulatory frameworks more efficiently and without needing international consensus and can set favourable conditions and incentives for deep-sea mining, competing both with each other and with the ISA's regulatory approach. For the industry, this presents an opportunity to seek preferential treatment, and, if deep-sea mining proves viable in the long run, companies could leverage economic competition between Arctic states to secure the most advantageous tax and policy regimes. However, given the industry's history, this remains a significant "if", as deep-sea mining has yet to demonstrate long-term commercial viability following its collapse in the 1980s.

What are some apparent risks for deep-sea mining operations to consider in the Arctic?

While in comparison to the ISA, Arctic deep-sea mining does not have to account for the political and policy positions of many states globally, Arctic geopolitics and emerging dynamics between Arctic states and also "near-Arctic" states amid competition means the need to track the region's geopolitics, albeit monitoring a smaller number of actors who exert influence over one another, rather than decision-making powers.

Deep-sea mining itself is emerging within Arctic geopolitics as a significant disruptor and diplomatic flashpoint. It has the potential to exacerbate existing territorial disputes, particularly those currently being reviewed by the CLCS. While seabed claims in the Arctic have been for now been relatively low-risk due to all sides agreeing to CLCS arbitration, the economic value of deep-sea mining may change strategic calculations for Arctic states, especially as Russia has clearly signposted its adherence to international forums is seconded to its national interests. The Arctic's militarisation and ongoing competition between Russia and NATO could see states utilise military display to push or secure claims if the economic value of deep-sea mining is proven. The historical precedent set by Antarctic territorial disputes in the later 1940s and 1950s, when resource speculation was a significant driver of diplomatic tensions and military activity in the Antarctic Ocean, serves as a reminder of how resource extraction in geopolitically contested areas can become a flashpoint for broader international conflict.

Additionally, the ability of mining activities to cause transboundary environmental harm, particularly through sediment plumes and ecosystem disruptions, could further inflame disputes, as countries seek to protect their waters and economic zones from external environmental damage, especially while the risks and actual impact of seabed mining remains unknown. **A further risk** is that Russia could use any seabed mining operations in its claimed central Arctic as a mechanism for asserting control over a potential transpolar shipping route through utilising possible restrictions like "safety zones" to impact surface traffic. Russia has already demonstrated a willingness to interpret international law in ways that facilitate greater control over Arctic passageways, as seen in its regulation of the NSR. If Russian seabed mining activities in the central Arctic are leveraged to extend similar regulatory influence over transpolar routes, it could become a new diplomatic flashpoint, particularly with the US, Canada, and European nations advocating for free navigation.

The risks are further compounded by strategic competition between major powers. Increased mining activity could prompt heightened military presence in the region, particularly as Russia continues to expand its Arctic

military capabilities and sees Arctic resources as vital to its future. Furthermore, there is also growing opposition to deep-sea mining, highlighting its ecological risks.

While deep-sea mining in the Arctic offers efficiency, timeliness, and stability, it risks escalating geopolitical tensions, even among partners. Organisations need to ensure they track these developments so that things like a licensing suspension, or future increased militarisation between NATO and the Russian Arctic over potential mining sites, do not catch them, or policymakers, off guard and alter the viability of projects.

As Sino-Russian space collaboration grows and new space players like India, Japan, and the EU alongside private corporations make their mark, how do you see these developments impacting the global space race?

In a recent space stakeholder survey that I conducted of over 155 government, commercial, scientific, and related actors under Chatham House rules, a key analytical takeaway I can share is that as launch costs continue to decline, space access will become increasingly democratised, allowing a broader range of participants to enter the field. The good news is this shift enhances the likelihood of establishing sustainable space-based ecosystems and a genuine "new space economy"- one less dependent on government funding. Despite prevailing narratives that emphasise commercial progress, the reality is that government support currently still plays a crucial role in shaping and creating markets and driving demand. New Space has not really arrived yet. The bad news though is that as more actors join the space race, they enter a landscape with an outdated treaty system, lacking a globally unified framework of rules or even agreed-upon behavioural norms.

This absence of regulation and shared playbook combined with more, newer, and different actors raises the risk of accidents, disputes, and unchecked competition. The challenge is further compounded by a broader geopolitical climate in which international law is increasingly sidelined in favour of sovereign interests. Notably, no new legally binding multilateral space treaties have been established since the late 1970s, leaving critical gaps in governance at a time of rapid expansion in space activity. Incidentally, the risk is not that the Outer Space Treaty (OST) will be overturned, but that it will be in danger of becoming ignored and superseded by different groups' own minilateral frameworks. A lot can be said on these issues, but I will broadly address **four of the most pressing areas that the increase in space actors is impacting.**

First, space governance is increasingly at risk of "blocification", in which groups create their own regulatory measures in minilateral or closed groups without the consensus of the entire international community. The lack of coordination between blocs of states like the Artemis Accords or Russia-China's International Lunar Research Station (ILRS) raises the risk of regulatory conflicts, particularly over resource extraction, access rights, and operational safety. While one might assume that Artemis and ILRS would develop compatible regulatory regimes, there have been no substantive efforts to ensure interoperability.

Second, with over 100 lunar missions planned by 2030, operational complexity is rising, and the need for information sharing and coordination increases- the Lunar South Pole has already sparked US-China tensions. Moreover, the absence of information sharing has led to near-miss incidents in lunar orbit, let alone on Earth's. Looking ahead, the risk of operational accidents from the lack of shared norms is growing, and while such an event could serve as a wake-up call for governance reform, it could also just as easily become a geopolitical flashpoint that exacerbates tensions. The lowering of launch costs introduces unprecedented challenges in tracking ownership, registering activities and locations alongside, for those in orbit, establishing communication channels at scale for all operators at the time to facilitate collision avoidance.

Third, besides outer space and the lunar situation, Earth's orbit also faces pressing governance challenges due to the rise of new actors. As of 2024, there are over 10,000 satellites in orbit, up from just over 3,000 in 2020. This rapid growth has raised risks, particularly concerning space debris and a Kessler Syndrome scenario that may restrict our access to orbits. To avoid this, satellite operators frequently manoeuvre their satellites, but the lack of information and coordination available is causing insurers to reconsider coverage. One expert at the 2024 UN Conference on Space Law and Policy warned that on the current track, Low Earth Orbit will be uninsurable within two years as major

insurers pull out due to the escalating risk.

Finally, the US, China and other states are leveraging space as a strategic domain, mirroring terrestrial geopolitical competition with mistrust stalling needed diplomatic and norms-building efforts. New actors have meant increased geopolitical spillover for space, in line with other "frontier" areas like the polar regions and seabed.The Moon, particularly, is serving as a new arena for competition before even the first human footprint on its surface in the 21st Century has been made.

How can international protocols and peacekeeping efforts prevent a space conflict from escalating into a broader terrestrial conflict?

Preventing a space conflict from escalating into a broader terrestrial conflict requires strengthening international protocols, addressing gaps in existing treaties, and fostering trust among major spacefaring nations. The 1967 Outer Space Treaty (OST) remains the foundation of space governance largely due to the inability of states to sign a legally binding multilateral treaty since the late 1970s. However, while the OST makes some (not even remotely all) military activity in space illegal in principle, its enforcement mechanisms are weak, and there is growing evidence that major spacefaring nations are circumventing its spirit if not its letter. Indeed, the looming risk is not that the OST is scrapped, but that it simply becomes ignored and superseded by regulatory blocs based largely on geopolitical lines as the Artemis Accords and ILRS are. Moreover, without effective governance around the increasing weaponisation of space, the risk of destructive orbital events, such as Kessler Syndrome, grows, which will affect all actors regardless of intent.

To mitigate these risks, the international community must establish clearer norms against space weaponisation, such as banning ASAT weapons, and build trust through transparency measures, including shared mission data and apolitical coordination frameworks. However, geopolitical realities, such as the US's renewed focus on space-based missile defence and China's and Russia's military space advancements, undermine cooperative efforts. Fragmented space governance along geopolitical lines leads to a growing risk that competitive security measures will drive further weaponisation, increasing the likelihood that a space conflict could spill over into Earth-based tensions or conflict.

How space fits onto the escalation ladder is currently an interesting one . From my work and conversations with practitioners, I would argue that there are two broad and contradictory answers to this based on timescale, though this is an area that needs more study as it matures. Currently and for the foreseeable future, space exists outside traditional escalation ladders, meaning nations may use it as an arena for strategic manoeuvring, grey zone actions, and disruption without triggering a terrestrial-based hostile response that leads to conflict in some form on Earth. Instead, the response will be limited to space and probably will be like-for-like. This view is supported by NATO's attempts to include space infrastructure under Article 5, signalling its importance, yet no retaliatory actions through Article 5 have been initiated despite Russia's cyberattacks and disruption of Starlink's, Sweden's, and other NATO members' satellite infrastructure. The fact that NATO has taken no clear retaliatory steps or messaging to deter this, despite stating it will view these incidents on a case-by-case basis highlights that space-related attacks are removed from normal political and military considerations and escalation ladders. While space infrastructure is fundamental to modern economies, this removal is likely due to the lack of political pressure and public awareness.

In the future, however, as space activity ramps up, we could potentially see space incidents start to almost always result in Earth-based responses. This is due to the large cost of operating in space, and the increasing existential risk posed by orbital damage caused by disruptive activity or attacks either accidentally or intentionally. A debris-creating event that results in Kessler Syndrome, alongside the political repercussions globally, would make space-based orbital attacks very unattractive in a state's risk calculus. Indeed, states without space-related military capability, but who, like nearly all modern states, rely on space for communications, economic well-being, growth and indeed facilitation, would likely take damage to their space infrastructure as something which would demand a response on Earth, as that is where their capability stretches. Attacks on off-world infrastructure like lunar operations would likewise make an expensive and already highly risky endeavour more so for all parties due to the risk of retaliation and precedent-setting.

While a terrestrial response is in the short-term highly unlikely – though not impossible, as orbital missile defence will change threat calculations- targeting this would be quite sensitive in terms of messaging intent, it could flip in the future given how space powers will likely develop their space infrastructure interests. The best way to mitigate this is to **first,** multilaterally address the gaps in the OST regarding the weaponisation of space and **second,** build trust between competing space actors to achieve meaningful progress in preventing space weaponisation and defusing spillovers that may spark tensions on Earth.

The issue currently is that there seems to be very little real appetite for restraining space-based escalation at any level. The current US administration's renewed exploration of space-based missile defence is a key example of how national security priorities are overriding efforts at global space security and governance cooperation and coordination. It is highly controversial and has provided Russia and China with political ammunition to argue that the US is responsible for further weaponising space, deepening tensions and undermining legitimate concerns that the US has raised about their own weaponisation efforts. Meanwhile, both states have stalled over the banning of ASAT weapons as they manoeuvre for terms that will provide them with a strategic advantage.

How could the discovery of massive oil reserves in Antarctica challenge the Antarctic Treaty System (ATS), impact global energy markets and climate goals, and reshape international relations, particularly between Russia, China, and other global powers, while also raising legal, environmental, and security concerns?

The discovery of significant **oil deposits in Antarctica- not reserves**, as reserves imply commercially viable extraction, which is currently prohibited under the Antarctic Treaty System (ATS) – significantly exacerbates tensions over the ATS. The system has long sought to prevent resource exploitation and limit territorial competition, yet these deposits inject tangible economic value into a continent historically dominated by suppositional imperialism. This term, which I use to describe how claimant states and those reserving the right to make a claim have sought to maintain their interests through relatively low-cost sovereign presence measures in the hope or fear of missing out on an Antarctic resource bonanza, a notion first popularised by US Admiral Byrd in the 1930s.

The deposits create two primary risks for the ATS. **First**, the Environmental Protocol renegotiation in 2048 (often mischaracterised as an expiration date for the ATS). The Protocol does not automatically lapse; rather, from 2048 onwards, any single Consultative State can call for a review of its operation (whereas before this, unanimous consent is required). States are already positioning themselves for this possibility, reinforcing claims or areas of interest through presence and utilisation. If restrictions are weakened or overturned, or if negotiations falter, the ATS could be severely undermined, with key elements scrapped. Over the long term, these deposits could also reshape global energy politics and complicate international climate commitments. **Second,** the ATS could become effectively irrelevant before 2048. The treaty's consensus-based framework means that compromises over filling in gaps, like tourism, which aim to retain the ATS' viability, actually increasingly shift it towards the interests of the ATS-Changers. Moreover, the ATS lacks effective enforcement mechanisms, and states are increasingly disregarding key agreements. These trends are already visible and could lead to a scenario where, by 2048, there is little left to salvage, or the treaty has lost its relevance entirely.

What these deposits **will not do**, however, is significantly impact global geopolitics or energy markets in the near future. The ongoing struggle over the ATS, combined with the extreme operational, technical and financial challenges of profitable resource extraction in Antarctica – one of the most hostile environments for human activity outside of space- renders any short-term impact unlikely. While climate and technological advancements may eventually shift extraction towards profitability, this will occur over a much longer timeframe.

Nevertheless, the regional geopolitical implications are substantial. Antarctica has long been a peripheral but active arena of strategic competition, with states leveraging scientific diplomacy and infrastructure expansion to reinforce territorial claims. The mid-20th-century "base race" saw the UK, Argentina, and Chile rapidly expand their presence to solidify sovereignty – a strategy now echoed in China and Russia's modern Antarctic expansion efforts. While the ATS has successfully prevented open conflict since its signing in 1959, its resilience against mounting economic pressures and geopolitical manoeuvring is increasingly uncertain. These newly identified deposits add further strain

to an already fragile system, raising critical questions about the ATS's long-term sustainability.

To what extent might the ATS be gradually circumvented due to geopolitical competition, legal loopholes, and shifting state interests before the 2048 review?

Building on Professor Klaus Dodds' research, I argue that Antarctic governance is**defined by two loosely aligned factions: ATS-Maintainers and ATS-Changers**.

ATS-Maintainers benefit from the ATS and seek to uphold it as a status quo framework, prioritising scientific diplomacy and environmental conservation. By delaying escalatory competition and restricting competition through ATS mechanisms, these states can consolidate their influence (and protect claims or potential claims) while keeping the costs of competition relatively low. To reinforce their influence, ATS-Maintainers frame their Antarctic engagement through stewardship narratives, presenting themselves as protectors of the region's fragile ecosystem. However, ATS-Changers allege that they employ environmental measures like Marine Protected Areas (MPAs) to solidify their claims while simultaneously restricting the scope for new entrants, allowing them to curb external competition, limit the ability of others to establish a sovereign presence and maintain long-term geopolitical leverage within the ATS framework.

The**ATS-Changers – primarily Russia and China –** feel the ATS in its current form does not serve their interests and seek to shift the ATS towards a more economically permissive structure. Their approach relies on gradually eroding the ATS's conservation focus, exploiting consensus-based decision-making to block regulatory updates, and preventing enforcement of existing rules. By denying efforts to address emerging regulatory gaps, they create space to expand unchecked resource exploitation. Their strategy also involves ignoring or circumventing restrictions while using the ATS's own framework to prevent repercussions, aiming to shift governance away from its current environmental-scientific focus towards an economically permissive one. If successful, this could render the ATS functionally irrelevant well before 2048, ensuring that any renegotiation of the Environmental Protocol favours the ATS-Changers- or that by then, the treaty's restrictions no longer matter at all.

The oil deposits discovery may change this perception for new states, as the tangible value will likely increase interest from other states seeking to join the ATS and not be left behind on any resource benefits. While this would not benefit ATS Maintainers in the long-term, the ATS does provide, through its restrictions and rules governing the ongoing competition, an advantage as any newcomers have a long way to play catch-up to the ATS-Maintainers' tempo and records of activity and presence. This tangible resource value is also set to intensify geopolitical competition as it strengthens the ATS-Changers' argument, making it increasingly plausible that the ATS could be weakened or circumvented before 2048.

The ATS indeed imposes comparatively significant hurdles for new signatories, limiting their influence without substantial investments – something only a handful of states can afford – creating a dynamic where newer states must engage in the same suppositional imperialism as the original signatories, as China has in recent years. Here, the confirmation of oil deposits may shift this calculus, and while not triggering a major influx of new Antarctic players, they could expand the coalition advocating for a more flexible ATS.

The ATS's enforcement hinges on the ATS-Maintainers, but with China and Russia as key veto players, meaningful enforcement will remain difficult. Attempts to uphold ATS rules outside the treaty framework risk accelerating its decline, undermining the influence, territorial claims, and competitive advantages provided by the ATS that Maintainers seek to protect. Yet, compromises would also erode the ATS, albeit more slowly. Any increase in support for the ATS-Changers will further complicate this dilemma, making it harder for the treaty to survive in its current form. **While a formal collapse of the ATS remains unlikely, a more probable scenario is that the treaty will be gradually circumvented well before 2048.** States will increasingly exploit legal loopholes and weak enforcement mechanisms, expanding economic activity prior to formal policy recognition. By 2048, economic exploitation may already be a reality, and official endorsement will merely confirm an ongoing trend rather than introducing a radically new one.

How can the ATS modernise its governance to address the increasing geopolitical tensions, dual-purpose activities, and competing interests in resource exploitation from major powers like Russia and China, while maintaining environmental conservation and international cooperation in the region?

It is highly unlikely that ATS will be able to modernise while China, Russia and increasingly other states want to see a more open ATS that considers their sovereign interests and facilitates a wider range of economic-centric activities, rather than simply the perspective of the original 12 signatories. As experts like Professors Shirley Scott and Alan Hemming have highlighted, the original 12 heavily benefit from the ATS in its current form, as it sets high barriers to entry, requiring substantial investment in Antarctic science to gain influence and voting rights. This discourages newer states from positioning themselves for potential future claims, keeping competition limited to a select group – a situation China portrays as a "rich man's club", a perspective that taps into current Global South concerns surrounding how international governance operates, and in whose favour, at large.

For ATS-Maintainers, the challenge is twofold: they must defend why the current ATS works, demonstrating its continued value and effectiveness, and they need to address growing demands for reform, particularly by lowering barriers to entry and expanding meaningful representation for Global South states in an increasingly multipolar world. Here, expanding voting membership would be a logical first step, but it alone will not be enough. Without addressing China's core demand – facilitating economic exploitation – this would only accelerate the ATS fragmentation, as newly empowered states could further undermine the treaty in favour of resource exploitation, weakening the ATS faster, rather than preserving it.

If the ATS is to remain relevant in the 21st century, it must explore how to incorporate commercial activities within a regulated framework, balancing economic interests with environmental protections. Without this, economic activity will eventually happen, before or after 2048, but without the oversight mechanisms that the ATS currently provides – this is already seen with tourism, where around 50% of activity happens outside the ATS-affiliated International Association of Antarctica Tour Operators. Once other economic activities begin outside ATS regulation, states will have far greater leeway in setting their own environmental standards – likely weakening conservation efforts. To get ahead of this risk, revisiting the 1988 Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA) would be a good starting point. While it was never ratified, its core principle, that mining could only proceed if all parties agreed there was no environmental risk, remains a viable starting point between the ATS-Changers and ATS Maintainers for modern adaptation and negotiation.

The biggest challenge is whether ATS-Changers are even interested in maintaining a regulated system. Engaging with them now, rather than waiting until 2048, offers the best chance for a workable solution. If discussions are postponed in the decade or beyond, the global shift toward multipolar blocs prioritising national interests, alongside intensifying geopolitical competition, will likely erode any willingness to accept strict multilateral regulations. By then, ATS-Changers will have already conducted extensive resource exploration, identified key sites, and accounted for geopolitical tensions in their strategic planning. At that point, they may no longer be interested in negotiation to keep the ATS relevant at all.

What is the most important advice you could give to young scholars of International Relations?

While this advice is particularly relevant for those working outside academia in practitioner roles, it is equally useful for those treading the academic path.

First, build a strong and diverse network. Networking is essential, not just for career progression, but for adding value to your work and ensuring your research and analysis are impactful. Connect with interesting people in your field, those in adjacent disciplines, and even those loosely related to your work. Practitioners, in particular, offer valuable insight as they operate on the front lines of geopolitics and policy. Do not just connect with those you agree with. The most important developments can come from you respectfully listening to the perspectives of someone whose analysis or perspective is at odds with your own. It can help challenge your biases or hone your arguments (keep it respectful of course!). Most people are happy to have a 15-minute virtual coffee and answer a few questions, so do not hesitate to reach out. You never know what opportunities might emerge from a simple conversation.

Secondly, apply the 60/40 rule in your work . One of the best pieces of advice I received at RUSI was to balance your expertise and output using this 60/40 rule. 60% of your research and analysis should focus on your specialist areas—building your reputation through publications, projects, and client work and 40% should focus on related but broader topics—expanding your knowledge base and ensuring adaptability in a rapidly shifting geopolitical landscape. The jobs market in geopolitics and international affairs is incredibly tough. While specialisation is critical, over-specialising can be risky. Geopolitical focus areas shift unexpectedly, and funding for specific topics can dry up overnight.

A good example is the Afghanistan and Iraq era, when many young professionals specialised in Middle Eastern affairs and learned Arabic, while Russian and Eastern Europe specialists struggled to find work. But by 2016, China had become the main strategic focus, and many Middle East specialists found limited job opportunities—just as Russia was re-emerging as a critical area. Geopolitics is messy and unpredictable. Diversifying 40% of your output into adjacent fields ensures that if funding shifts, you are not left stranded. It also strengthens your professional reputation beyond your core specialism, making you more competitive and adaptable in an uncertain job market.