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Does the successful cooperation between the United States  
and Russia on the International Space Station challenge  
realist international relations theory?

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'I declare that this dissertation is my own work, and that where material is obtained from  
published or unpublished works, this has been fully acknowledged in the references.'

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## **Abstract**

Cooperation between the United States and Russia on the International Space Station programme has continued despite the increasingly conflictual nature of their inter-state relations more generally. This suggests a hypothesis - which this work rejects - that there is something special about this programme which leads to it being elevated from 'normal' inter-state relations. Perhaps its status as scientific rather than political or perhaps the impression that it is for humanity rather than for a specific nation has put it beyond 'normal' politics. If true, this would have been significant for international relations theory and provide much hope for the future. Unfortunately, however, the core argument of this work is that it is not true. The development and continued success of the International Space Station programme – from the signing of the intergovernmental agreement in 1998 to the ongoing crisis in Ukraine - can be explained using the realist framework based around self-interested nation states. Alternative framings of the programme, which challenge the assumptions underpinning that theory, which cast the cooperation on the International Space Station as the intended basis for the spillover of cooperation into related fields, as an international mission for humanity, or as an increasingly commercialised capability are considered but rejected. It is therefore necessary for all involved in space travel - whether trips to low-earth orbit, successor space stations, missions to the Moon or Mars or beyond - to always consider the geopolitical context when developing their plans.

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## **Introduction**

Cooperation between the United States (US) and Russia on the International Space Station (ISS) programme has continued despite the increasingly conflictual nature of their inter-state relations more generally. This suggests a hypothesis - which this work rejects - that there is something special about this programme which leads to it being elevated from 'normal' inter-state relations. Perhaps its status as scientific rather than political or perhaps the impression that it is for humanity rather than for a specific nation has put it beyond 'normal' politics. If true, this would have been significant for international relations theory and provide much hope for the future. Unfortunately, however, the core argument of this work is that it is not true. The development and continued success of the ISS programme – from the signing of the intergovernmental agreement in 1998 to the ongoing crisis in Ukraine - can be explained using the realist framework based around self-interested nation states. Alternative framings of the programme, which challenge the assumptions underpinning that theory, which cast the cooperation on the ISS as the intended basis for the spillover of cooperation into related fields, as an international mission for humanity, or as an increasingly commercialised capability are considered but rejected. It is therefore necessary for all involved in space travel - whether trips to low-earth orbit, successor space stations, missions to the Moon or Mars or beyond - to always consider the geopolitical context when developing their plans.

The first chapter will summarise the realist theory of international relations, within the broader context of international relations theory. It will then consider the reasons for Russia and the US requiring the ISS in two steps, adding detail of the theory as necessary. Firstly, it will outline how both nations feel they need an inhabited space station for three

key reasons - for prestige, to develop economically beneficial technology, and for dual civilian/military capability. Both the US and Russia see themselves in the top-tier of nation-states in global politics and consider a presence in space a necessary component of that (as well as a key aspect of their military capability), and the capability to send people into space is the most prestigious aspect of that. Scientific progress is both enabled and driven by space stations. Experiments on processes usually masked by Earth's gravity are made possible, and the requirement to support the health of the station's inhabitants from Earth drives a requirement make progress in remote healthcare. While these are likely to lead to profitable technology development, the major driver as far as the nations' economies are concerned is space-launch technology - especially the capability to transport people to and from orbit. Secondly, it will outline the reasons why no nation-state is currently able to develop a space station alone, driving a requirement for the space station to be international. While the Russians had developed the Mir space station during the Soviet era, it has not been possible to sustain investment since the end of the Cold War. The US faced domestic opposition from their congress when Russia was under consideration as a potential member of the programme, which was in part overcome by counter-proliferation arguments relating to ensuring the employment of Russian rocketry experts. Also, the US benefited from Russian expertise and experience from their Mir programme from the start, and since the retirement of the Space Shuttle they have relied on the Russian Soyuz capability to transport their citizens to and from the space station. So, at this point, an international space station is the only option for both nations to achieve their own self-interested aims.

The second chapter will consider the challenges to cooperation between Russia and the US, and show that it has never been in the US or Russia's interests to let increasingly

conflictual relationships affect the ISS. A case study on the proposed US missile defence system in Europe explores the reasons why US withdrawal from the Anti Ballistic Missile (ABM) treaty did not challenge US-Russian cooperation on the ISS programme despite the significant threat perceived by Russia. A case study on the nonproliferation concerns linked to the alleged Iranian nuclear weapons programme combines some of these issues with those of sanctions on a third country, and the case study on the crisis in Ukraine allows consideration of the effect of sanctions being placed by Russia and the US on each other - sanctions that have avoided damaging the ISS so far, although it's future post-2020 has been put into doubt.

The final chapter will consider arguments that appear to indicate that the ISS programme represents evidence that the assumptions underpinning the realist theoretical framework are wrong. It will argue that while scientists and engineers may consider themselves beyond politics, they rely on the nation states having an interest in cooperation. It will look into whether spillover of cooperation into other areas was considered a potential added bonus rather than part of the calculus of relative power balance, but rejects this. It will also look into the arguments that the programme is for humanity rather than for a particular state, undermining the primacy of the state, but conclude that there is evidence in the setup and running of the ISS against this view. It will consider the growing private investment in space launch technology, and the growth of private sector space companies as more evidence against the state-led view presented up to this point, but argue that the state has maintained its place as the key focus.

The conclusion will summarise the arguments made in each of these chapters, and reiterate how they support the core argument that the realist framework is sufficient to explain

international cooperation on the ISS programme. It will finish with consideration of what this means for the future of international cooperation in space and on cooperation in international relations in general.

# Chapter 1 - The Need for an International Space Station

## Introduction

The aim of this first chapter is to answer the question of why the states that contribute to the ISS programme - in particular the US and Russia - feel they need an inhabited international space station<sup>1</sup>. There are many different theories of international politics, and attempting to understand the world using each of them brings different issues to the fore. The first section of this chapter will introduce the realist family of international relations theories which I argue is entirely consistent with the history of the ISS programme. My argument is not that the other theories add nothing - in fact Chapter 3 will consider challenges to the assumptions underpinning realism - but that the continued cooperation on the ISS programme does not provide evidence against, or an exception to, the realist view of the world. The key message of this work is that there has been nothing special about space exploration that has put it beyond competitive geopolitics. The second section of the chapter will focus around the key reasons why self-interested nation states feel they need an inhabited space station - for prestige, to develop economically beneficial technology, and for dual civilian/military capability. The third and final section of this chapter will show that no single country has been able to develop an inhabited space station on its own which has driven the requirement for an international programme, albeit in the narrow sense that more than one nation-state is involved rather than the broader, all-inclusive sense.

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<sup>1</sup> The ISS refers to the International Space Station currently in orbit around Earth, capitalised and using the definitive article. An international space station - spelled out and using the indefinite article refers to a more general case.



## **The Realist Theory of International Relations**

This first section begins with a very brief outline of some different types of international relations theory, both in order to enable this work to be properly located within the existing literature and to make clear my own philosophical approach to the study. It will explain why I have taken a descriptive rather than a normative approach, and also why I have focused on the realist theories rather than idealist (accepting that these last two labels are not value-neutral!) It will then cover the realist theory in more detail, which the subsequent sections will further develop alongside the more specific case of space stations.

There are two distinctions that must be made clear. The first is between descriptive and normative theories of international politics. This is not an argument about which type is best, it is simply a classification. Descriptive theories describe the world as it is, or has been. In practical terms they can be (mis?)used by political leaders and their advisors to encourage pragmatic action in line with what the theory suggests can be expected of others, leading to an apparent self-fulfilling prophecy wherein the future looks like the past. Normative theories have a different aim in mind - they attempt to show how international politics could work if we made changes. The problem that these theories tend to have (in my opinion) is well summarised in the joke where a local, upon being asked for directions to someplace, replies "well, I wouldn't start from here!". We have to start in the world described by the descriptive theories, and if an alternative attained enough support the transition from the old ways to the new will necessarily begin under the old order - returning us to the arguments for pragmatism that can be so self-defeating. Smith has described a forty-year detour in which he perceived that it was considered unacademic to introduce normative concerns unless they were themselves the object of

analysis (described in Schmidt, 2002, p15). I do not consider normative works to be unacademic, but work that ignores the realities of the present will not result in successful change. To be clear, the aim of this work is to describe how the ISS programme has developed and not to endorse that history or imply that the future must be like the past, nor does it reject normative theories. As Wendt (1992) has argued, “anarchy is what states make of it” – it is possible to change the system if states create a more positive form of anarchy. In fact most of the ISS partner nations are enjoying more productive forms of relationship despite the lack of a central authority – but it is the exception represented by Russia that is the focus of this work and unless something is changed, there is no reason that the future will not rhyme with the past<sup>2</sup>.

The second, related, distinction is between the so-called realist and idealist theories. The standard story told in international relations textbooks is that after the First World War the field of international relations developed in order to work out how to avoid such terrible conflict from happening again, alongside the setting up of the League of Nations. The run-up to and experience of the Second World War led to the rise of another set of theorists who claimed – as war returned and the League of Nations collapsed - that the focus on international law, international organisations, interdependence, cooperation and peace had failed and had been merely idealistic. These new theorists considered themselves the realistic ones who focused on power politics, security, aggression, conflict and war (see, for example, Jackson & Sørensen, 2010). The labels ‘idealist’ and ‘realist’ were chosen by these new theorists from their ascendant position. It is important to understand, as Schmidt has argued (2002, pp10-12) that the interwar theorists were not

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<sup>2</sup> The quote "History doesn't repeat itself, but it does rhyme" is attributed to Mark Twain.

idealistic utopians but had a “*practical mission to reform the practice of international politics*”, and so are not to be rejected as unrealistic. While I do not claim that there is no place in a descriptive theory for the things idealists focus on – international law, international organisation etc., my argument is that the ISS programme is entirely consistent with the world as expected under realist theory, misnamed as it may be, so the final part of this first section will focus on this.

Realist scholar Hans Morgenthau argued that there are two key aspects to the realist theoretical framework – a continuity with domestic politics and a discontinuity. He argued that international politics was, like domestic politics, characterised by a continuous struggle for power. He also argued that international politics was different to domestic politics in that there is no central authority – it is anarchic (1948, summarised by Schmidt, 2002, p9). Schmidt has summarised the common tenets of realism as:

- *“The sovereign state is the most important actor in international politics*
- *State behaviour can be explained rationally*
- *States are unitary actors*
- *There is a sharp distinction between international and domestic politics*
- *States pursue power in an anarchical self-help setting*
- *Issues of war and peace are paramount” (ibid)*

These tenets summarised by Schmidt act as assumptions underpinning a model of the international system, and models are necessarily abstractions. The guidance of statistician George E.P Box that “[s]ince all models are wrong the scientist cannot obtain a ‘correct’ one by excessive elaboration ... [and so they] must be alert to what is importantly wrong”

(1976, p792) is instructive. Models cannot be 'correct' – but they can be *useful*<sup>3</sup>. It is my claim that the history of the ISS programme does not provide evidence that any of these six tenets of realism are importantly wrong – i.e. the history of the ISS programme is consistent with realism and supports its usefulness in describing international politics. This chapter will show that states in an international system described in these terms would feel that they need a space station, and that since no single state has been able to create its own it has been in the states' national interests to co-operate (as will be shown, in such a way that keeps national interests protected). The next chapter will show that none of the challenges facing the partner nations have been serious enough to break that cooperation – states' national interests have always been served best through the continuation of the ISS programme. The final chapter will consider challenges to these tenets, and will argue that they are insufficient to invalidate realism's usefulness as a (and I argue the primary) theory of international politics.

Cooperation under such a framework seems to be unlikely, and realism does work best when explaining issues around competition, but it is possible. Here, the work of Grieco provides the appropriate framework. In defending the realist understanding against the alternative of liberal institutionalism – which claims that institutions allow states to cooperate under conditions of anarchy (1998, p486) – Grieco identifies two barriers to cooperation in realism as opposed to just one in liberal institutionalism. He accepts the barrier recognised by liberal institutionalist theory that states operating under an anarchic self-help setting have no way of knowing whether another state will cheat, there is no central authority to ensure cooperation (ibid, p487). The second barrier involves the

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<sup>3</sup>I have been unable to find the source for a quote commonly attributed to Box "all models are wrong, but some are useful".

nature of the states' pursuit for power – realist theorists argue that they are concerned not just about the *absolute* gain in power but also about gains in power *relative* to the other states in the system (ibid). States may therefore forego a chance to increase their absolute power through cooperation (for example, agreeing to build a space station) if they are concerned about the other state cheating or gaining more from the programme. As opposed to an offensive reading of realism, where states aim to tip the balance in their favour, using cooperation where this is the best method, Grieco's realism is defensive in nature – cooperation can happen, but the theory indicates that the two barriers must be overcome: assurance that others will not cheat (perhaps via institutions); and a belief that others will not gain more out of cooperation. The sensitivity of states to this second obstacle can vary depending on history – in particular how far (if at all) the partners have developed what Deutsch termed a 'pluralistic security community' (ibid, p501) – it is more likely, for example, within Europe – which is why I have chosen the US-Russian cooperation on the space station as the most testing case for this work.

The US-Russian cooperation on the ISS programme overcame both of Grieco's barriers to cooperation, aided by the reduced sensitivity to the barriers in the immediate post-Cold War environment. In these years, the confrontational Cold War relationship was replaced with an outwardly friendly one, with a strong relationship between US President Clinton and Russian President Yeltsin – who met 18 times over the 7 years that they both held office and oversaw the creation of the 'Partnership for Peace programme' between the (then smaller) North Atlantic Treaty Organisation (NATO) and Russia (US Department of State, 2014). As part of this new relationship, the US gave Russia \$1 billion worth of aid to "*promote free-market skills on a grass-roots level in both Moscow and the Russian countryside, so the movement toward democratic reform would continue no*

*matter who governs in the Kremlin*” (Friedman, 1993). US support was at such a high level at this point that Yeltsin even voiced concern that it made him look like a *‘lackey of Washington’* (ibid). From a realist perspective this can be understood as the US taking advantage of their newly challenge-free position at the top of a unipolar global order to ensure that that order remained stable – chaos in Russia would not have been in the US interests. As Chapter 2 will show, this overwhelmingly positive relationship would not last long – but it was the relationship that was in place in 1998 when the ISS agreement was signed.

But this reduced sensitivity only enabled the cooperation – Grieco’s barriers still needed to be overcome. In terms of the relational power barrier, in addition to the US consolidating its position as the dominant pole the cooperation needs to be seen in a wider context.

Russia as a failed state would consist of a threat to the U.S. via escape of sensitive weapons technologies (see Chapter 2) and result in the rise of countries seen as more of a threat, for example Iran and China. Under the realist framework it is not the case that each individual bilateral relationship aims to increase one’s power relative to the other – especially when the overall positions are not likely to change. Rather it is the maintenance of a system with the US as the sole superpower that is the goal – making friendlier countries stronger can be a rational strategy. To understand how the US and Russia could be assured that the other would not cheat – especially given that no international institution was created – we need to look at the series of agreements that were signed in 1998. The key line in the intergovernmental agreement is article 5 – *“each partner shall retain jurisdiction and control over the elements it registers and over personnel in or on the Space Station who are its nationals”* – which extends the national jurisdictions of the partner nations into outer space (ESA, 2014). The Russians and the Russian modules are

considered part of Russia; the Americans and the US modules are considered part of the US<sup>4</sup>. While the US maintains primacy in decision-making and holds veto power, the Russian modules are exempted if this power is used (Yakovenko, 1999, p82). Intellectual property rights are protected under this arrangement and cooperation is based on a bartering system – nations cooperate by agreeing fair swaps of capability without exchange of funds (ibid). Chapter 2 will outline the challenges to this cooperation as the US-Russian relationship has declined, but as of 1998 – the barriers that Grieco described were overcome through the detailed contractual arrangements involved, as described in detail by the head of the Russian delegation (Yakovenko, 1999).

### **The Need for an Inhabited Space Station**

In October 1957 the Soviet Union successfully launched the first artificial satellite - Sputnik 1 – into orbit (Trevino, 2013). In doing so, they raised the stakes of the superpower competition by introducing a space component – a move so significant that the phrase “sputnik moment” is now used to refer to the sudden realisation that a competitor has taken a significant advantage. Today, 52 countries have space-related interests to varying extents (Space Foundation, 2014). The Soviet Union once again raised the stakes in 1961 when Yuri Gagarin became the first human in space (Bergen, 2013). Only three countries have had the capability of sending humans to space: the US, Russia and China (Ramesh, 2009). And after the retirement of the US Space Shuttle, only Russia and China have a current capability. Of course, the US is considered to have won the space race after the successful Apollo 11 mission to put men (they were all men) on the moon (Trevino,

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<sup>4</sup> Special rules govern a single ‘European Partner’ – but this is beyond the scope of this work.

2013) – but this capability has also lapsed. The key point is that space capabilities are now considered an important aspect of a state’s capabilities, of the 52 states with a space programme only the US, Russia and China have sent people to space and only the US has sent people beyond the Earth’s orbit, and this elevates them to the top tier of space-faring nations. But why is space considered a vital component to state power? And why is an inhabited space station in a low-Earth orbit currently seen as the requirement to be considered in the top-tier of nation-states?

The answer to the first question is that a space capability gives states key advantages in terms of both hard and soft power. The hard power component – “*the ability to use the carrots and sticks of economic and military might to make others follow your will*” (Nye, 2003) – comes from the close links between civilian and military capabilities in space. The soft power component – “*the ability to get what you want by attracting and persuading others to adopt your goals*” (ibid) – comes from the reputation and prestige associated with the capability, as well as a recognition of expertise that can be expected to win influence when international rules are being developed. Each of these will be considered in turn before the focus narrows onto the requirement for inhabited space stations.

The military utility of space has been recognised by scholars since at least 1965 when Bloomfield wrote in *International Organization* that “[*The US and the Soviet Union are*] reportedly at work developing, among other things, manned space platforms, a fundamental first step in establishing a controllable and potentially versatile military presence in space” (Bloomfield, 1965, p604). He states that the ability to manoeuvre and rendezvous in space as well as position weapons in the “*strategic suburb of earth*” (ibid)



is of particular significance. This may now seem far-fetched and more in the realm of science fiction than serious academic debate. There are two responses to this. Firstly, the UK's National Security Strategy (2010, p27) contains a tier-two risk of “[s]evere disruption to information received, transmitted or collected by satellites, possibly as the result of a deliberate attack by another state”. This was considered a higher risk (taking likelihood and impact into account) than the tier-three risks which include conventional attacks on NATO or EU states or UK overseas territories (2010, p27), perhaps due to the successful anti-satellite weapons test by China in 2007 which was confirmed by the US National Security Council (BBC, 2007). But it is the role of dual-use technology – i.e. that which has a civilian and military use – which leads states to consider space technology important even if they do not perceive a threat today.

*“To be sure, the first earth satellite experiments were conducted under the banner of the International Geophysical Year (IGY). But the booster rockets that made it possible for the Soviet Union to be spectacularly first under that banner were originally developed to hurl an intercontinental ballistic missile across vast distances on earth.”* (Bloomfield, 1965, p603)

The quote above forcefully illustrates the link between civilian and military technologies in space, and its reverse is also apparent – building better ways to get into space also provides better military capabilities. Similarly, space capability allows satellite communications, global positioning systems, and surveillance (DCDC, 2010, p3-1) – which can all be used for military as well as civilian purposes. In addition to this, classified missions such as the 674 day orbit of the US Air Force X-37B that finished in October 2014 (BBC, 2014c) indicate further military uses of space. Sweet assesses that

Russia sees itself as a leader and innovator in its predominantly military (1998, p150) space capability and “*do[es] not wish to be left out of the potential commercial and military benefits of space*” (ibid, p136). This includes “*capability to provide effective space-based support to Russian land forces ... and to deny the use of space to others*” (ibid, p150). She is not blind to the similarities in US motives however – noting that the capability to deny space to others was also something others were aiming for. The current military uses of dual-use space capability, alongside these military-owned missions therefore contribute to the states’ pursuit of power. But the ability to use the capability developed for peaceful, civilian means for military means in the future also contributes to forward-looking states calculations of relative inter-state power.

Moving away from the current and potential hard power benefits to states with a space capability, there are also softer aspects. These relate to the state’s economic performance, reputation, recognised expertise and the potential for these to provide influence in international debates. Sweet states that full membership of the ISS programme was such a matter of pride for Russia that they were publicly annoyed at the prospect of the first commander being an American (1998, p138). In one respect this could fall under soft power because it relates to reputation in a technologically advanced field – but it is a very nationalistic seeking of reputation. This leads to the suggestion by Luzin that one of the key advantages of being in the top tier of space-faring nations is that they can influence both the objectives set by others and also the shaping the international space agenda (2013, p1). This influence is valuable given the current and potential future military uses covered above, and international agreements fit within the realist theoretical framework if they are understood as securing the interests of the powerful. And states have a clear interest in the functioning of their own economy, so any comparative advantages that can be gained

through state intervention in space launch technology or via microgravity experiments in space are actively sought.

So, space capability is valued by self-interested states who therefore invest significant amounts of money into this area. But the US sent men to the moon in 1969 – so why is it that top tier nations do not feel the need to be able to send their citizens beyond low earth orbit? Why is an inhabited space station the goal? Note that China, who were not allowed to participate in the ISS programme due to US objections (CNN, 2007) have had success in temporarily inhabiting their Tiangong space station (Gonzales, 2011) – so there is competition at this level. The reason is that it was the specific conditions of the superpower confrontation in the Cold War (see Trevino, 2013) that drove the stakes so high as to push the US to send men to the moon despite the huge costs (Cox, 2014, 27:00). Since the end of the Cold War, NASA's aims have been to consolidate their capability of getting people into low-earth orbit so that it can become to some extent routine and be passed on to commercial operators to free up NASA to look at the next steps (NASA, 2013b). The standard for a top-tier state is therefore currently set as the capability of sending people (with priority for their own citizens) to a space station in low earth orbit. The US, Russia and China all have (or have had) that capability, but none have an entirely sovereign capability of a permanently inhabited station. Chinese astronauts have spent only a few days on-board the Tiangong, which is usually uninhabited. Still the most significant achievement – and the focus of this work – is the ISS programme, which represents both the Russian and US capabilities (as well as other, smaller, partner nations which are allied to the US). The final part of this chapter describes why a US or Russian sovereign inhabited space station has not been possible, and also the reasons why the

realist theoretical framework is sufficient to understand this cooperation between the rival top-tier nations.

### **The Need for an International Approach**

While the US and USSR did cooperate in space during the cold war, especially during the *détente* period, for example in the Apollo-Soyuz missions of 1975 (Yakovenko, 1999, p80), plans for inter-state cooperation on a US-led space station were limited to allies of the US and NASA was to have clear political authority and to provide all components critical to its success. Space agencies in Europe, Canada and Japan were to be able to provide additional modules to add new capabilities, and they were to be able to send their citizens to the prospective space station. It was considered by US President Ronald Raegan to play the role of a civilian parallel to the overtly military Strategic Defence Initiative (a space-based missile defence shield) in his country's rivalry with the Soviet Union (Sadeh, 2013, p15-16). While this level of cooperation is deservedly praised by many (including *ibid*), it can be readily understood in the terms of the tenets of realism outlined above. War and peace are paramount for realist theorists, and a key enabler to this cooperation is that all of the members of the project as foreseen at this point were dependent on the US for their own national defence – Europe and Canada through NATO and Japan through the post-World War II settlement with the US (see NATO, 2014 & Columbia University, 2014 respectively).

The key point in the history of the ISS programme for both Sadeh and Yakovenko came in 1991 when the dissolution of the Soviet Union triggered a convergence of interests between Russia and the US (Sadeh, 2013, p7 and Yakovenko, 1999, p80). This convergence reached a height with increasing US-Russian cooperation following the attacks of 11<sup>th</sup> September 2001, leading to Russian membership of the World Trade

Organisation and the Group of 8 (G8) and even led some to wonder if a US-Russia relationship could become more sustainable than a US-European one (e.g Stent and Shevtsoza, 2002). These good relations enabled cooperation; they were necessary but not sufficient factors. Additional factors in both Russia and the US combined to reach a level sufficient for cooperation. The collapse of the Soviet Union meant that Moscow lost natural resources, industrial bases and key components of their space capability which were now located in foreign countries (Baker, 2012, p18) – making the Soviet-era space programme unaffordable. Russian official figures show a reduction in their space budget of 80% between 1989 and 1994, and after the cancellation of their ‘Buran’ Space Shuttle and the failure of their unmanned mission to Mars, the ISS was the only major project the Russians were considering (alongside the routine launching of unmanned satellites into Earth orbit) (Sweet, 1998, pp 140 & 153). But the fact that many individuals within Russia maintained their technical know-how and access to remaining resources presented a threat to the Russian government (Höhl et al, 2003, p11) – which the West also recognised. Ensuring that these individuals had employment, so they would not look for work for countries which neither the US nor Russia trusted, was a high priority for both, meaning that even if Russia could have accepted the loss of prestige there was a common interest in maintaining the capability – Sweet goes further to suggest that cooperation on the ISS programme may have been a way of ensuring the financial viability of the Yeltsin government (1998, p136). In fact her research suggests that the Russian Space Agency got as much money in 1997 from the US in return for use of their Mir space station that they got from their own government (ibid, p153). From the US perspective, Russia’s experience of manned space flight over 20 years was considered a valuable asset (Yakovenko, 1999, p80), leading to President Bill Clinton to direct NASA to include Russia in the ISS Programme (Baker, 2012, p18) even at the cost of sharing the lead

authority and control over the 'critical path' components (Sadeh, 2013, p17), though the US did maintain ultimate control outside the Russian segments. These incentives, combined with the enabling moment of the end of the Cold War, proved both necessary and sufficient factors for cooperation based on US and Russian self-interest and therefore is comprehensible using the realist framework.

## **Conclusion**

The core argument of this work is that there is nothing special that puts the ISS programme somehow beyond inter-state politics and that the cooperation between the US and Russia on that programme can be understood under the framework of so-called realist international relations theory. In support of that argument, this chapter has covered a lot of ground. I started by outlining the distinctions between descriptive/normative and realist/idealist theories, and explained that while this work is based on descriptive accounts and a realist framework this does not imply endorsement of the current state of affairs, nor does it imply any disdain for those who have been labelled idealist or normative. I then outlined the realist theoretical framework including a set of guiding tenets that describe a broad range of theorists without going into detail on competing realist theories which is beyond the scope of this work. Based on this framework, I then outlined the reasons why self-interested states operating in an anarchic international system feel the need for a space capability – including prestige, economically beneficial civilian technology which could be switched to military use, and overtly military use. I also explained that the landing of men on the moon was an expensive one-off possible only in the special conditions of superpower confrontation of the Cold War and that the current top-tier of space capability is a permanently inhabited space station. Finally, I explored the reasons that no single

nation has achieved this on their own and why it was in both the US and Russian national interest to agree to cooperate on the ISS programme, enabled by the particular international environment of the immediate post-Cold War years.

This chapter has been one-sided in nature in that only arguments supporting my core argument have been covered. This is intentional as it sets the backdrop for the rest of this work. In Chapter 3 I will cover alternative framings of the history of the ISS that challenge the assumptions underpinning the realist theory presented thus far, and present my arguments for why, while they do add to our understanding, they ultimately do not provide evidence against the realist framework being a useful (and I would argue the primary) model for understanding cooperation between the US and Russia on the ISS programme. Before considering these alternative perspectives however, Chapter 2 will explore how the cooperation has continued as US-Russian relations have deteriorated since the post-Cold War high. I will argue that the continued cooperation despite the disputes over US Missile Defence in Europe, the disagreements over the Iranian nuclear programme, and Russian interventions into Ukraine (2014) can all be understood using the realist theoretical framework. This is a model of the international system that considers rational, unitary, states to be the primary actors in international politics, which is unique due to its anarchic nature which causes states to pursue relative power advantage over competitors, therefore elevating issues of war and peace to the top of state concerns.

## Chapter 2 - Challenges to International Cooperation

### Introduction

The previous chapter outlined - in the context of the realist framework - why both the US and Russia want to operate an inhabited space station, and why neither has been able to develop a national solution to this requirement. Framings of the history of the ISS that challenge the underpinning tenets of realist theory will be considered directly in the next chapter. But just because both nations want the same thing is no guarantee that they achieve it by working together, especially when the world is understood using the realist framework of international relations. Since the end of the Cold War, the relationship between the US and Russia has become increasingly conflictual - culminating in NATO ending all '*all practical civilian and military co-operation with Russia*' in response to the annexation of Crimea by Russia (BBC, 2014a). At an event to mark the 25<sup>th</sup> anniversary of the fall of the Berlin Wall, former Soviet President Mikhail Gorbachev – credited with creating a more liberal atmosphere in the Soviet Union that allowed rapprochement with the West – accused the West (and the US in particular) of triumphalism and stated that "*the world is on the brink of a new cold war*" (BBC, 2014d). Against this deteriorating backdrop, the ISS programme has however continued. This chapter examines the challenges to cooperation between the US and Russia, and shows that despite the problems, the national interest of both nations has still been to cooperate. Three case studies are presented to illustrate this: US missile defence in Europe; sanctions placed on Iran in response to alleged development of weapons of mass destruction; and sanctions placed by the US and Russia on each other during the recent Ukraine crisis. The case study on the proposed US missile defence system in Europe explores the reasons why US



withdrawal from the ABM treaty did not challenge US-Russian cooperation on the ISS programme despite the significant threat perceived by Russia. While a complex web of interacting treaties could have been damaged by the US action, Russia's response consisted of a more direct balancing act. The case study on the disagreements between the US and Russia over responses to the alleged Iranian nuclear weapons programme combines some of the issues raised in the first case study, but will focus the effect of US (and Western) sanctions on Iran on wider US-Russian cooperation. It will show that while US-Russian relations were affected, the issue was not sufficient to push either nation to risk the ISS. The final case study is the 2014 crisis in Ukraine, that led to sanctions being placed by the US and Russia on each other directly. Still, these sanctions avoided damaging the ISS Programme, at least in the near term.

Challenges to the assumptions that underpin the realist theoretical framework are considered in the next chapter, but the conclusion is that the realist framework - based around national self-interest - is robust to these challenges and sufficient to explain why cooperation between the US and Russia has continued on the ISS Programme despite the increasingly conflictual nature of relations between the two countries.

### **Case Study I - US Missile Defence in Europe**

In December 2001, US President George W. Bush announced that the US would be withdrawing from the ABM treaty<sup>5</sup> to allow him to press ahead with developments for a

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<sup>5</sup> The ABM treaty was the latest in a line of nuclear control and disarmament agreements between the US and the Soviet Union. Detail is beyond the scope of this work, but a summary can be found from the Council on Foreign Relations (CFR, 2014).

US Ballistic Missile Defence (BMD) (Steff and Khoo, 2014a, p236) – a follow-on from the Raegan-era Strategic Defence Initiative mentioned in Chapter 1. While the stated threat against which this defence was necessary were ‘rogue states’ (which were understood to be Iran, Iraq, Libya, Syria and North Korea – Washington Institute, 2003) this plan would simultaneously undermine the Russian nuclear deterrence (by providing a capability that could successfully defend against it) and reinforce US primacy (Steff and Khoo, 2014a, p237). Steff and Khoo summarise the situation: “*In a nutshell, in the shadow of Washington’s immense power and commitment to expand BMD, Moscow and Beijing felt they had no other option but to assume they were the intended targets*” (ibid, p240). This is an example of the security dilemma apparent under the realist framework whereby a vicious circle is set in motion by states assuming the worst of each other in unclear security situations (Herz, summarised in Waltz, 2010 [1979], p186). Even if the Russians were to trust the US’s intentions, they were also wary of the intentions of their near neighbours Poland and the Czech Republic who had agreed to base elements of the US system on their soil (Steff and Khoo, 2014a, p232) – particularly as Poland had also agreed that the US would base Patriot missile batteries in the country for protection (ibid, p244), and not helped by public statements by Polish officials that they considered Russia the real threat (ibid). This agreement between Poland and the US coincided with a Russian intervention in Georgia – but was cancelled after a reassessment of BMD by the Obama administration (Steff and Khoo, 2014b, p18). Given the primacy of issues of war and peace in realist theory, how was cooperation on the ISS programme maintained? To understand why cooperation on the ISS was not threatened by US withdrawal from the ABM treaty, consider the goals of both states. The US goal was to develop a missile defence capability, while minimising any losses to national capability, to zero if possible. The Russian goal was to maintain the nuclear balance of power, as well as minimising

losses to their national capabilities. The ISS, as a shared capability, was valued by both the US and Russia for the reasons outlined in the previous chapter. Russia could only have threatened punitive action related to the ISS if it were willing to lose that same capability.

The immediate Russian response was to withdraw from the START<sup>6</sup> II treaty (as predetermined at its signing), but both countries were committed to reducing the number of nuclear weapons from the ~6,000 allowed under SALT<sup>7</sup> I (with the desire from the Russians arising from technical and financial issues) (Arms Control Association, 2014). The 2002 Strategic Offensive Reductions Treaty was the diplomatic resolution to the US withdrawal from the ABM treaty – but the Russian response was not complete there. Russia had previously abandoned its ‘no first use’ policy in response to NATO’s superior conventional capability (Steff and Khoo, 2014a, p236), but against the backdrop of US withdrawal from the ABM treaty its nuclear policy was loosened further to allow it to use nuclear weapons in order to “*deter smaller scale wars that did not threaten Russia’s existence*” (ibid, p247). In addition, improvements were made to Russian nuclear capability in the areas of missile countermeasures (multiple re-entry vehicles to give the missile defences too many targets) and also in manoeuvrability (with the addition of road-mobile intercontinental ballistic missile system) (ibid, pp246-7). Sweet’s research on the Russian space programme led her to conclude that “*Russia will likely do what is necessary to keep the West involved in Russian-American space ventures*” (1998, p155) – based on the desire to remain in the top-tier of space-faring nations. The response from Russia was an attempt improve their capabilities to return the relative power relations as close as

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<sup>6</sup> Strategic Arms Reduction Treaty

<sup>7</sup> Strategic Arms Limitation Treaty

possible to the situation before the US withdrew from the ABM treaty. It would have made no sense for Russia to threaten the ISS programme that contributes to both powers' capabilities. From the US perspective, the aim was to put in place a BMD system without losing any other capability, so they had no interest in threatening the ISS programme.

This case study represents a nuclear balance of power, and in terms of international politics it was – as understood by realist theory – a more important aspect of the US-Russian relationship than was cooperation on the ISS. But a balance of power was achieved that was satisfactory to both sides – cooperation continued because the ISS was not a significant concern to either side, and both wanted to maintain the capability it provided.

## **Case Study II - Iranian Weapons of Mass Destruction**

*“Spend \$40 billion building a big tin can in orbit round the Earth, in order—at least in part—to keep the rocket scientists of your former enemy from going to work for your current enemies. Then find that a law intended to stop the current enemies getting their hands on such rocket scientists' knowledge means you can no longer use this expensive tin can.”* (The Economist, 2005).

The law alluded to in this (rather dismissive) article about the ISS programme by *The Economist* is the Iran Nonproliferation Act (2000). While the first case study involved US action contrary to Russian interests, this case study involves a US response to what it saw as Russian support to an Iranian Weapons of Mass Destruction (WMD) programme – in particular whether it would be forced to withdraw or severely limit its activities on the

ISS. This case study will describe what the Iran Nonproliferation Act is and what it intended to achieve in 2000 and consider the implications for the core argument of this work. Next, a key event in the history of the ISS programme will be introduced and analysed in this context – the loss on re-entry of the Space Shuttle Columbia (flight STS-107) in 2003. Finally, the resolution (amendment to the law in 2005) will be analysed and I will conclude that the actions of the US throughout this case study are in line with the core argument of this work: continued cooperation on the ISS can be understood using the realist framework – it was in the US interests to cooperate on the ISS (see Chapter 1), and so the law was changed.

The US has constructed a legal framework for sanctioning states that they assess are providing Iran (with whom relations have been sour since the 1979 revolution in that country) with technology related to nuclear, chemical, biological or advanced conventional weapons, including ballistic missiles – aimed at sanctioning Russia among others (Squassoni and Smith, 2005, p1). The Iran Nonproliferation Act of 2000 specifically bans the US from making payments<sup>8</sup> to Russia relating to the ISS programme unless the President determines that Russia are taking steps to prevent such proliferation (ibid), except for specific items underway at the time the act was written and to prevent *“imminent loss of life by or grievous injury to individuals aboard the ISS”* (ibid, p3). While this was clearly a challenge to ongoing cooperation on the ISS programme, it was not critical at the time – the US Space Shuttle and the Russian Soyuz provided transport capabilities for astronauts<sup>9</sup>, allowing both partners to concentrate on their own modules

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<sup>8</sup> The bartering system in operation on the ISS (see Chapter 1) would have facilitated cooperation without the need for funds to pass between governments however.

<sup>9</sup> Both the US and Russia, alongside Japan and European countries have cargo-only transfer capabilities as well.

without impacting on each other (the only critical Russian component was on the exception list, *ibid*).

On February 1<sup>st</sup>, 2003, Space Shuttle Columbia was lost as it returned to Earth; resulting in the deaths of all seven crew (Caffrey, 2013). The shuttle fleet was grounded while the investigation was underway – putting construction of the ISS on hold – until 2005 (*ibid*). This left the US with a temporary gap in their capability to send crew to the ISS and new reliance on Russia. This temporary gap was however to become permanent as NASA's 2004 *Vision for Space Exploration* laid out plans to return the Shuttle fleet to flight solely to complete the construction (not the subsequent operation) of the ISS – when it was to be retired (NASA, 2014<sup>10</sup>). A capability gap in human spaceflight was foreseen in the report, but only until 2014. By the time President Obama laid out his vision for space in 2010 he did not give a date for the return of this capability – focusing instead on his expectation of a capability for human spaceflight beyond the moon from 2025 (NASA, 2010) - although a commercial option is expected by 2017 (NASA, 2014b). There are links here with the role of private companies in space which are covered in the next chapter, but for the purposes of this case study the key fact is that, as of 2004 the US would have no human spaceflight capability beyond the construction of the ISS. Combined with the Iran Nonproliferation Act's ban on funding the Russian Space Agency it seems as though the US would not be able to use the space station it had largely funded. And hence the quote from *The Economist* at the start of this section. Interestingly, Russia is not mentioned at all in either the Bush-era *Vision for Space Exploration* or Obama's speech (NASA, 2004

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<sup>10</sup> The report summarises the recommendations before the page numbering starts.

& 2010) – US pride in their space programme clearly pushed them to ignore this uncomfortable truth.

Had this state of affairs been allowed to continue – with the US unable to use the ISS, while Russia enjoyed its unhindered use – then the core argument of this work would be indefensible. The realist tenet that states are unitary actors would have been shown to be a wildly incorrect assumption; the US President and the Congress would be seen as two powers within the US state that were challenging each other in the important capability area of human space flight. The rationality argument would also have been challenged by what would have been a huge gift of capability from the US to one of its main competitors. However, this was not the case. When this threat to the US national interests became apparent, two key things happened. Firstly, NASA started to consider a lot of things as imminent threats to crew safety, thus triggering the crew safety exemption (Squassoni and Smith, 2005, p3). And secondly, the law was amended in 2005 to ensure that the US could in fact purchase places on the Russian Soyuz schedule in order to meet US obligations on the ISS programme (US Government Printing Office, 2005, Sec. 3).

This case study represents a clash of priorities in what was seen as the US national interest. On the one hand, as described in Chapter 1, space capability is a key component of state power and the both the US and Russia had clear incentives to cooperate. On the other the US believed that Russia was aiding the development of the military capability of Iran, viewed as a rogue state. On this specific clash, cooperation on the ISS was seen as more important (note that sanctions on other aspects of the Russian economy were maintained), and it is easy to see why using the realist framework. While Iran was viewed as a threat, the alleged Russian assistance was never going to create the conditions for Iran

to surpass the power of the US and its European allies – and the threat was not imminent, so alternative action could be considered to contain the threat if it turned out that the Russian Space Agency were a key agent in the technological transfer in the areas of concern. The US (or, more broadly, NATO) would still massively overmatch Iran both conventionally and in nuclear terms. If the US had decided to withdraw from the ISS however, they would leave Russia as the only nation with the capability to keep humans in low earth orbit, and to conduct science experiments in microgravity, denting the US claim to be the leading spacefaring nation and challenging US supremacy. Even with the decision to alter the law to allow the US to fund Russian ISS activity, Russia remain to this day<sup>11</sup> the only nation who can transport humans to low earth orbit and keep them there (although China also now have the ability to send humans to their space station for very limited time periods – Xing, 2014).

Chapter 1 outlined the reasons that the US and Russia both considered operating an inhabited space station to be in their national interests, and that the conditions required to overcome the conditions for cooperation were overcome. In this chapter, the first case study showed that Russia was able to balance against what it saw as US aggression without risking the ISS. This case study has shown an example of clashing priorities in the determination of the continuing US national interest, and explained why the ISS programme survived. The final case study will consider the consequences of Russian intervention in Ukraine – a challenging case (war and peace being paramount in the realist framework) but, to date at least, not a deal breaker.

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<sup>11</sup> This work was completed on 14<sup>th</sup> December 2014.



### **Case Study III – 2014 Ukrainian Crisis**

The most severe deteriorations of the US-Russian relationship have been the consequence of military interventions – the primary concern when understanding international relations using the realist framework. Both the US and Russia have conducted military interventions outside the United Nations framework and against each other's wishes, for example the NATO interventions Kosovo and Serbia; the 2003 US-led intervention in Iraq and the 2008 Russian intervention in Georgia. ISS cooperation has continued through each of these. This case study focuses on the ongoing Ukrainian crisis because of its potential to be a turning point. It is interesting because while cooperation is continuing there are serious concerns about whether the life of the ISS will be extended past 2020. It is not threatening current cooperation, so parallels can be drawn with earlier conflicts that did not affect the ISS. But it is threatening future cooperation, which represents – for the first time – evidence that Russia in particular are planning for a future without dependence on the US<sup>12</sup>. In Grieco's terms, both nations may be becoming more sensitive to the barriers to cooperation.

In late November 2013, Ukraine's President Yanukovich withdraw from a trade deal with the European Union (EU), triggering protests in Kiev. While the EU association agreement was the initial trigger for the protests, they quickly developed into anti-regime protests (it had been felt that negotiations with the EU had been constraining the regime from their worst excesses – Wilson, 2014, p67). This led to a change of regime in Ukraine, and Yanukovich fled to Russia aided by his ally Putin (BBC, 2014e). This is

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<sup>12</sup> Although the Russian economy is currently struggling, in part due to Western sanctions (BBC, 2014g)

documented in detail in Wilson (2014, Chapters 3-5), but the focus of this case study is what happened next: Russia claimed Crimea, conflict erupted in the Donbass region of Ukraine (bordering Russia), NATO and Russia increased military preparedness and sanctions were placed on Russia by the EU and US, and then by Russia in retaliation. The conflict did not damage cooperation on the ISS, but the economic sanctions have made future cooperation uncertain.

While Russia maintain that they have not intervened in Ukraine – for example in October 2014 (The Guardian, 2014) – it is on record that Putin was given authority to intervene by the upper house of parliament in Russia (BBC, 2014f). Both NATO (2014b) and the Organisation for Security and Cooperation in Europe (2014) report that Russian troops and heavy weapons are operating in the Donbass region in Eastern Ukraine. Similarly, while Russia and the West disagree on the context, Russia now considers Crimea to be a part of the Russian Federation (Russian News Agency, 2014). Aside from the Black Sea Fleet at Sevastopol, the key strategic location of Crimea serves Russian national interests: it allows Russia to dominate Southern Ukraine and Moldova and leaves Russia and Turkey as the only Black Sea naval powers (Wilson, 2014, p117). Analysis of the conflict in Ukraine is beyond the scope of this work, it is the effects on US-Russian cooperation on the ISS programme that is of interest. The important aspects of the Ukraine crisis are that Russia has revised its borders to include Crimea and that both NATO and the OSCE assess that Russian troops and heavy weaponry are involved in the conflict in the Donbass region of Eastern Ukraine, while Russia is denying this<sup>13</sup>.

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<sup>13</sup> Stories backing up the NATO/OSCE assessment from Russian sources are also available, for example the testimony of Russian soldiers reported in Newsweek (2014).

A key US (and European) response to Russia's actions in Ukraine (in addition to increased military preparedness – see The Guardian, 2014b) has been economic sanctions focused on Russian finance, energy and defence industries. These are targeted at individuals or wider entities and aim to: limit debt financing, prohibit support to oil or gas exploration or production, and restrict supplies to the Russian defence sector (including spacecraft) (Mondaq, 2014). To the disappointment of many in the US space sector, the US State Department has stated that satellites being sent to Russia for launch would be covered by new export controls and would only be allowed if they could be convinced that they are not “contributing to Russia's military capabilities” – with little guidance on how this would be determined (de Selding, 2014b). The concern lies in the necessary discussion of technical aspects of the satellites with the Russian launch providers to allow integration into the rocket and subsequent successful deployment (ibid). While none of these US-imposed sanctions put the ISS at risk, it was at this point that Russia played to its strengths as the only ISS partner that has the capability of getting people to and from the station – with the Russian Deputy Prime Minister Rogozin provocatively stating on Twitter that *"After reviewing the sanctions against our [Russian space industry], [I] suggest [that the] United States deliver their astronauts to the ISS [International Space Station] using a trampoline"* (Kramer, 2014, translation and context hers). It was immediately assessed however that Russia were unlikely to follow through with this threat as their space programme is dependent on the money paid by the US for the Soyuz trips (\$60 million per person) (Baczynska, 2014). The continued cooperation can be understood by looking again at Grieco's barriers to cooperation. With the US relying on the Soyuz, and the Russians dependent on the US funds – there was little risk of either side deciding to withdraw from the ISS at this point. The broad ban on ‘contributing to Russia's military capabilities’ points to an increased sensitivity to the relative power calculations, as could

Russia's ban on the use of its rockets for US military capability (de Carbonnel, 2014). The alternative view that these are short-term tit-for-tat punitive measures rather than serious attacks on each other's long term capabilities requires the passage of time to assess, but it seems unlikely if serious short-term damage to key sectors of each state's economy is likely (as de Selding argues is the case in the US, 2014b). The sensitivity is however in the longer term, and at this point it is cooperation after 2020 – which should be being planned for now - that is at risk of breaking down.

While Rogozin confirmed that the Russians will keep to their obligations and continue to cooperate on the Space Station until 2020, he expressed doubt for any extension and highlighted recent discussions on space capabilities between Russia and China (Russia Today, 2014b). He seemed to scorn Russia's current role in the ISS – “[s]imply circling the earth's orbit and earning something on cosmonaut delivery to space - that's not enough for this great space country” (ibid), adding “*The Russian segment can exist independently from the American one. The U.S. one cannot*” (Bora, 2014) but there were no firm plans and the US is planning on having its own human spaceflight capability around that time anyway (NASA, 2010), removing the key dependency on Russia. A more positive framing of the situation came from Russian Space Agency head of human spaceflight Krasnov, who has stated that NASA are doing everything possible to ensure that present day cooperation is not put at risk and only considers a post-2020 agreement unlikely for the time being (Svitak, 2014). From the US perspective, the head of NASA's human spaceflight programme Gerstenmaier announced a US commitment to the ISS Programme until 2024 and confidently declared that while it could be years before other partners make the commitment, “*if necessary ... NASA will go it alone*” (Achenback, 2014).

In conclusion, Russian dependence on US funding and US dependence on Russian Soyuz places has insulated ISS programme from deteriorating US-Russian relations more generally. This mutual dependence both provides assurances against cheating, and ensures that relative power considerations are manageable – loss of the ISS would represent a loss of capability for both nations. Although it would represent a much greater share of the Russian space capability, it is the Russians who are delaying further agreements, perhaps the intention is to use this in a future negotiation over the status of Ukraine (noting the stated intention of Russia to base some Soyuz training in Crimea, Russian News Agency 2014b), but a focused study of the current conflict would be necessary to draw conclusions on this. This realist-based analysis does however suggest that the conditions expected in the 2020s (a US human spaceflight capability, the option of the Russian compartments operating independently and NASA’s willingness to ‘go it alone’) alongside a continuation of the current deterioration in US-Russian relations would make an extension to ISS cooperation unlikely. Only the acceptance on the Russian side that it could not really afford to go it alone (without the US paying them for use of the Soyuz), with the loss of prestige that would accompany this, would allow continuation to continue.

## **Conclusion**

Chapter 1 provided arguments for why self-interested nation states living in an anarchic world order would desire a space programme, and further, an inhabited space station. Consideration of Grieco’s work on when cooperation should be expected under this realist framework in the optimistic environment of the immediate post-Cold War world provided the understanding for why Russia and the US opted to cooperate on the ISS Programme. This chapter has charted the deterioration of that relationship through three case studies.

While Russia felt threatened by the US plans for Ballistic Missile Defence, it was ultimately able to balance by altering its military doctrine and by developing nuclear warheads with multiple re-entry vehicles to maintain the credibility of their nuclear deterrence. Stopping co-operation on the ISS would have been contrary to their national interest and not have resolved the issues caused by the US plans. Plans in the US congress to prevent further funding to Russia until they changed policy on providing weapons technology to Iran were reviewed when it became clear that after the Columbia Space Shuttle disaster this would put US participation on the ISS at risk, although the law was only changed enough to ensure the continuation of the ISS programme. The most serious threat has come from the ongoing crisis in Ukraine – although mutual dependence as well as recognition of the importance of the ISS has insulated it in the short term. If this trend of deteriorating US-Russia relations continues, continued cooperation after 2020 – when the mutual dependence could be reduced or removed - looks unlikely.

The final chapter will consider challenges to this realist framing, and covers some more optimistic assessments of ISS cooperation. It will, however, also argue that while they add useful insights into our understanding, they are ultimately dependent on successful cooperation between self-interested states in an anarchic world, as understood using the realist framework.

## **Chapter 3 - Challenges to Realist Assumptions**

### **Introduction**

The previous chapters have outlined why both Russia and the US feel they need a space station, why it has had to be an international project, and how it has remained in both country's national interest to continue to cooperate despite worsening relations overall. In doing so, these chapters have presented the evidence behind the core argument - that the development and continued success of the ISS can be explained using the realist framework based around self-interested nation states. But there are other ways of framing the history of the ISS programme that challenge the assumptions underpinning realist theory. In order to strengthen my core argument, I will outline what I consider the three strongest challenges and explain that although these alternative framings can be useful to gain new insights into the ISS programme, there is insufficient evidence to suggest that they undermine realist theory.

The first challenge is the framing of the history of the ISS programme that suggests that, after the end of the Cold War and the success of European integration since the Second World War, the inclusion of Russia into the ISS programme aimed to foster the conditions for a deepening cooperation between Russia and the West. This would be achieved through a process of 'spillover' whereby cooperation on the ISS would mean that it would be in both states interest to co-operate on aspects related to that programme, starting a snowball effect of – to borrow a European Union term – ever closer union. This would challenge the less optimistic realist framework that argues that the possibility of such spillovers are a deterrent to cooperation (Grieco, 1988, p486), but I will argue that this

framing of the history of the ISS programme is wrong. From the agreements signed at the start of this successful cooperation, through the ways of working on the station, I will show that this was not intended. Also, if it was intended or hoped for – the deteriorating US-Russian relationship chronicled in Chapter 2 shows that it failed. The second challenge comes from the view that the ISS programme is an international effort with benefits to the whole of humanity, and that this places it beyond geopolitics. While I accept that aspects of the research being conducted do have altruistic goals, and many of the scientists and engineers involved have little interest in geopolitics, I maintain that the existence of the project depends on it serving key national interests. It is also the case that while the project is international, it is not global. It is international in the narrow sense that it includes multiple nations, but it is not as inclusive as the term can be understood. Key emerging nations such as India and China are not included, neither are majority of Earth's nations. The third and final challenge is to the state-led approach considered so far, arguing that private investment has been a key factor in the history of the ISS. While there has been growing private investment in space launch technology, mainly among the Western contributors, I will show that at least up to now the states have maintained their positions as the key players, using commercial options only where it suits them.

### **Challenge I – Cooperation on the ISS Aimed to Foster Further Cooperation**

Chapter 1 described the good relations between the U.S. and Russia in the Yeltsin/Clinton years that immediately followed the Cold War. Sweet, in her assessment of the Russian space programme noted that *“the Cold War is hailed as being over and a spirit of euphoric co-operation seems to have permeated US policy-making.”* (1998, p135). A coherent argument can therefore be made that in these special circumstances the architects



of the ISS agreements were trying to lock-in cooperation. Alongside the desire that “*the movement toward democratic reform would continue no matter who governs in the Kremlin*” (Friedman, 1993) – perhaps the development of a capability valued equally by the US and Russia would lock-in cooperation in space no matter who was in charge? I will develop this argument with parallels drawn with the theory based on European integration, specifically the concept of spillover in the context of neofunctionalist international relations theory. But I will show that there is insufficient evidence to uphold this challenge, which reinforces the core argument that the history of US-Russian cooperation on the ISS can be understood using the realist framework.

When considering the entirety of global politics, one of the key pieces of evidence counting against the realist theory is the European Union, which includes some supranational elements (e.g. the Parliament, the Commission and the Court of Justice), which is at odds with the anarchic inter-state relationships that form the basis of realism. From a union of 6 nations in a coal and steel agreement after the Second World War (Hefferenan, 2001, p27), the project has expanded to include 28 member states who have agreed to pool and share elements of their sovereignty (ibid, p41). In an effort to develop a theory of international relations that can help to understand this, the neofunctionalist theory was developed by Haas, among others (Eilstrup-Sangiovanni, 2006, p90). At the core of this theory was the concept of *spillover* –states cooperating on one area realise that another area is inextricably linked, and therefore they widen the scope of their cooperation (ibid). This contrasts starkly with realism where such links, in creating ever greater scope for the proposed cooperation, is likely to deter states from cooperating (Grieco, 1988, p506). Focusing again on the topic of this work, if there was evidence that such spillover was intended or achieved then its core argument - that the realist framework is sufficient to

understand the history of the ISS – would be challenged. The concept of spillover incorporates three distinct types: functional, political and cultivated. Each will be considered in turn in relation to US-Russian cooperation on the ISS programme.

Functional spillover is based on cooperation in one sector of the economy (or, more broadly, state activity) causing problems that can only be resolved by those involved choosing to cooperate in another – for example removing tariff barriers may disadvantage some states and lead to a need for redistributive tax policies (Eilstrup-Sangiovanni, 2006, p94). In terms of the ISS programme, the related sectors of state activity are other civilian use of space, military uses of space and dual-use space-launch/missile technology (see Chapter 1). There are US companies that use Russian rockets to get satellites into space (the ones threatened by their inclusion in sanctions in the Ukraine case study in the previous chapter), but this is not due to any problems caused by cooperation on the ISS and there is nothing to suggest that these partnerships would not have been made without cooperation on the ISS. When it comes to the military and dual uses of space technology, the case studies of the previous chapter all show evidence that especially as the US-Russian relationship declined such cooperation became less likely. Rather than expecting spillover into these areas, the challenge has been to isolate cooperation on the ISS from them. Following Grieco's assessment of issue linkages deterring cooperation, it is quite possible that had US and Russian leaders in the early 90's predicted the history outlined in Chapter 2 they may never have agreed to cooperate.

Political spillover occurs when groups within societies start to believe that their interests cannot be served only by their own state, and they therefore start trying to influence centres of power above state level – for example political parties organising at the

European level (Eilstrup-Sangiovanni, 2006, p94). The final type, cultivated spillover, occurs when a supranational body aims to foster wider cooperation between its members, for example with the use of side-payments (ibid). Both of these types of spillover require a non-state entity to cultivate cooperation or be lobbied by interest groups. There are undoubtedly examples of this within the European Space Agency (ESA), which while intergovernmental (rather than supranational) is considered a single partner in the ISS programme, but this is outside the scope of this work which focuses on the US-Russian relationship and here there is no such entity. The ISS programme is, as explained in Chapter 1, rigorously intergovernmental in character (see ESA, 2014 for a summary) – in fact it does not even have its own website (each space agency has its own ISS pages). Even the station itself is segregated by partner, with a distinct Russian area (clearly seen on the ‘ISS Tour’ video, Huffington Post, 2010, 2:35).

So in conclusion I have found no evidence of any of the types of spillover that Eilstrup-Sangiovanni described in the context of European integration, either intended in the setting up of the ISS agreement and design of the space station itself or experienced so far. In fact, the opposite is true – the ISS was set up to maintain national ownership and responsibility of each module (noting again the European exception), and efforts since the programme started have focused on keeping it insulated from other aspects of inter-state relations.

## **Challenge II – Cooperation on the ISS is an International Project for Humanity**

*“The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.”*

Extract from Article I of the Outer Space Treaty (1967)

It is the core argument of this work that there is nothing unique about space that puts it beyond geopolitics, which is a pessimistic message compared to the extract from the Outer Space Treaty – signed by both the US and Russia – above. This section will consider the history of the ISS programme as a project for humanity. A critical analysis will follow to highlight the primary nature<sup>14</sup> of the realist framework focussing around: the limited definition of ‘international’, the emerging Chinese competition after they were not allowed to join; and the distinction between the inter-state logic that drives the programme and the dreams of science and exploration by those who can take advantage of it.

At a press conference before their trip to the ISS, a joint US-Russian-German crew were asked whether political tensions would affect their mission – instead of replying they got up and hugged each other (Russia Today, 2014). The message was clear and I do not doubt their sincerity. Even in the most challenging of the case studies, the head of human space flight at the Russian space agency recognised that personnel at NASA were doing "everything they [could] to make sure politics do not affect our ability to work together" (Svitak, 2014). Sweet’s assessment of the motives of Russian scientists and engineers

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<sup>14</sup> I will reflect on these findings in the conclusion, but note that describing realist theory as primary I do not claim that other perspectives are not also important. States may be best modelled as selfish (relative) power-maximisers, that does not mean people should be too.

(and, I do not doubt this would cover the US equivalents also) working on their country's space programme makes clear the multiple goals: "*a desire to excel for science's sake alone, a desire to compete commercially, and a desire to achieve military superiority in space*" (Sweet, 1998, p138). Individuals within each country will be driven by some combination of these aspects. The segregation of the ISS into modules for different partners has already been covered – but the scope of cooperation falls short if this is to be considered a project for all humanity. Brazil's inability to complete a proposed addition to the Space Station has led them to being excluded, with a Brazilian astronaut taken out of training and not allowed to travel to the ISS (Sadeh, 2013, pp18-19). US concerns over the dual-use nature of rocket technology have led it to block Chinese membership of the ISS programme (Rhian, 2011), even going to extent of banning Chinese nationals from attending academic conferences on national security grounds (Sample, 2013). The result of this is that cooperation on the ISS Programme is between wealthy states in the 'global north'.

Further to this, China have continued toward their goals despite rejection from the ISS programme. After successfully launching their Tiangong-1 space station in 2011, and inhabiting it for a short time, it is planning a larger (although still much smaller than the ISS) station between 2020 and 2024 (Xing, 2014, p13). China are also inviting foreign astronauts onto their programme and say that other nation's spacecraft will be able to dock there (Space Daily, 2013). If the ISS continues into the timeframe, there could be two competing international space stations. The director of the United Nations Office for Outer Space Affairs has stated that she is convinced that China are committed to peaceful use of space (ibid) – and the ISS programme has also been committed to this – but there are examples to the contrary involving all three major spacefaring nations. China have

reportedly tested an anti-satellite weapon (BBC, 2007); the Russians are accused of operating an anti-satellite satellite (Griffen, 2014) and the US are accused of using their X-37B (similar to a small remotely piloted space shuttle) to spy on China (BBC, 2014c). Perhaps this is the realm of conspiracy theorists, but one thing that is known is that none are being transparent about their intentions on these missions. None of this is to downplay the significance on the international cooperation achieved on the ISS programme, or the intentions of those involved to live up to the optimism of the Outer Space Treaty. But, it is the case that the ISS programme involves cooperation between wealthy northern states and both opportunities to extend membership to countries considered to be in the ‘global south’ have failed.

So, cooperation on the ISS has multiple levels – at the inter-state level, geopolitics understood using the realist framework is key. At the level of individuals, commitments to science or exploration are found. A conference that excluded Chinese nationals faced a boycott from some in the scientific community which resulted in a ‘clarification’ and a reversal (Sample, 2013b) – showing that the realist, geopolitical level is not all-powerful. The history of the ISS programme does support the argument that it is best understood with primacy given to the realist framework however, which is a view consistent with that of Gilpin:

*“[I]ndividuals and groups may seek truth, beauty, and justice, [but] all these more noble goals will be lost unless one makes provision for one’s security in the power struggle among groups”* (quoted in Grieco, 1998, p498)

### **Challenge III – The ISS is Increasingly a Private Sector Project**

The final challenge to consider relates to the role of the private sector in developing the capabilities required for the success of the ISS. Does this break the realist assumption that states are the primary actors? After briefly outlining the contributions of the private sector I will show that although they are extensive (and growing) they are subservient to the national space agencies who have the responsibilities for space capability – including the ISS programme - delegated from the state leadership. There is no evidence therefore that the realist framework is challenged.

After the Russian Deputy Prime Minister's tweet suggesting that the US should deliver astronauts to the ISS using a trampoline in response to sanctions (see Chapter 2), a response came from Elon Musk, founder of private spaceflight company SpaceX - *"Sounds like this might be a good time to unveil the new Dragon Mk 2 spaceship that @SpaceX has been working on w @NASA. No trampoline needed"* (Kramer, 2014). The involvement of private companies in the development of space capability is nothing new, for example ESA (2014b) lists the contractors used in the development of the European elements. The big change is that companies like SpaceX are developing their own capabilities to launch their own spacecraft with the aim of selling use of that capability to other private companies and potentially space tourists as well as national space agencies. SpaceX's claim to significance is that it is the only private company to return a spacecraft from low earth orbit, first in 2010, and then to deliver cargo to and from the ISS (SpaceX, 2014). Boeing and SpaceX were awarded the contracts for the Commercial Crew Transportation Capability by NASA in September 2014, who aim to use commercial

options to end the reliance on Russia by 2017 (NASA, 2014b). This will be delayed however, as a third company – Sierra Nevada, have filed a protest (NASA, 2014c).

This represents a direct challenge to the realist framework, in particular that states are the primary actor in international relations. There are a number of reasons why this is incorrect however. Firstly, any challenge would be in the future while the core argument of this work is necessarily based on the history of the ISS. Secondly, there is no suggestion that private companies are on the verge of adding to the ISS or creating an inhabited space station of their own – it is for transport to and from low earth orbit that commercial options are being sought. Thirdly, NASA are leading the competition and through the ISS agreement they are the key gateway to the ISS. Fourthly, it is only American companies that are supporting NASA (although Sierra Nevada have made reference to working with foreign space agencies – see Amos, 2014). Fifthly, the reason NASA is looking to commercial options is so that they can concentrate on deep space missions, including to Mars (NASA, 2014b). The commercial providers will not be challenging the state for primacy, they will be consolidating gains made by states as those states take on the challenges that will define inter-state competition in the future. Low-earth orbit is not to mistaken a low-risk, routine activity however. In the time taken to complete this work an Orbital Sciences cargo shipment to the ISS failed (NASA, 2014), and Michael Alsbury lost his life when the Virgin Galactic space plane he was testing malfunctioned and was destroyed (2014).

## **Conclusion**

The first two chapters outlined the supporting arguments behind the core argument of this work – that the development and continued success of the ISS can be explained using the



realist framework based around self-interested nation states. This final chapter has introduced the three main challenges to this view, and explained why I have rejected them. In doing so, other important findings have come to the fore. Although states are the primary actors in ISS operations, significant plans are underway in the US for incorporating commercial options which could become significant in future. And although the history of the ISS does not support the view that space exploration and science are beyond geopolitical interstate rivalry, there is nothing to suggest that the people involved in the project are affected by this during day-to-day operations. From the perspective of those on the ISS – when you view the Earth from space, there are no borders. But from the perspective of governments who sponsor the ISS programme, the borders are all too visible.

## **Conclusion**

The core argument throughout this work is that the development and continued success of the ISS can be explained using the realist framework based around self-interested nation states. The first chapter began with some quite abstract discussion over theories of international relations, clarifying the difference between normative & descriptive, and realist & idealist theories. It located this work within the realist and descriptive camps – while offering a critique of the ‘realist’ label as used in the academic field of international relations. What followed was a summary of realist theory applied to the specific case of the ISS programme, and with a particular focus on Grieco’s ideas on the conditions for cooperation in realist theory. Consideration was given to why a space station is considered to be in the national interest of top-tier states at this point in history, and the reasons why the US and Russia did not develop a national capability, opting for cooperation to achieve their goals.

Chapter 2 considered three case studies that highlighted the deterioration of US-Russian relations. Russia’s balancing to a perceived threat from US Ballistic Missile Defence was possible without threatening ISS cooperation, which would not have been in Russian interests and would not have resolved their perceived issues. When US non-proliferation laws conflicted with the ability to operate the ISS (given the grounding of the US Space Shuttle fleet after the Columbia disaster in 2003), the law was changed very specifically to make an exception to the ISS – specifically the ability to buy Soyuz places from Russia despite suspicion that Russia was illegally exporting sensitive technology to (from the US perspective) rogue states. The greatest challenge to cooperation is the result of sanctions following Russian annexation of Crimea and alleged support of separatists in the Donbass

on the Ukraine-Russian border – but both the US and Russia are currently locked into cooperation. The US can only use the ISS if Russia allows it to use the Soyuz capability to transport its astronauts. In return, the \$60 million per place that Russia receives for this service is vital to its space programme's funding. As a result of this, the challenge is in the future, when a US human spaceflight capability is expected. It is Russia however who have put on hold any agreement to extend the life of the ISS past 2020.

The final chapter considered some challenges to the underpinning tenets of realism through some alternative framings of this history of the ISS programme. First, it showed that whether functional, political or cultivated spillover is considered, there has been no evidence that cooperation on the ISS was intended to encourage (or had the unintended consequence of encouraging) wider cooperation. In fact the opposite has been the case – efforts to isolate cooperation on the ISS from the very sensitive related fields have dominated. Secondly, while many people involved genuinely consider the work of the ISS to be an international project for the whole of humanity it is a partnership of powerful northern states which have carefully set up the founding agreement to ensure that national boundaries are respected in space. The rejection of China, and their subsequent successes on their way to developing a space station that could also have the label of 'international' highlights this, as does the lack of transparency of the US, Russia and China relating to some of their space activity. Finally, although commercial capabilities are being developed for transport to and from low earth orbit, this has not challenged the primacy of state actors who would still control all but the most routine (relatively speaking) of space related tasks. The assumptions relating to the primacy of the state therefore survive the challenges from these alternative framings.

So, the fact that US-Russian cooperation on the ISS has continued in the context of a deteriorating wider relationship does not therefore indicate that science and the exploration of space are special, immune from geopolitical rivalry. It can be explained using the realist framework based around self-interested nation states. But while the argument of this work is that the realist framework has the primary role in helping to understand cooperation on the ISS, it makes no claims that this is how it always has to be. While it has been beyond the scope of this work, I have referred to the European contribution (as a single European partner) as a potential exception. More research will be needed to investigate this, but the process of European integration (noting that ESA is intergovernmental rather than supranational) may point towards a potential alternative. This would link into a wealth of academic debate in that area.

The point is not that geopolitics as understood by realist theory is somehow the natural order, unchanging and unchangeable. My interpretation is more optimistic. It is that if multinational science and space exploration are to develop in the future it will not be because of a romantic view of space as insulated from geopolitics, but because advocates will have fought for it. It is essential for advocates to understand the challenges they face and not to be deluded by romantic idealism. Physicist Brian Cox concluded his most recent documentary series with this thought “*[s]o, what are we to do to secure our future? Well, we must learn to value the acquisition of knowledge for its own sake, and not just because it grows our economy or allows us to build better bombs*” (2014, 54:44). The realist theory of international relations – which only values knowledge to the extent that it strengthens state capabilities - will continue to constrain cooperation in space, as in any other field, for as long as we fail to follow this advice.

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