Collaboration around the International Space Station: science for diplomacy and its implication for U.S.-Russia and China relations

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Executive summary

The recent years have seen a post-cold war all time low in United States and Russia diplomatic relations, with the U.S. (and Europe) using stern economic sanctions over Russia's involvement in Crimea and Syria. While those tensions have resulted in some initial controversial statements and threats about the two countries' collaboration around space exploration, the two major agencies, NASA and Roscosmos, have not only recently agreed to collaborate until 2024 on the International Space Station (ISS), but have also announced plans for a new ISS 2.0 and further collaboration on Mars exploration. How can the two conflicting policies be reconciled, and how does space collaboration participate to the maintenance of strong diplomatic ties? What lessons can be drawn from the U.S.-Russia diplomatic relations around the ISS, especially with regards to US-China relations? It will be argued that the longstanding ISS collaboration between the U.S. and Russia has led to the creation of solid ties between the two agencies and locked their respective scientists in an interdependent, collaborative relationship to the point of becoming an anchor point amid geopolitical tensions. Using historical, Wikileaks documents and recent statements, it will be shown that scientific collaboration participates in creating stable, lasting ties through track II science diplomacy, across borders and political divides. It will therefore be recommended that, to further harness the power of space diplomacy, the U.S. should seek to engage China and Asian countries in its future space endeavors.

1. **The growing club of spacefaring nations and the increasing need for space diplomacy**

The club of the spacefaring nations, the ones that are active in space and capable of launching and operating spacecrafts, is usually thought to be a select one: only fourteen nations in the world so far have been able to do so[1]. However, space is becoming increasingly accessible and the recent years have seen a few unlikely players join the club, such as Iran in 2009 (which sent Saudi Arabia and Turkey scrambling to invest more heavily in space technology[2]). The Democratic People's Republic of Korea and South Korea followed shortly after, joining in 2012 and 2013 respectively. Over ten years (2003-2013), the number of countries investing between $10 to $100 million in space technology tripled (from 10 to 30) and in 2014 the number grew to an estimated 52 countries[3].

Historical spacefaring nations such as China and India have also increasingly invested into their space program. With China's first human spaceflight mission launched in 2003 and its first space station put in orbit in 2011, the two emerging leaders started an "Asian space race"[4]. India since launched its lunar orbiter, *Chandrayaan I*, in 2008 as well as placed its first ever deep-space probe in orbit around Mars in September 2014. Both countries have engaged in multilateral collaborations, fighting for diplomatic soft power dominance in the Asia-Pacific region: while China led the way in forming the Asia-Pacific Space Cooperation Organization (APSCO) in 2008[5], the Modi government announced that it would provide its positioning satellites information[6] to the South Asian Association for Regional Cooperation (SAARC) countries[7] in 2016, a "*gift from India*"[8].

With the global space economy valued at $323 billion and an annual growth of 4%, the private space industry is developing quickly and is now in position to seriously disrupt a once nation-dominated market. In 2015, it already accounted for nearly three quarter of the growth[9]. The

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[1] The spacefaring nations, by launch date, are the Soviet Union (1957), the United States (1958), France (1965), Japan (1970), China (1970), United Kingdom (1971), India (1980), Israel (1988), Ukraine (1991), Russia (1992), Iran (2009), the Democratic People's Republic of Korea (2012) and South Korea (2013)

[2] James Clay Moltz, "Twenty-First-Century Space Security: Conflict or Collaboration?," *Current History* 114, no. 768 (January 2015): 16–22.

[3] Marsha Freeman, "*New Spacefaring Nations Prepare Next Generation To Explore the Universe*", October 2014, 65th International Astronautical Congress, http://media.wix.com/ugd/789864_de324257e60b44cb8d6d25f7f13b657a.pdf

[4] James Moltz, *Crowded Orbits: Conflict and Cooperation in Space* (Columbia University Press, 2014).

[5] APSCO member-states consist of Bangladesh, Iran, Mongolia, Pakistan, Peru, Thailand and Turkey

[6] K.S. Harikrishnan, "*India's positioning satellite to serve South Asia*", March 25, 2015, http://www.scidev.net/south-asia/governance/news/india-s-positioning-satellite-to-serve-south-asia.html

[7] SAARC members-states are Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka

[8] Nalaka Gunawardene, "*South Asia Analysis: Space diplomacy can boost development*", March 23, 2014, http://www.scidev.net/south-asia/enterprise/analysis-blog/south-asia-analysis-space-diplomacy-can-boost-development.html

[9] "*The Space Report 2016, the Authoritative Guide to Global Space Activity*", Space Foundation, 2016, https://www.spacefoundation.org/sites/default/files/downloads/The_Space_Report_2016_OVERVIEW.pdf

technological leaps in cost cutting private launchers (e.g. SpaceX, Orbital Sciences), the miniaturization of satellites (CubeSats) and the possibility of launching them cost-free as secondary payloads as well as the development of commercial human spaceflight ("space tourism") will therefore be significantly contributing to the democratization – and crowding – of space over the next few years. While the number of operational satellites in orbit in 2013 averaged around 1000, this figure could be well over 2000 by 2020[10].

With the orbits getting increasingly crowded and the risk of space debris getting out of control, a few recent events (such as the destruction of a Chinese satellite in 2007 which sent the U.S.-China relationship around space spiraling down, seriously curtailing chances of civil space cooperation[11], or the collision between an Iridium telecommunications satellite and a defunct Russian military satellite in 2009) have highlighted the risks surrounding space exploration, its increasing political importance and hence the need for better diplomacy. Indeed, space debris constitute a serious risk for space exploration with potentially irreversible consequences through the creation of a debris belt preventing humankind to further launch or operate spacecrafts, known as the Kessler effect[12]. For this reason, outer space is usually referred to as the ultimate "global commons"[13]. On June 28th, 2011 space debris passed within 1,100 feet of the ISS, forcing the crew to enter the Soyuz escape module in preparation for a possible strike[14], a scenario not unlike the one depicted in the recent Hollywood blockbuster movie "Gravity" (2013)[15,16]. It is therefore important to learn from the successful and long-lasting historical examples of space collaboration.

Leaving aside the typical problems around financing and delays typical of space projects[17], the International Space Station (ISS) remains a prominent example of successful international collaboration[18] that brought together previously distrustful nations[19], making it a great example

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[10] James Moltz, *Crowded Orbits: Conflict and Cooperation in Space* (Columbia University Press, 2014), 173.

[11] Wikileaks, June 24, 2008 https://wikileaks.org/plusd/cables/08STATE67989_a.html

[12] Donald J. Kessler and Burton G. Cour-Palais, "Collision Frequency of Artificial Satellites: The Creation of a Debris Belt," *Journal of Geophysical Research* 83, no. A6 (1978): 2637, doi:10.1029/JA083iA06p02637.

[13] "*New frontiers in science diplomacy, Navigating the changing balance of power*", The Royal Society & the American Association for the Advancement of Science, 2010, https://royalsociety.org/~/media/Royal_Society_Content/policy/publications/2010/4294969468.pdf

[14] "*Extending the Operational Life of the International Space Station Until 2024*", NASA Audit Report, 18 September 2014, https://oig.nasa.gov/audits/reports/FY14/IG-14-031.pdf

[15] Alfonso Cuarón, *Gravity*, Sci-Fi, Thriller, (2013), http://www.imdb.com/title/tt0064639/.

[16] It is interesting to note that the Director of the movie *Gravity* "watched over and over as a kid" the 1969 movie "Marooned", referred to later in this paper: "Why Gravity Director Alfonso Cuarón Will Never Make a Space Movie Again", October 2013, http://www.wired.com/2013/10/center_of_gravity/

[17] It has been estimated that only 12% of NASA's missions on schedule and that 40% cost more than anticipated. The development of the James Webb Space Telescope is one striking recent example of a mission going significantly over budget: *Controlling Cost Growth of NASA Earth and Space Science Missions* (Washington, D.C.: National Academies Press, 2010), 29, http://www.nap.edu/catalog/12946.

[18] "*Trouble on the Final Frontier*", Andrew Lawler, *Science*, New Series, Vol. 324, No. 5923 (Apr. 3, 2009), pp. 34-35, *Controlling Cost Growth of NASA Earth and Space Science Missions* (Washington, D.C.: National Academies Press, 2010), 29, http://www.nap.edu/catalog/12946.

of science for diplomacy – or more specifically, space exploration for diplomacy. November 2nd, 2015 marked the 15th anniversary of the first international crew to reach the ISS, the year 2017 will mark the 50th anniversary of the Outer Space Treaty of 1967 and 2018 the 1st United Nations Conference on the Exploration and Peaceful Uses of Outer Space[20] as well as the 20th anniversary of ISS's first launch. There is therefore a growing need to further understand space diplomacy and how collaborating in space can help foster stable and long-lasting diplomatic relationships. What can be learnt from the historic Space Race? How did diplomacy help the two diametrically opposed superpowers to collaborate in space and eventually become partners in the ISS? What kind of diplomacy (traditional, public, science, track II) was used? In this exploration of the diplomacy surrounding ISS, it will be shown that diplomatic theory, history and practice are intertwined.

2. **The historical Space Race: a narrowly missed collaboration**

After the end of World War II, the two superpowers, the U.S.A. and the U.S.S.R., started competing for the high ground and dominance over space. The Space Race, as it was dubbed, has essentially been seen a weapons' race, mostly confrontational, the geopolitical context at the time being the driver of the two superpowers' lack of cooperation around space. After all, rockets could be used to launch satellites or humans into space, but they were also the successors of the German V-2 and consequently intercontinental ballistic missiles (ICBMs) capable of carrying nuclear warheads over vast distances. Of course, it has also been argued that the Space Race was more of a question of national prestige between two very different ideologies, as showing technological feats would establish the superiority of one over the other. In the context of the International Geophysical Year (1957), the International Council for Science had recommended the development of satellites to improve the scientific understanding of the upper Earth atmosphere, and sent both superpowers subsequently racing to launch satellites in orbit. Even though the U.S. had the capabilities at the time[21], the U.S.S.R. would eventually be the first nation in history to launch a satellite, Sputnik, on October 4th, 1957, allegedly triggering the start of the "Space Race". The landing of the American Apollo 11 mission on the Moon on July 20th, 1969 is said to have ended it; the era in between those two events a unilateral show of force and dominance with space as its world stage.

While this perception is certainly true in many aspects, it is simplistic to transpose the greater underlying geopolitical conflict directly onto the realm of space exploration. It would indeed be detracting from the fact that collaboration was primarily sought. Science diplomacy around space exploration advocated a desire for collaboration rather than competition and ran on a parallel track, while confrontations were ongoing in various theaters around the globe (Cuba, Berlin, etc.). In his inaugural address in 1961, President Kennedy had alluded to it, saying that both sides should "*seek to invoke the wonders of science instead of its terrors. Together let us explore the*

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[19] Moltz, *Crowded Orbits*.

[20] "UNISPACE Conferences," accessed October 19, 2016, http://www.unoosa.org/oosa/en/aboutus/history/unispace.html

[21] Berkman, Paul Arthur. "International Spaces Promote Peace." *Nature* 462 (November 2009): 412–13. doi:10.1038/462412a.

stars […]"[22]. In his address at the 18th U.N. General Assembly, on September 20th, 1963, approximately a year after the Cuban missile crisis and only a few months after his "*Ich bin ein Berliner*" speech, Kennedy once again suggested a possible joint American-Soviet mission to the Moon: "*In a field where the United States and the Soviet Union have a special capacity – in the field of space – there is room for new cooperation, for further joint efforts in the regulation and exploration of space. I include among these possibilities, a joint expedition to the Moon. […] Surely we should explore whether the scientists and astronauts of our two countries […] cannot work together in the conquest of space"*[23]. While the Soviets had initially rejected the proposal for fear that it would give the U.S. military an opportunity to learn too much about the U.S.S.R.'s rockets and missiles program, Sergei Khrushchev, the son of Soviet Premier Nikita Khrushchev (now a Senior Fellow at the Watson Institute for International Studies at Brown University[24]), said that his father had had second thoughts and had actually been contemplating answering positively to the American offer[25], up until Kennedy's assassination. The desire to collaborate was therefore underpinning the Space Race, even in a strongly bipolar and confrontational world. This is not necessarily surprising. For Harold Nicolson, good diplomacy – and in this context good space diplomacy – "*seeks conciliation and exchange of interests to prevent major conflicts between sovereign states*"[26], and both superpowers had a common interest in space exploration.

3. **Public and track II diplomacy breakthroughs around space exploration**

After the initial Moon landing, the two nations concentrated on building space stations in Earth orbit (Salyut for the U.S.S.R. and Skylab for the U.S.). In May 1972, President Richard M. Nixon and Soviet Premier Leonid Brezhnev signed an agreement to conduct the first joint U.S.-Soviet space flight, the Apollo-Soyuz Test Project (ASTP). The ASTP was a turning point in the U.S.-Soviet space collaboration. The rendezvous, which required an intimate partnership to design a docking mechanism between the two fundamentally different spacecraft's, took place on July 17, 1975. About 40 years ago, Commanders Thomas P. Safford and Aleksei Leonov succesfully docked the Apollo and Soyuz spacecrafts together in low-Earth orbit and reached out to shake hands, making history with the first international handshake in space. Both then exchanged the gift of their respective flags and ate together[27] in acts that could be perceived as staged public diplomacy, as a global audience watched events unfold on television. In his address to the U.S.-Soviet crew, Soviet Premier Leonid Brezhnev had undeniable foresight as he commented that the successful docking "*had confirmed the correctness of the technical decisions developed and realized by means of cooperative friendship between the Soviet and American*

[22] "John F. Kennedy Quotations", John F. Kennedy Presidential Library & Museum, http://www.jfklibrary.org/Research/Research-Aids/Ready-Reference/JFK-Quotations/Inaugural-Address.aspx.

[23] "*Address at 18th U.N. General Assembly, 20 September 1963*", John F. Kennedy Presidential Library & Museum, http://www.jfklibrary.org/Asset-Viewer/Archives/JFKPOF-046-041.aspx.

[24] http://watson.brown.edu/about/history/

[25] Frank Sietzen, "*Soviets Planned to Accept JFK's Joint Lunar Mission Offer*", Space Daily, October 2, 1997, http://www.spacedaily.com/news/russia-97h.html

[26] Harold George Nicolson, *The Evolution of Diplomatic Method: The Chichele Lectures Delivered at Oxford, November, 1953* (Praeger Pub Text, 1954).

[27] "*Apollo Soyuz Test Project Air-To-Ground Voice Transcription*", NASA History Program Office, p.267, http://history.nasa.gov/astp/documents/ASTP-20TEC-2.pdf

scientists, designers and cosmonauts. One can say that the Soyuz Apollo is a forerunner of future international orbital stations"[28]. Noting the importance of such an event of "*cooperative friendship"* in the diplomatic sphere, U.N. Secretary General Kurt Waldheim also congratulated the astronauts for the Apollo-Soyuz Test Project[29].

Most interesting, however, is the alleged origin of the ASTP, according to the 1976 Staff Report from the Committee on Aeronautical and Space Sciences of the United States Senate[30]. While touring the Soviet Union in 1969, Apollo 8 astronaut Frank Bormann would have originally pitched the idea of a joint spaceflight to Soviet cosmonaut German Titov and Dr. Boris Petrov, Chairman of the Soviet Academy of Sciences Committee on Manned Flight. Apparently, Dr. Philip Handler, then President of the National Academy of Sciences, followed suit and convinced his Soviet counterparts on the necessity of designing a common international docking mechanism for the safety of astronauts in orbit by telling them the plot of the Hollywood movie "Marooned"[31] he had recently watched. The movie, a blockbuster starring Gregory Peck, portrayed the rescue of American astronauts stranded in orbit by Soviet cosmonauts. The idea gained ground and evolved into informal discussions in New York between NASA Administrator Dr. Thomas O. Paine and Soviet Academician Blagonravov. These eventually bottomed up to formal discussions in late 1970 and 1971 and were finally signed into formal bilateral agreements in 1972 by the two presidents.

This is a fascinating example of track II diplomacy[32], where informal diplomatic contacts by astronauts and scientists led to the first U.S.-Soviet collaboration in space, paving the way to a significant milestone which was only then used by the two governments as public diplomacy. Obviously, many of the events that history sets in stone as top-down events led by political leaders are in fact much more intricate, and the influence of a tight-knit community such as the one of space scientists or astronauts is not to be underestimated, nor is the influence of cultural diplomacy (here through the American movie industry). While Paul Sharp states that diplomacy happens where *"groups feel separate from one another and want to be so*"[33], it could be argued that communities that are originally seen as separate because of their different nationalities (and political views), but do not necessarily want to be separate because of a common goal, have a role to play in transcending these apparent differences: these transnational epistemic communities therefore play a critical role in Track II diplomacy. In this particular instance, the

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[28] "*SP-4209 The Partnership: A History of the Apollo-Soyuz Test Project*", NASA History Program Office, http://history.nasa.gov/SP-4209/ch11-3.htm

[29] "*The Space Race Speeches & Audio: U.S. and Soviets Link Up in Space*", 2 min video archive, http://www.history.com/topics/space-race/speeches/us-and-soviets-link-up-in-space

[30] "*Soviet Space Programs,1971-75*", Staff Report, Committee On Aeronautical And Space Sciences United States Senate, 1976, p.100 https://ia801700.us.archive.org/22/items/sprogr00libr/sprogr00libr.pdf

[31] John Sturges, *Marooned*, Adventure, Drama, Sci-Fi, (1969), http://www.imdb.com/title/tt0064639/.

[32] Taking the definition that track II diplomacy is "non-governmental, informal and unofficial contacts and activities between private citizens or groups of individuals, sometimes called 'non-state actors": Wikipedia contributors, "*Track II diplomacy*", Wikipedia, The Free Encyclopedia, https://en.wikipedia.org/wiki/Track_II_diplomacy, (accessed December 3, 2004)

[33] Pauline Kerr and Geoffrey Wiseman, eds., *Diplomacy in a Globalizing World: Theories and Practices* (New York: Oxford University Press, U.S., 2013), 51.

idea pitched by scientists sharing a common goal eventually improved international relations between the two countries[34], even if temporarily, in an act of science for diplomacy. This is not, by far, the only example of such an occurrence during the Cold War period. Scientists have been known for preventing military escalation around space as early as 1958[35] or later facilitating communication between Presidents Reagan and Gorbachev[36]. It has also been argued that American scientists, or even private citizens, have actively participated in the negotiations around the Antarctic Treaty of 1959, the Partial Test Ban Treaty of 1963 and the Strategic Arms Limitation Treaty (SALT I) of 1972[37].

While geopolitical tensions between the two superpowers were extremely high during the Cold War, history therefore shows that the U.S.S.R. and the U.S. nevertheless constantly tried to find avenues to collaborate around space issues, both from a "high politics" (e.g. SALT I, Outer Space treaties) and "low politics" (e.g. scientific partnerships) aspect. It is nonetheless interesting to note that the two levels of politics can be intimately intertwined in the collaboration around space. This historical information is invaluable when looking at the 21st century space diplomacy and current state of affairs.

4. The birth of ISS through foreign policy

After years of parallel (and redundant) efforts from the U.S. and the U.S.S.R. to launch and operate space stations (the American Skylab orbited the Earth from 1973 to 1979 and the Soviet Salyut from 1971 to 1986), the Russians eventually dominated the high grounds with the "Mir" Station, which they operated from 1986 to 2001. The 1984 U.S. plans to build a new space station, "Freedom", were marred by crippling overruns and even the later addition of Canada, Japan and 11 European nations to the collaboration in 1988 could not save the project.

By 1991 the rapid "collapse" of the Soviet Union had taken place under President George H.W. Bush's term in office. President Bush used space collaboration as a foreign policy tool: with the faltering Russian economy, it provided avenues for employment to Russian scientists and engineers to work on non-military projects in the interest of the U.S., while simultaneously preventing a potentially dangerous brain drain to Third World dictatorships eager to get their hands on sensitive technologies[38]. In 1993 the Clinton administration redesigned the original "Freedom" project into what was to later become the International Space Station and eventually

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[34] "*New frontiers in science diplomacy, Navigating the changing balance of power*", The Royal Society & the American Association for the Advancement of Science, 2010

[35] Moltz, *Crowded Orbits*, 37.

[36] Frank von Hippel, "Gorbachev's Unofficial Arms-Control Advisers," *Physics Today* 66, no. 9 (September 1, 2013): 41–47, doi:10.1063/PT.3.2116.

[37] Audra Wolfe, "When Scientists Do What Diplomats Can't: The scientific world's quiet influence over foreign policy", The Atlantic, September 26, 2015, http://www.theatlantic.com/science/archive/2015/09/science-diplomacy/407455/

[38] "U.S.-Russian Cooperation in Human Space Flight Assessing the Impacts", Space Policy Institute, John M. Logsdon, James R. Millar Editors, February 2001, http://www.nasa.gov/externalflash/iss-lessons-learned/docs/partners_us_russia.pdf

invited Russia to become a partner in ISS. As noted in 2001 by John M. Logsdon, former Director of the Space Policy Institute, one notable impact of the U.S.-Russian collaboration around ISS has been the transition of the Russian space sector from military to civilian control, as well as its opening to the world market and compliance with export control and non-proliferation[39], a goal of the U.S. foreign policy and hence an apparent top-down diplomatic approach.

However, once again track II diplomacy might have played a critical role. One of the most influential individual credited with fostering the U.S.-Russia partnership is Roald Sagdeev. A plasma physicist, former Director of the Space Research Institute of the U.S.S.R. Academy of Sciences and science and arms control advisor to Mikhail Gorbachev, Sagdeev emigrated in the early 1990's to the U.S. after he met and married Susan Eisenhower (President Dwight D. Eisenhower's granddaughter). He later became a Professor of Physics at the University of Maryland, College Park. Influential in the high spheres of government and famous for having written that "*in the post-cold-war world, space policy is foreign policy*"[40], it is not too far-fetched to think that he and other scientists on both sides therefore played a central role in the accords. While further research might eventually confirm that this is indeed the case, security issues around this potential Soviet rocket scientists brain drain and the subsequent policy decisions will most certainly have been influenced by the recommendations of the military and intelligence services.

The International Space Station eventually launched in 1998. Over the years, it grew to become the most successful and long-lasting international space collaboration in history, with more than fifteen years of continuous human presence in orbit as well as an unrivalled micro-gravity research laboratory. Over the first five to eight years of joint operations, there were no critical political conflicts among the various ISS partners, apart from differing views over the Iraq war wedged by the U.S. and the "coalition of the willing" in 2003. In 2006, tensions over Georgia's breakaway regions and its desire to join the North Atlantic Treaty Organization (NATO), as well as the murder of former Russian security officer Alexander Litvinenko in London threw the relatively stable U.S.-Russia relations onto a slippery slope.

5. Recent strains in the political sphere

Over the last ten years, the U.S.-Russia diplomatic relations have thus been steadily worsening and very recent years (2014-2015) have seen a post-cold war all-time low. The proposed plan of a NATO missile defense system to be installed in Poland and Czech Republic (allegedly to counter potential Iranian and North-Korean missile threats) has been seen by Russia as an intrusion into its sphere of influence[41]. The situation subsequently worsened with the Russia-Georgia war in 2008. Amid the degradation of the Russia-U.S. relations, it is nonetheless interesting to note that the 2008 satellite collision between a defunct Russian military satellite

[39] Ibid.

[40] Ibid.

[41] "Putin: Russia Will Counter U.S. Military Moves - CNN.com," accessed December 7, 2015, http://www.cnn.com/2008/WORLD/europe/02/08/putin.russia/.

and a U.S. commercial telecommunication satellite[42,43] (which could have been a threat to the ISS) was taken as an opportunity to engage in "*bilateral transparency and confidence-building measures*"[44] by the U.S. administration. In 2010, President Obama sought to "*press the reset button*"[45,46], but by 2013 this attempt had been deemed dead, the "*last straw*"[47] being when Russia granted asylum to Edward Snowden, who was then wanted by the U.S. for the National Security Agency documents he had leaked to the press. Since Russia's involvement in Crimea, Ukraine and Syria, the political situation has been extremely tense and volatile. The U.S., and to some lesser extent the European Union (E.U.), have imposed stern economic sanctions over Russia in response.

These new tensions have resulted in some initial controversial statements and threats about the two countries' collaboration around space exploration. In April 2014, Russian Deputy Prime Minister Dmitry Rogozin went as far as using Twitter to say that "*after analyzing the sanctions against our space industry, I suggest that the U.S. bring their astronauts to the International Space Station using a trampoline*"[48], hinting at the fact that since the retirement of the Space Shuttle Program, the U.S. is no longer in the crewed spacefaring nations club and has to rely on Russian Soyuz rockets to deliver payloads and astronauts to the ISS. But were those threats serious? Did they lead to any repercussions onto the U.S.-Russia collaboration around the ISS and space missions in general?

6. Future U.S.-Russian plans to maintain space collaboration

Interestingly, despite the frost increasingly settling in during the last decade, relations around the ISS and joint space missions seem to have progressed relatively unscathed. While it could be easily thought that the U.S. and Russia are simply bound by the Space Station Intergovernmental Agreement (I.G.A., the 1998 international treaty signed by the 15 member countries involved in the ISS) – which has been described in the press as a "*reluctant co-dependency*"[49] – the argument appears to be too simplistic.

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[42] Becky Iannotta & Tariq Malik, "U.S. Satellite Destroyed in Space Collision", February 11, 2009, http://www.space.com/5542-satellite-destroyed-space-collision.html

[43] Brian Weeden, "2009 Iridium-Cosmos Collision Fact Sheet", Secure World Foundation, November 10, 2010, http://swfound.org/media/6575/swf_iridium_cosmos_collision_fact_sheet_updated_2012.pdf

[44] "U.S. And Russian Comm Satellite Collision", Wikileaks, February 12, 2009, https://wikileaks.org/plusd/cables/09STATE12945_a.html

[45] "U.S. Seeks to 'Reset' Relations with Russia - CNN.com," March 7, 2009, http://www.cnn.com/2009/WORLD/europe/03/07/us.russia/index.html.

[46] "U.S.-Russia Relations: 'Reset' Fact Sheet," *Whitehouse.gov*, June 24, 2010, https://www.whitehouse.gov/the-press-office/us-russia-relations-reset-fact-sheet.

[47] "Cold Climate | The Economist," August 31, 2013, http://www.economist.com/news/europe/21584339-relations-europe-and-america-freeze-over-vladimir-putin-looks-china-cold-climate.

[48] "Russian Diplomats Are Trolling the U.S. Space Program - The Wire," May 1, 2014, http://www.thewire.com/politics/2014/05/russian-diplomats-are-trolling-the-us-space-program/361508/.

[49] "The U.S. and Russia: Still Friends in Space - The Atlantic," March 26, 2014, "OSTP Letter Report on NEOs-Senate Version-10-15-2010 - Ostp-Letter-Neo-Senate.pdf," accessed December 7, 2015, https://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp-letter-neo-senate.pdf..

Wikileaks cables show that the U.S.-Russia space collaboration is not limited to simply respecting their ISS engagements, but that they also collaborate on other space-related activities despite tensions. Diplomatic discussions from April 2008[50] between Anatoly Perminov (General Director of the Roscosmos from 2004–2011) and Dana Rohrabacher (former chair of the Space and Aeronautics Subcommittee of the House Science Committee) show potential common efforts over Near Earth Objects threats, one of the scientific priorities of the Obama administration[51]. Further meetings in June 2008 between Rohrabacher and Energiya Space Corporation President Vitaliy Lopota show high-level talks around projects as diverse as a common Moon base or even a joint mission to Mars[52]. U.S. and Russian space policy officials and experts therefore seem to have met regularly, including in Vienna in June 2009, as can be read in leaked official diplomatic cables, and were planning bilateral expert meetings to discuss issues of transparency and confidence-building measures in outer space in early 2010[53]. It interesting to note that the process of confidence building was already highlighted as core to the diplomatic practice by François de Callières[54] in the 17th century and that this concept has not aged, and still plays an important role in an area such as space diplomacy.

7. The stability of ISS on the political level

Despite the recent crisis and political skirmishes, the U.S. and Russia still maintained regular talks and diplomatic interactions around common space exploration. In March 2015, only a year after the derogatory comments by Russian Deputy Prime Minister Dmitry Rogozin, Igor Komarov, the current Head of Roscosmos, announced that the Russian space agency and NASA would extend the operation of ISS until 2020 and would be "*working together on the program of a future space station*"[55]. NASA Administrator Charles Bolden also said that there would also be a joint mission to Mars. Recent talks around a common Moon base, called "Luna 27", also show E.U. interest and participation to the Russian collaboration proposal[56]. On March 1st 2016, Russian cosmonaut Mikhail Kornienko and American astronaut Scott Kelly, returned from their historic one year long stay aboard the ISS, a collaboration aimed at studying the effect of long-

[50] "Codel Rohrabacher And Roscosmos Director Perminov Discuss Us/Russia Space Cooperation", Wikileaks, June 16, 2008, https://wikileaks.org/plusd/cables/08BERLIN795_a.html

[51] Letter, Executive Office Of The President Office Of Science And Technology Policy, October 15, 2010, https://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp-letter-neo-senate.pdf

[52] "Codel Rohrabacher Explores Future Paths Of U.S.-Russian Space Cooperation", Wikileaks, June 5 2008, https://wikileaks.org/plusd/cables/08MOSCOW1604_a.html

[53] "Non-Paper For Russia On Proposed U.S.-Russia Space Security Dialogue", Wikileaks, February 3, 2010, https://wikileaks.org/plusd/cables/10STATE11173_a.html

[54] Callières (Monsieur de François), *On the Manner of Negotiating with Princes: On the Uses of Diplomacy, the Choice of Ministers and Envoys, and the Personal Qulalities Necessary for Success in Missions Abroad* (University of Notre Dame Press, 1963).

[55] "Russia & US agree to build new space station after ISS, work on joint Mars project", Russia Today, March 28, 2015, http://www.rt.com/news/244797-russia-us-new-space-station/

[56] "Europe and Russia mission to assess Moon settlement", BBC, October 16, 2015, http://www.bbc.com/news/science-environment-34504067

duration missions on the human body[57]. To a certain extent it could also be argued that, when President G.W. Bush and his advisors took the initiative to retire the Space Shuttle program back in 2004, the U.S. administration knew it would imply relying on the Russians for sending astronauts in space and saw no issue with it. Furthermore, this dependency was not considered an issue of concern by the administrations in the following years, as the decommissioning of the program was kept on track (the Space Shuttle was eventually retired after the last flight of space shuttle *Atlantis*, on July 21st, 2011).

As can be seen through those examples, it is therefore reasonable to conclude that, even though politicians and diplomats made rash public statements, space collaboration between the U.S. and Russia remained tight at the level of space agency administrators, astronauts and scientists. If it is to be believed that during the Cold War, astronauts and cosmonauts as well as scientists from both sides of the superpowers could discuss freely enough to come up with diplomatic breakthroughs of such importance as the ASTP and later the ISS, it would be plausible to say that after more than 15 years of collaboration on the ISS, those same actors have forged even stronger links that potentially go well beyond the realm of politics. In a recent interview, NASA Administrator Charles Bolden said that "*our relationship with Russia right now is tenuous. Our relationship with Roscosmos is beautiful. The way we cooperate with them, the way we train with them in Houston and Moscow and Star City, we launch out of Baikonur, that's the model that you want for the future of humanity*"[58]. U.S. astronaut Michael Hopkins also recently said that "*the cooling relations between Moscow and Washington over Ukraine isn't felt in space at all*". In turn, the Russian Commander of the ISS Expedition, Oleg Kotov, stated that "*the people who work on this program – engineers, constructors, those, who manage the flights – are far from politics and work to achieve one common goal*"[59].

What happens when such a highly visible and prestigious endeavor is carried out together by nations? Could it provide added diplomatic stability to the overall relationship?

8. International scientific collaboration around space: interlocked.

The longstanding ISS collaboration between the U.S. and Russia has led to the creation of solid ties between the two agencies and locked their respective scientists in an interdependent, collaborative relationship to the point of becoming an anchor point while geopolitical tensions run high. Indeed, once such a large and prestigious collaboration like the ISS has been started, it is difficult for a nation to unilaterally put an end to it, for several reasons. In their "*Case for Managed International Cooperation in Space Exploration*" [60], Broniatowski et al. (2006)

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[57] "Russia announces plan to build new space station with NASA", Phys.org, March 28, 2015, http://phys.org/news/2015-03-russia-space-station-nasa.html#jCp

[58] "Giving Up On Mars Would Be "Disastrous," NASA Chief Tells IFLScience", IFLScience, December 1, 2015, http://www.iflscience.com/space/giving-mars-would-be-disastrous-nasa-chief-tells-iflscience

[59] "No politics in space: ISS example of what Russia, US can achieve working together", Russia Today, April 12, 2014, https://www.rt.com/news/russia-us-space-friends-008/

[60] D. A. Broniatowski, G. Ryan Faith, and V. G. Sabathier, "The Case for Managed International Cooperation in Space Exploration", Center for Strategic and International Studies, September 18, 2006, http://csis.org/publication/case-managed-international-cooperation-space-exploration

highlight that space collaboration saves money and that it generates diplomatic prestige as well as increases political stability.

One of the first reasons is indeed an economic one. After all, the cost of the Space Race had always been a problem for politicians at home, and one of the reason why they actively sought collaboration around space. As early as 1963, President Kennedy had already acknowledged this overlapping interest: *"Why should the United States and the Soviet Union, in preparing for such expeditions, become involved in immense duplication of research, construction and expenditure?"*[61]. The estimated price tag for the U.S. contribution to the ISS program is a total of $75 billion, of which $30.7 billion consists of Shuttle flights, a costly program[62]. This undeniably requires sharing the cost burden among nations. Sharing knowledge and technology therefore also makes sense financially.

The ISS program, with its high visibility worldwide, carries undeniable diplomatic prestige; it is important for nations engaged in space collaboration to show the world that they are contributing to the greater good of humanity and showcase peaceful relationships. Disengaging from the ISS would be seen as an extreme move, one could argue even stronger than the current economic sanctions, and a country leaving the collaboration would suffer negative public repercussions. Storming out of a peaceful room where the greater good is being discussed is never perceived as wise. The continuation of the collaboration is therefore a mandatory act of public diplomacy. At a recent event (5 March 2013) discussing NASA's role in diplomacy, Kent G. Bress, the Director of Aeronautics and Cross Agency Support Division at NASA's Office of International and Interagency Relations, declared that "*many NASA programs that start out by filling a mission requirement also aid in diplomatic relations, and eventually play a role in public diplomacy*"[63]. It is also worthwhile to note that NASA's main twitter account has more than 3.5 million followers, making it the second largest twitter feed after the White House. Hence space collaboration around the ISS is also a way to show that the disagreements could only be temporary, and that long-term investments in peaceful collaboration are worthwhile and durable, signifying that this "all-time low" is only a lull, and that there is hope for change if politics are reversed on Earth.

The political stability and diplomatic interlocking provided by space collaboration has been noted, and voiced, by astronauts. Commander Scott Kelly, the current ISS commander, has near 700,000 followers on twitter[64] and former ISS Commander Chris Hadfield 1.48 Million[65], thus making them highly public figures, as visible as Francois Hollande or David Cameron (1.3 Million each). Astronauts are therefore constantly engaging in very visible public diplomacy. An

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[61] "Address at 18th U.N. General Assembly, 20 September 1963", September 20, 1963: 16-20, http://www.jfklibrary.org/Asset-Viewer/Archives/JFKPOF-046-041.aspx

[62] "Extending the Operational Life of the International Space Station Until 2024", Audit Report, NASA Office of Audits, September 18, 2014, https://oig.nasa.gov/audits/reports/FY14/IG-14-031.pdf

[63] "NASA's Public Diplomacy – Improving Relations on Earth by Exploring Space", The American Security Project, March 6, 2013, http://www.americansecurityproject.org/nasas-public-diplomacy-improving-relations-on-earth-by-exploring-space/

[64] "Scott Kelly (@StationCDRKelly) | Twitter," accessed December 7, 2015, https://twitter.com/StationCDRKelly.

[65] "Chris Hadfield (@Cmdr_Hadfield) | Twitter," accessed December 7, 2015, https://twitter.com/Cmdr_Hadfield.

example is the astronauts' collective call that was played to the heads of states at the opening of COP21[66]. Even though astronauts are technically employees of NASA, this was not initiated by the U.S. government but by the Association of Space Explorers (ASE: its members are astronauts that have completed at least one space orbit of the Earth), via a non-profit called "Planetary Collective"[67].

9. Lessons learned from ISS: the case for Chinese collaboration

The history of U.S.-Russia collaboration in space shows that countries opposed in the political sphere can make diplomatic progress in parallel on other issues, and that scientific collaboration can be a powerful tool in bridging gaps in pursuing a greater, more stable, common goal. What are the lessons that can be drawn from these parallel diplomatic relations when looking at the current situation between the U.S. and China when it comes to space collaboration? Could high-level foreign policy be counteracted by science diplomacy?

A series of events led to the recent deterioration of U.S.-China relations and had repercussions on space policy. Accusations of recurrent industrial espionage, the Chinese military anti-satellite weapons (ASAT) tests in 2007 and the alleged lack of transparency in China's space activities[68] paved the way for the U.S. Congress to insert a two-sentence clause to the 2011 U.S. spending bill prohibiting the NASA and the Office of Science and Technology Policy (OSTP) "*to develop, design, plan, promulgate, implement or execute a bilateral policy, program, order, or contract of any kind to participate, collaborate, or coordinate bilaterally in any way with China or any Chinese-owned company*"[69]. The language also prevented any NASA facility from receiving "*official Chinese visitors*", which were therefore even barred from attending scientific conferences.

In 2013, however, backlash from scientists started, with prominent American scientists boycotting NASA scientific conferences that banned the presence of Chinese scientists[70]. As an integral part of the international astronomy and space science community, Chinese scientists collaborate quite extensively on the data from many of the international scientific missions, including NASA's satellite missions such as Kepler, an exoplanet hunter satellite, and contribute significantly to the overall science, jointly publishing with American scientists. Many doctoral

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[66] PlanetaryCollective, *Call to Earth - A Message from the World's Astronauts to COP21*, 2015, https://www.youtube.com/watch?v=NN1eSMXI_6Y.

[67] According to https://www.youtube.com/user/PlanetaryCollective/about: "*Planetary Collective is a growing group of individuals and organizations striving for a unified vision. We aim to ignite a shift in perspective and reawaken our audience to a deeper understanding of the world around us; to remember and reclaim our interconnection with the biosphere and each other. We currently produce documentary films with community based interactive installations and more in the works.*"

[68] "Notification Regarding Nasa-CNSA Civil Space Cooperation", Wikileaks, June 24, 2008, https://wikileaks.org/plusd/cables/08STATE67989_a.html

[69] "Congress Bans Scientific Collaboration with China, Cites High Espionage Risks", Forbes.com, May 7, 2011, http://www.forbes.com/sites/williampentland/2011/05/07/congress-bans-scientific-collaboration-with-china-cites-high-espionage-risks/

[70] "US scientists boycott NASA conference over China ban", The Guardian, October 4, 2013, http://www.theguardian.com/science/2013/oct/05/us-scientists-boycott-nasa-china-ban

and post-doctoral students in American astronomy and space science research institutions are also Chinese nationals. In 2014, during a trip to Beijing organized by the Association of Space Explorers, astronaut Chris Hadfield tried to promote space cooperation between the two countries[71]. In his remarks, he cited the ISS as "*proof that enmity and suspicion could be overcome*". The International Planetary Congress of ASE is an annual event; given the small, highly-visible and elitist nature of this community that has the ears of the most powerful politicians as well as the general public, it would not be surprising that track II diplomacy plays an important role there every year.

In November 2015, NASA Administrator Charles Bolden said that a manned mission to Mars would happen in 2030 (which he had alluded to in a discussion at the Harvard University Institute of Politics during an event around "Exploring Space & Interstellar Travel" on October 27th, 2015), and that the mission would be a collaborative one, involving Russia but also China as well[72], indicating that there may have been informal talks between the two agencies. If a historic parallel was to be drawn between the impact the movie "Marooned" (1969) had over the U.S.-U.S.S.R. ASTP negotiations in 1972 and the recent blockbuster movie "The Martian", released in 2015[73] (and so acclaimed by the international scientific community that it is featured on the NASA website[74]), collaboration between the U.S. and China is inevitable. In the movie "The Martian", after the Chinese space agency learns that a NASA astronaut has been left stranded on the Red Planet with no hope of return because of the lack of available rockets, the Chinese scientists directly contact their American counterparts, bypassing their respective governments, to offer their "secret" rocket for the rescue plan. If the historical examples of this paper and the power of track II diplomacy are to be believed (as well as Hollywood!), this situation should not last long, and U.S.-Chinese collaboration around space should – and must – resume their due course in the near future.

10. Conclusion

Due to the ever-increasing number of actors (states, private corporations, etc.) and the important impact that space activities (e.g. launcher technology, satellite information, resources) have had, and will increasingly continue to have on the world order and diplomacy at large, it is key to analyze ongoing tensions through the lens of history. Furthermore, looking at the various practices of diplomacy (here space diplomacy) within a theoretical framework by analyzing the underlying types of diplomacy at work, provides the necessary nexus to understand issues in space diplomacy and make sense of an otherwise political and journalistic hype around current events, such as the recent perceived fallout of geopolitical tensions onto space collaboration.

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[71] "Astronaut Chris Hadfield uses China trip to promote space cooperation", The Guardian, September 24, 2014, http://www.theguardian.com/world/2014/sep/24/astronaut-chris-hadfield-china-trip-international-space-nasa

[72] "The Future Of Space Policy Is Built On International Cooperation: NASA Administrator Charles Bolden", International Business Times, November 16 2015, http://www.ibtimes.com/future-space-policy-built-international-cooperation-nasa-administrator-charles-bolden-2186627

[73] Ridley Scott, *The Martian*, Adventure, Comedy, Drama, (2015), http://www.imdb.com/title/tt3659388/.

[74] "Nine Real NASA Technologies in The Martian", NASA.gov, August 19, 2015, https://www.nasa.gov/feature/nine-real-nasa-technologies-in-the-martian/

Indeed, lessons learned by looking at the diplomatic history can shed light onto current events. Here, despite the geopolitical tensions and the terrible confrontations that the world remembers of the two superpowers during the Cold War (a period much worse than the current one), space has surprisingly been an area of collaboration. While it is undeniable at times collaboration may not have been possible because of extreme tensions or suspicion and a general quest for technological dominance, the will to collaborate has always been there, sometimes stemming from top-down foreign policies but most certainly coming from scientists engaged in space exploration, beyond national boundaries. In the collaboration around space, general practices show hidden diplomatic forces at work, identified as science diplomacy and track II diplomacy. These two play a key role on a deeper, unseen level, well below foreign policy or traditional diplomacy, and at times counter-current. As has been argued here, these informal, track II processes can bottom up and eventually influence foreign policy and high politics in the long run. General foreign policy and geopolitical tensions, like choppy waves on the ocean surface, constitute the immediately visible part of the diplomatic mass, but science or track II diplomacy can also be strong undercurrents lying well below the surface, and can potentially have a much more significant impact on the general direction of movement. Indeed, certain groups and transnational epistemic communities (such as scientists or astronauts in the case of the space sciences), adhere to ideologies that go beyond national ambitions, sometimes transcending national agendas and top-down foreign policy. These transnational communities can, at crucial times, be effective diplomats and significantly enhance collaboration between otherwise reluctant state actors. While it would obviously be pretentious to say that scientific collaborations can solve geopolitical problems, they can certainly help in easing tensions and bringing nations closer together, and should be further investigated. Scientific endeavor, especially one as dangerous (and therefore bonding) as space exploration, can therefore easily build bridges across political, religious and cultural divides. Indeed, as remarked by Thorson and Seo (2014), "*science*" (and here space science) "*can serve as an attractive mode for trust building and cooperative engagement between countries where formal political or diplomatic relations have been strained or are nonexistent*"[75].

[75] Stuart Thorson and Hyunjin Seo, "Building Partners Through Academic Science," *Asian Perspective* 38, no. 1 (March 2014): 137–61.