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IFAR[2] Fact Sheet

Is the European Initiative for an International Code of Conduct the right Step forward for Conflict Prevention in Outer Space?

The International Code of Conduct is an agreement developed by the European Union in order to enhance the security, cooperation and sustainability of outer space. The non-binding agreement complements the existing treaties and builds on cooperation and transparency among space actors. This fact sheet examines the Code and its perception within the United Nations. Subsequently, it asks, whether the Code is an adequate tool to deal with the specific issues of space and security in regard to the prevention of an arms race in outer space.

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Introduction

Societies worldwide rely increasingly on space technologies. The most striking examples are in the fields of communication, traffic-management, earth-observation, agriculture, exploitation of natural resources, early warning, health and education. In the military sector, key network-centric capabilities, such as command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) depend on space assets. Application possibilities are observation, weather information, precision-guided munitions, drones, logistics and military communication. Therefore, outer space is an increasingly used domain. Space-based infrastructure is an elementary part of NATO operations. In particular, the US demands the use of space-based assets among NATO partners. Equally important, decades after the space race between the two superpowers, new actors have come into play. Following the US and Russia, the European Union and China are implementing global satellite navigation systems while India and Japan are implementing regional ones. In addition, these countries are investing broadly in space technology. Space technology is perceived to be central for the development of cutting edge technologies and success on global markets. Furthermore, space has a high symbolic value for every nation. However, experts are concerned that outer space might provide the arena for a future arms race in the field of anti-satellite (ASAT) capabilities.[1]

According to the Union of Concerned Scientists 1,419 operative satellites are currently orbiting the earth.[2] Most of them are communication satellites. Others are designed for meteorology, earth observation and for surveillance and reconnaissance purposes. But the entire extent of military use remains hidden. Space technology is, as a rule, dual-use, which means it can be utilized for civilian and military purposes alike, and in the case of satellites, even simultaneously.

[1] Sam Jones, November 20, 2015: *Satellite wars, A new arms race in our skies threatens the satellites that control everything from security to communications*, The Financial Times Ltd., UK Edition, (or) David Livingstone and Patricia Lewis, September 2016: *Space, the Final Frontier for Cybersecurity?*, Chatham House, (and) Dr. Adityanjee, 2015: *ASAT Program with Chinese Characteristics*, MyIndMakers.

[2] Union of Concerned Scientists, UCS Satellite Database (launches through 30.06.2016) The total number of operating satellites has risen to 1,419; 576 belong to the US, 181 to the PR China, 140 to Russia and the remaining 522 to other states, available at: http://www.ucsusa.org/nuclear-weapons/space-weapons/satellite-database

Observation satellites provide detailed information about military targets. Navigation satellites, in connection with recent information technology, steer missiles and drones. On a global scale, satellites are essential parts of civilian and military infrastructure. That makes them attractive military targets. The destruction of satellites in outer space can be carried out by three operational principles: nuclear weapons, directed energy weapons (DEW) and kinetic energy weapons (KEW).[3] While attacks with nuclear warheads are outlawed internationally, strikes through direct-ascent ASAT systems and blinding-lasers have already been carried out by the US, Russia and the People's Republic of China.

The Chinese ASAT tests in 2007 and 2013 provoked worldwide consternation. The US followed suit with the destruction of a defunct USA-193 satellite in 2008.[4] In the US, China is perceived as a potential threat to national security and serves as a constant justification for military armament. Joan Johnson-Freese, in her testimony before the US-China Economic & Security Review Commission, elaborated: '*Counterspace Operations, indicated that space was seen as the fourth battlespace. The United States vigorously pursued small satellite technology similar to the BX satellites China is developing and the U.S. sees as threatening. An Air Force official was quoted in the trade publication 'Inside the Pentagon' about the Air Force XSS program that 'XSS-11 can be used as an ASAT weapon.''*[5] Whereas Chinese experts fear that the US might start a new space race in regard to ASAT systems against the People's Republic.[6]

Along with technical progress, there is an increasing danger of proliferation of missile defense and ASAT systems. China is conducting research and development on its ASAT program.[7] Russia will restart its airborne laser and its air-launched ASAT program,[8] while the US has made progress with the Aegis SM-3 Block IIA ballistic missile interceptor, which will be deployed on the Aegis Ballistic Missile Defense (BMD)[9] system in 2018. The Aegis interceptor technology is being developed in cooperation with Japan and likely to be sold to Europe and South Korea.[10] This will be an alarming development with respect to the international proliferation of ASAT capabilities. The US military has denied that the Aegis BMD is designed as an ASAT weapon system, but if the Aegis system is connected with a spaced based warning system, a mere software change in the control system would allow tracking, intercepting and destroying satellites. Naturally this modification cannot be detected externally. While the current SM-3 Block IA version has a limited range of 600 kilometers, the new Block IIA version reaches up to 2.350 kilometers.[11] This encompasses all Low Earth Orbit (LEO)[12] satellites. Block IIA will be deployed on ships, which implies superior flexibility in regard to potential targets, and on ashore sites.[13] Moreover, there is the unresolved issue of the US X-37B test vehicle or space plane. The space plane is a classified project of the US military, which is suspected to have an ASAT mode.[14] Small satellites and technologies for the removal of space debris are technically capable of providing ASAT capabilities as well.[15]

[3] Götz Neuneck, Andrè Rotkirch, 2006: *Weltraumbewaffnung und Optionen für präventive Rüstungskontrolle*, Forschung DSF N°6, Deutsche Stiftung Friedensforschung, p. 26.
[4] Brian Weeden, 2014: *Through a Glass, Darkly, Chinese, American, and Russian Anti-Satellite testing in Space*. Secure World Foundation, p.26.
[5] Joan Johnson-Freese, 2015: Testimony before the U.S.-China Economic & Security Review Commission, *China's Space & Counterspace Programs*, p. 9. Available at: http://tinyurl.com/zuqmnvh
[6] Gregory Kulacki, September 7, 2016: *The United States, China, and Anti-Satellite Weapons*, Union of Concerned Scientists, available at: http://tinyurl.com/h8qb9ze
[7] Please see also: https://en.wikipedia.org/wiki/ASAT_program_of_China
[8] Weeden, 2014: 39.
[9] Götz Neuneck, Christian Alwardt and Hans Christian Gils, 2015: *Raketenabwehr in Europa*, Akademie der Wissenschaften in Hamburg (Hrsg.), Nomos, Baden-Baden.
[10] Laura Grego, 2012: *A History of Anti-Satellite Programs*, Union of Concerned Scientists, p. 12.
[11] Weeden, 2014, p. 27.
[12] NASA Earth Observatory, available at: http://earthobservatory.nasa.gov/Features/OrbitsCatalog/
[13] Weeden 2014, p. 26.
[14] Laura Grego, David Wright and Stephen Young, Union of Concerned Scientists, Factsheet, 2012: *The X-37B "Space Plane": Still No Clear Mission, at a High Price.* Available at: http://tinyurl.com/gw2z2p8
[15] Spaceflight 101.com, June 29, 2016: *China's new Orbital Debris Clean-Up satellite raises Space Militarization Concerns*, available at: http://tinyurl.com/jrxs5co

In addition to the proliferation of BMD and ASAT capabilities, there is the issue of space debris. Space debris is extremely dangerous. It consists of leftovers of space missions and human utilization of space. The scope here ranges from nuts and bolts to rocket stages, 2,600 defunct satellites and the remnants of explosions.[16] Since the height of the space race between the US and the Soviet Union in the 1950 and 1960s, 4,900 space launches have taken place and the number of traceable objects in outer space amounts to 18,000.[17]

The problem is significant. Space debris circulates at a very high speed, up to 10 km per second,[18] and even a collision with a relatively small piece can lead to the destruction of a satellite or cause risky damage to a spaceship and, thereby, produce new debris. Space debris is categorized by size. 29,000 objects larger than 10 cm, the incredible number of 700,000 objects larger than 1 cm, 200 million particles larger than 1 mm and trillions of particles larger than 0,1 mm are estimated to be orbiting the earth.[19] This is a perilous pollution of the space environment and a latent danger to any spacecraft. Satellites in LEO and on sun-synchronous orbits are especially at risk. The Chinese ASAT test in 2007 alone produced 3,000 traceable objects.[20] These bits of debris will remain at higher altitudes for longer than a century.[21] However, this incident is outstanding and China has not generated a comparable amount of debris since then. According to NASA, the majority of the objects are due to the Soviet Union and the US, whereas the European Union is irrelevant as an originator of space debris. Measurements of the mass of debris particles confirm that the US accounts for 23,4 percent, the former Soviet Union and Russia for 62,4 and China for 4,2 percent.[22] Even though the largest amount of debris stems from the space race, new actors, such as ESA and emerging space powers, such as Japan and India, are contributing noteworthy scientific research and technological solutions for the problem.

Is the Outer Space Treaty, the 'Magna Charta of Space', still adequate?

'The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.' (OST, Article 1, Paragraph one)[23]

Despite the increasing relevance and often conflicting uses of the space environment, the legislative body of space law dates back to the 1960s and 1970s. After considerable negotiations between the two superpowers, the basis of legal regulation in space, the Outer Space Treaty (OST), entered into force in 1967.[24] In accordance with the principles of the United Nations (UN), the OST extended international law not only to celestial bodies, such as planets, moons and asteroids, but also to space as an entity. At the core of this extensive framework is the commitment to a beneficial and peaceful use of outer space without any discrimination towards weaker states.[25] The OST demands cooperation and mutual assistance of all state parties and urges them to undertake international consultations before executing experiments or activities that can harm or interfere with the interests of other state parties in the peaceful exploration and use of outer space. The most significant achievement of the treaty is the ban on weapons of mass destruction from outer space, which is enshrined in Article 4 of the OST:

[16] ESA, Space Debris: http://www.esa.int/Our_Activities/Operations/Space_Debris/About_space_debris.
[17] ESA, Space debris Conference, available at: https://conference.sdo.esoc.esa.int/
[18] Carsten Wiedemann and Peter Vörsmann, 2011: *Die Bedrohung durch Weltraumtrümmer: Hype oder reale Gefahr?*, Technische Universität Braunschweig, Institut für Luft-und Raumfahrsysteme, Presentation, p.7.
[19] ESA, Space in Images: http://www.esa.int/spaceinimages/Images/2013/04/Distribution_of_debris
[20] Weeden, 2014, p. 9.
[21] DLR Raumfahrtmanagement, Weltraummüllforschung: http://www.dlr.de/rd/desktopdefault.aspx/tabid-2265/3376_read-5091/
[22] J.C. Liou, 21 July 2011: *Orbital Debris and Future Environment Remediation*, Nasa HQ, Washington DC, available at: http://tinyurl.com/hyrxcdy
[23] United Nations Office for Outer Space Affairs, 2222 (XXI). *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (OST)*, Article 1.
[24] United Nations Office for Legal Affairs, *Audiovisual Library of International Law*: http://legal.un.org/avl/ha/tos/tos.html
[25] OST, Article 1.

'States Parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.'

The 104 states that have ratified the treaty so far, among them the major space powers, have agreed to be held responsible internationally for their actions in space. This includes issues of information, transparency as well as the avoidance of contamination of the space environment. In addition, specific aspects have been regulated in the Agreement on the Return of Astronauts and the Return of Objects into Outer Space (ARRA), the Convention on International Liability for Damage Caused by Space Objects (LIAB), the Registration Convention (REG) and the MOON Agreement.[26]

The ARRA or Rescue Agreement demands the rescue of astronauts and endorses them as envoys of humankind. This view originates from the space race. Since then, astronauts have seldom been rescued. That is why the agreement appears non-essential at first sight. However, appearances are deceiving. The agreement calls not only for the rescue of astronauts, but also for the recovery of 'space objects' and the number of those is increasing.[27] Several objects have already been secured and successfully transferred. Recently the phenomenon of so-called 'space tourists' raises some challenging new questions about the legal implications of humankind in space.

The LIAB or Liability Convention holds launching states liable for any damage caused by its space object 'on the surface of the earth, to aircraft flight and in space'. This includes persons or property on board space objects. The convention settles the proportional division of costs in the case of multiple liabilities. Against the background of an increasingly crowded space environment, new technologies and conflicting interests, a specification of the Liability Convention is required. The terms 'damage' and 'space object', in particular, have proven insufficient. Furthermore actual events, such as the crash of the Russian satellite Cosmos 954, which has spread radioactive debris on Canadian territory, the violation of privacy rights by a growing number of Nano satellites and liability in the event of a malfunction of a Global Navigation Satellite System (GNSS), demand adequate regulation. [28] In order to identify the state in charge of a certain object, the UN established an international register of space objects, the Registration Convention. This register consists of the national registers of the participating states. According to the UN, 92 percent of all space objects have been registered so far. Valid registration is an essential precondition for the legal enforcement of the Liability Convention.

The MOON Agreement clarifies some issues of the OST. It allows scientific investigations in accordance with international law and forbids any military activity on the surface of the moon or its trajectory. The agreement declares the moon as 'no subject to any national appropriation'[29] and prevents states, organizations and NGOs from governing the exploitation of its national resources. On the other hand, it demands the establishment of an international regime to regulate the retrieval of natural resources. Unfortunately, the only significant signatories are France and India. No major space power has ratified the Moon Treaty.

Even though the OST was thoroughly negotiated between the two superpowers, it has some loopholes. With the exception of weapons of mass destruction (WMD), the treaty does not ban: 'ASAT-weapons, the deployment of conventional weapons in space, the passage of missiles, the utilization of satellites for military purposes such as reconnaissance, surveillance, tactical com-munication and navigation, the deployment of military personnel for peaceful missions and

[26] United Nations Office for Outer Space Affairs, *Space Law Treaties and Principles*, available at: http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html

[27] Frans G. von der Dunk, 2008: *A Sleeping Beauty Awakens: The 1968 Rescue Agreement after Forty Years*, Law College of the University of Nebraska, Lincoln, available at: http://digitalcommons.unl.edu/spacelaw

[28] Elena Carpinelli and Brendan Cohen, *Interpreting "Damage Caused by Space Objects" under the 1972 Liability Convention*, available at: http://www.iislweb.org/docs/Diederiks2013.pdf

[29] Article 11.2, *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*, United Nations Office for Outer Space Affairs, available at: http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/moon-agreement.html

scientific purposes.'[30] The following table gives an overview over the international treaties relevant for the outer space domain:

The International Treaties for Outer Space

Status January 2016	Signature and Ratifi-cation	Signature only	Adoption by the General Assembly	Entry into Force
OST	104	25	*Dec.* 1966	*Oct.* 1967
ARRA	94	24	*Nov.* 1967	*Dec.* 1968
LIAB	92	21	*Nov.* 1971	*Sept.* 1972
REG	62	4	*Nov.* 1974	*Sept.* 1976
MOON	16	4	*Dec.* 1979	*July* 1984

Apart from significant regulatory gaps and national interest that might undermine the OST, there is a constant risk because of the dual-use capability of space assets. When it comes to international agreements, nations tend to believe that civilian and military issues can be dealt with separately. This does not apply to space. The whole debate is a civil as well as a military one at all times. Furthermore, it is negligent to perceive outer space as a hermeneutically sealed environment. Outer space is a strongly interrelated domain. For example, most ASAT capabilities are situated on earth. Satellites can be successfully targeted from the ground by kinetic kill vehicles, ballistic missiles, blinding lasers and, cost-effectively, by cyber-attacks or jamming and spoofing.[31] In addition, pressing issues, such as the pollution of low Earth orbit (LEO) by space debris or liabilities of private actors were not foreseeable at the time the OST was negotiated. Against this background, the existing space law is insufficient for the management of some security issues and the prevention of an arms race in outer space.

The EU wants to close this gap with the draft of an International Code of Conduct (CoC). So far, other attempts to map ancillary legislation in the responsible bodies of the UN have not succeeded. Exclusively military issues, such as the Initiative for the 'Prevention of an Arms Race in Outer Space' (PAROS), have been discussed under the auspices of the Conference of Disarmament (CD). Unfortunately the CD has not reached an agreement. A far more satisfactory approach is the establishment of the Group of Governmental Experts (GGE) by UN Secretary-General Ban Ki-moon. The GGE presented substantial and generally acknowledged recommendations for Confidence-building Measures (TCBMs) in outer space.[32] Furthermore, another esteemed approach under the auspices of the UN has been made by the Scientific and Technical Subcommittee (STSC).

Incomplete Efforts within the UN

The Committee on the Peaceful Uses of Outer Space (COPUOS)[33] provides a well established platform for international negotiations and dialogue on scientific, technical and geopolitical issues related to the peaceful uses of outer space. UN COPUOS fosters international cooperation and sustainable development in outer space. The STSC initiated the primary Working Group on the Long-term Sustainability of Outer Space Activities (LTS Working Group) in 2010. In 2011, expert groups on 'Sustainable space utilization supporting sustainable development on Earth', 'Space debris, space operations and tools to support space situational awareness sharing', 'Space weather' and 'Regulatory regimes and guidance for new actors in the space arena' were established. In 2014, the expert groups provided draft guidelines on issues, such as international cooperation, regulatory frameworks, information, space situational awareness and sustainability of space activities, [34] which were assessed by the Chair of the STSC, Peter Martinez. Throughout the following year, member states were encouraged to submit additional draft guidelines. The revised 'Guidelines for the long-term sustainability of outer space activities' (LTS Guidelines) are expected to be

[30] Götz Neuneck, Andrè Rotkirch, 2005: *Weltraumbe-waffnung und Optionen für präventive Rüstungskontrolle*, IFAR / IFSH Working Paper Nr.10, p. 85.
[31] Alexander Rügamer and Dirk Kowalski, May 2015: *Jamming & Spoofing of GNSS Signals – An Underestimated Risk?!,* FIG Working Week 2015.
[32] Christopher Johnson, April 2014,*The UN Group of Governmental Experts on Space TCBMs*, Secure World Foundation, available at: http://tinyurl.com/hgxs3bs
[33] The Members of the UN COPUOS are available at: http://www.unoosa.org/oosa/en/members/index.html
[34] Christopher Johnson, 2014: *The UN COPUOS Guidelines on the long-term sustainability of Outer Space Activities*, Secure World Foundation, available at: http://tinyurl.com/z25jwo3

finalized in February 2017 during the fifty-fourth session of UN COPUOS in Vienna and, subsequently, will be passed on to the UN General Assembly for approval.

The EU Initiative for an International Code of Conduct for Outer Space Activities

Around the turn of the century, initiatives for an adjustment of the OST, an additional treaty or so called 'rules of the road' began to surface. The proposals ranged from a complete ban on weapons and ASAT capabilities in space through a framework resembling the Ottawa-Treaty for the ban on landmines, to significant limitations, such as a proliferation regime for space weapons and ASAT capabilities, with the exception of missile defense systems.[35] On the other hand, a ban on all military activities in LEO was considered as an option. As a response to the increasing significance of space for the lives of the global population, economic development and military affairs, and a reaction to the Chinese ASAT test, the EU came forward with an initial draft of a Code of Conduct in 2008. After consultations with the US and two international panels, a revised version of the draft for an International Code of Conduct for Outer Space Activities was authorized by the member states of the EU in March 2014 and presented to the UN in 2015.

What are the Intentions of the Code?

The Code is supposed to enhance safety, security and sustainability in outer space.[36] In order to achieve this objective, it sets up norms and rules in accordance with international space law and the principles of the United Nations relating to outer space activities. This regulatory framework signifies that space shall be used for the benefit of all nations regardless of their political power and technological abilities. Under the heading 'general principles' the Code urges the signatory nations to desist from the use of force, but acknowledges their right to self-defense: *'the responsibility of states to refrain from the threat or use of force against the territorial integrity or political independence of any state, or in any manner inconsistent with the purpose of the Charter of the United Nations, and the inherent right of states to individual or collective self-defense as recognized in the Charter of the United Nations.'*[37] Moreover, the Code wants to serve as a measure for conflict prevention. It refers to: *'the responsibility of States, in the conduct of scientific, civil, commercial and military activities, to promote the peaceful exploration and use of outer space for the benefit, and the interest of humankind and to take all appropriate measures to prevent outer space from becoming an arena of conflict'.*[38]

Furthermore, the Code intends to complement the existing treaties and UN institutions and to foster two general principles: Cooperation and transparency. With respect to the issue of cooperation, it requests that the subscribing states:

- Promote the development of guidelines for outer space operations within appropriate international fora like UN COPUOS or the Conference of Disarmament; (Article 3.2.)
- Facilitate safety and security of outer space operations and long term sustainability of outer space activities; (Article 1.1.)
- Establish and implement policies and procedures that minimize the risk of collisions in space or any other form of harmful interference; (Article 4.1.)
- Reaffirm reconciliation and consultation through diplomatic channels in case of conflict; (Article 7.1.)

In terms of transparency, it prescribes the implementation of information and confidence building measures, such as:

- Pre-notification of incidents, such as scheduled maneuvers, predicted con-junctions, the launch of space objects, collisions, break-ups in orbit, high-risk re-entry events, malfunctioning of space objects; (Article 5.1.)

[35] Götz Neuneck, Andrè Rotkirch, 2005: *Weltraumbewaffnung und Optionen für präventive Rüstungskontrolle*, IFAR, IFSH Working Paper #10, p. 92.

[36] European Union External Action Service, Disarmament and Non-proliferation, Outer-space-activities, *Code of Conduct for Outer Space Activities*, Draft International Code of Conduct for Outer Space Activities, 1.1. Purpose and Scope, p. 3.

[37] CoC, Article 1.2. General Principles, line 26.

[38] Ibid. line 28.

- Disclosure of space strategies and policies, major space research and application programs, official procedures as well as political efforts taken on the international stage; (Article 6.1.)
- A central point of contact; (Article 9.1.)

In addition, it tackles sensitive security-related issues, such as the claim for subscribing states to share: *'their space strategies and policies including those which are security-related, in all aspects which could affect the safety, security, and sustainability in outer space.'*[39]

A Path strewn with Obstacles

The Code was supposed to be negotiated at the UN in front of 100 Representatives from 27 July to 31 March 2015. However, the mandate of the EU even to call for such a negotiation was challenged by procedural concerns. The first challenge noted that the EU had no mandate at the UN and, therefore, denied the EU the right to call for an official meeting. Only a consultation process was granted. As a consequence, this allowed member states the presentation of alternative texts. In the end, the reception of the Code was a mixed one. The US, Japan and India welcomed the draft as a preventive diplomatic approach to address new challenges in space. They approved the idea of diplomatic, non-binding regulation via soft-law, whereas Russia and China rejected it in favor of their own project the 'Treaty on Prevention of the Placement of Weapons in Outer Space and the Threat or Use of Force against Outer Space Objects' (PPWT).[40]

What were the Points of Friction?

The ongoing debate concerning the draft of an International Code of Conduct and the unfavorable perception of it in the General Assembly affects matters, such as the idealistic concept of an inclusive process within the UN, the issue of the incorporation of the right of self-defense in the draft, the advantage or disadvantage of soft-law and last, but not least, the question of the nature of the Code.[41] First, there is the issue of inclusion: The majority of the participating countries, the Non-Aligned Movement (NAM) and the group of emerging national economies, Brazil, Russia, India, China and South-Africa (BRICS), want the Code to be negotiated under the rule of consensus within the UN framework. Previous consultations were perceived as mere diplomatic moves.[42] Others, namely European countries and the US, referred to lengthy negotiation processes within UN institutions, which, in the case of the Fissile Material Cut-off Treaty (FMCT), lasted longer than a decade.[43] The CD, especially, is perceived as a dead end for disarmament initiatives.[44] In this context, the issue of the efficiency of consultations within the UN framework should be addressed by the General Assembly. Second, there is a wide opposition to the phrase 'the inherent right of states to individual or collective self-defense.'[45] Adversaries perceive the expression as an impediment to any serious attempt to establish an arms control regime for outer space.

The arms control expert Michael Krepon argues in defense of the US-position: *'Capabilities for ASAT warfare have long existed, but have not resulted in destroying or disabling another country's satellites, even during the roughest patches during the Cold War. Why such uncommon restraint during the entirety of the Space Age? Because Moscow and Washington insisted on the right of self-defense and because they knew that warfare in space would not be confined to space.'*[46]

[39] CoC, Article 6.1. Information on Outer Space Activities, line 73.
[40] Council on Foreign Relations, 2008: *Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects (PPWT,)* available at: http://tinyurl.com/zchtjhn
[41] Lucia Marta, December 17, 2015: *Code of conduct on space activities: unsolved critiques and the question of its identity*, Fondation pour la Recherche Stratégique, note n°26/2015, p.3.
[42] Ibid. p.3.
[43] Michael Krepon, August 4, 2015: *Space Code of Conduct Mugged in New York*, published online: http://www.armscontrolwonk.com/
[44] James Clay Moltz, *Chapter 27*, 2012: *The Code of Conduct: A Useful First Step* in: *Decoding the International Code of Conduct for Outer Space Activities*, Institute for Defence Studies and Analyses, Pentagon Press, New Delhi, p.143.
[45] Code of Conduct for Outer Space Activities, 2. General Principles (section 26), *Draft International Code of Conduct for Outer Space Activities*, European Union External Action Service.
[46] Krepon, 2015.

Yet, at present, Russia, China and Brazil, reinforced by some NAM countries, prefer an agreement solely about the peaceful uses of outer space, which should be negotiated within UN COPUOS.[47] While some countries might share a genuine concern, the Chinese and Russian position on this question has been perceived as a fig leaf, due to the unforthcoming approach in their draft for the PPWT. Proponents of the Code argue that, without this clause, the US would never support the draft and the chances of establishing new norms in space would be diminished. The issue of soft-law is another focal point in the debate. There is a dispute about its being an advantage, because major space-faring nations, such as the US, would only agree to a non-binding agreement. It is presumed that nations, such as Russia, China, India and other emerging space actors, are not likely to adhere to a binding agreement either. On the other hand, a non-binding agreement may not prove effective in achieving compliance. The Indian defense analyst Ajey Lele summarizes: *'In reality mechanisms like the HCoC[48] and the CoC have extremely limited relevance and serve no purpose beyond offering a 'feel good' notion. It would be naïve to think that states actually care for such non-binding mechanisms.'*[49]

The International Code of Conduct for Outer Space Activities is supposed to increase safety and sustainability in outer space, but the EU did not succeed in convincing the majority of countries in the General Assembly of the United Nations. Many NAM countries, in allegiance with China, Russia, Iran and Brazil, prioritize the prevention of an arms race in outer space. From their perspective this could only be achieved with a legally binding agreement, which includes military security issues. Transparency and confidence building measures (TCBMs) as proposed by the Code seem redundant in this context. Furthermore, they worried that the Code would compromise serious efforts that might lead to a binding agreement. Conversely, emerging space actors, such as India, fear that their future activities might be limited by any agreement. They suggest technological cooperation between space-faring and non-space-faring nations as bait to engage in regulatory activities. Russia and China, in particular, would not commit to any framework that could compromise the PPWT. The PPWT, on the other hand, is perceived as an instrument for blockading sensible efforts of the international community.[50]

The PPWT provides a binding agreement for arms control in outer space. But, according to Robert Wood, US representative to the CD, the treaty remains, fundamentally flawed,[51] because ASAT systems and ground-based assets are not embodied in the document. Wood resumes: '*Moreover, we would note that, typically, arms control treaties that prohibit the deployment of a class of weapon also prohibit the possession, testing, production, and stockpiling of such weapons to prevent a country from rapidly breaking out of such treaties. The PPWT contains no such prohibitions and thus a Party could develop a readily deployable space-based weapons break-out capability.*'[52] Furthermore, the treaty does not differentiate between state parties and non-state parties. This might prove dangerous for the relevance of customary law in the space environment.[53] Besides, the leading force in space - the US - would not tolerate the slightest restraint on its space strategy. US military experts warn that the United States of America, if committed to the Code, would be restricted, to the benefit of geopolitical adversaries, such as Russia and China. This diminishment of America's position as the leading force in space would, contrary to the intentions of the Code, create a more insecure space environment.[54] In this case the occupation of the military high ground weighs more heavily

[47] Krepon, 2015.
[48] The Hague Code of Conduct (HCoC) is an international agreement against the proliferation of ballistic missiles, see also: https://www.armscontrol.org/act/2003_01-02/icoc_janfeb03
[49] Ajey Lele, June 18, 2012: *Space Code of Conduct: Inadequate Mechanism*, Institute for Defence Studies and Analyses, available at: http://tinyurl.com/zwnuym9
[50] Krepon, 2015.
[51] Robert A. Wood, September 9, 2014: *Ensuring the Long-Term Sustainability and Security of the Space Environment*, Mission of the United States Geneva Switzerland, available at: http://tinyurl.com/zladkf6
[52] Robert A. Wood, 2014.
[53] Michael Listner and Rajeswari Pillai Rajagopalan, August 11, 2014: *The 2014 PPWT: A new draft but with the same and different problems*, The Space Review: http://www.thespacereview.com/article/2575/1
[54] Michael J. Listner, October 26, 2015: *The International Code of Conduct: Comments on changes in the latest draft and post mortem thoughts*, The Space Review: http://www.thespacereview.com/article/2851/1

than multilateral allegiance. President Barack Obama clarified the universality of the US space strategy in his speech at the Kennedy Space Centre:

'Fifty years after the creation of NASA, our goal is no longer just a destination to reach. Our goal is the capacity for people to work and learn and operate and live safely beyond the Earth for extended periods of time, ultimately in ways that are more sustainable and even indefinite. And in fulfilling this task, we will not only extend humanity's reach in space - we will strengthen America's leadership here on Earth.'[55]

Even though the issues of mining rights on the moon and the US space plane were not referred to in this speech, they underline the argument. The US Commercial Space Launch Competitiveness Act passed the US Senate in 2015.[56] It allows US citizens to exploit asteroids and other space resources commercially. The term 'space resource' in this context means 'an abiotic resource in outer space' and includes water and minerals.[57] The US, as well as Russia and China, have intentionally not signed the MOON treaty, which banishes commercial mining. The incontrovertible certainty that US national law overrides international law is critical in this context. For example, there is justified concern among emerging space powers that the US might exploit mineral resources on the moon or asteroids on an industrial base. Any step in this direction would violate the general principles of the OST. Article one of the OST continues:

'*Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies' and 'there shall be freedom of scientific investigation in outer space, including the moon and other celestial bodies, and States shall facilitate and encourage international co-operation in such investigation.'*[58]

From the General to the Specific

The International Code of Conduct for Outer Space Activities, as introduced by the European Union, could have been a significant step forward for conflict prevention in outer space. The concept of conflict prevention is underrated in a global environment in which the international community far too often only acts, when a conflict has already escalated. Nevertheless, the Code would have provided an ambitious solution for an increasingly used, but under-regulated domain. However, this well intended move has been confronted by significant obstacles on many levels. First, outer space is a domain in which conflicting interests collide. National actors with ambitions in the fields of economics, national development, security and science claim outer space. Leading actors, such as the US, want to be free of restraints, Russia and China would like to contain the US, while others emphasize joint efforts in science or try to preserve the space as an environmental unit. Against this background, it is naturally difficult for any initiative to succeed.

Second, there is the question of an adequate approach. In what manner and with what kind of material does the EU address the General Assembly? The question of 'how' has turned out to be a delicate one, as the General Assembly won't let any resolution pass that has not been thoroughly negotiated within the UN framework, where every nation has the same voice. An open and truly equal process is essential at this point. Third, the international stage has already been taken by 'heavy weight' UN institutions, such as COPUOS, UNOOSA and regular conferences, such as UNIDIR or the GGE. This requires a careful balance and intensive dialogue between institutions. Otherwise, any initiative runs the risk of political blockade. Last, but not least, there is the ongoing development of the 'Guidelines

[55] Barack Obama, April 15, 2010: *President Obama's Remarks on the Space Program*, Kennedy Space Centre Florida, New York Times, available at: http://tinyurl.com/jv8whbh

[56] Elisabeth Howell, July 15, 2016: *Who Owns the Moon?, Space Law & Outer Space treaties*: Space.com http://www.space.com/33440-space-law.html

[57] U.S. Commercial Space Launch Competitiveness Act, November 25, 2015: Title IV – Space Resource Exploration and Utilization, available at: http://tinyurl.com/gpdnoke

[58] United Nations Office for Outer Space Affairs, 2222 (XXI). Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (OST).

for the long-term sustainability of outer space activities' (LTS Guidelines) by the STSC,[59] which will be discussed for the final time in the 54th session of the STSC from January 2017 on at UN COPUOS in Vienna.

The LTS Guidelines '*provide guidance to Governments and relevant intergovernmental organizations on the conduct of space operations in a manner that supports the long-term sustainability of outer space activities'.* They underline the principles laid out in the OST and demand *'States, in particular those with major space capabilities, should contribute actively to the goal of preventing an arms race in outer space as an essential condition for the promotion of international cooperation in the exploration and use of outer space for peaceful purposes.'*[60] They veto the implementation of policies '*aimed at precluding interference with the operation of foreign space objects through unauthorized access to their on-board hardware and software*,'[61] and take the risk of cyber-attacks on space assets into account: *'States should seek to prevent the proliferation of malicious information and communications technology tools and techniques and the use of harmful hidden functions.'*[62] Once established the LTS Guidelines could provide a significant step forward for regulation and conflict prevention in outer space.

Where does this leave the Code?

Although the Code addresses important aspects, the draft resembles rather a strategy paper than an agreement. The content is presented in deliberately vague wording, so that every nation can easily relate to the document. Jack M. Beard criticizes this aspect: '*However, the indeterminate language used in the Code provides neither clear rules nor a sound basis for developing a legally binding regime. Instead, such language appears to merely mask a failure by states to agree on key terms and definitions*.'[63] That is one reason why the Code has not brought the international community much closer to responsible behavior in outer space or to a binding treaty in the area of non-proliferation of critical space technologies. Especially clauses, such as *'The Subscribing states resolve to share, on an annual basis, where available and appropriate, information with the other states on: their space strategies and policies, including those which are security-related, in all aspects which could affect the safety, security, and sustainability in outer space;*'[64] are unlikely to be accepted, because of the secret nature of military security.

Practical first steps on a technical level, such as the demand for policies against the proliferation of malicious information and communication technology tools, as they were introduced by the LTS Guidelines, are far more likely to be approved by the UN General Assembly. Therefore, a comprehensive and practical approach comprising concrete demands on national policies is a far more effective step than a broad draft, which is perceived solely as a norm-setting instrument. Consequently, the Code is only a small step forward as a sound measure for conflict-prevention in outer space. But the Code is, nevertheless, a valuable contribution to the ongoing debate, because it places the right issues on the agenda of international politics.

As the Indian space expert Sidhara Murthi observes: *'Apart from such specific issues and broader principles, the multilateral process initiated has been a step in the right direction, and it may be hoped that the impasse that has ruled the field of development of further regulations relating to Outer Space will find new pathways to progress.'*[65]

[59] UN General Assembly, Committee on the Peaceful Uses of Outer Space, Scientific and Technical Subcommittee, 20 June 2016: *Guidelines for the long-term sustainability of outer space activities*, Working paper by the Chair of the Working Group on the Long-term Sustainability of Outer Space Activities, available at: http://tinyurl.com/zrft85y

[60] UN COPUOS, *Guidelines for the long-term sustainability of outer space activities*, Guideline 7.2., p. 22.

[61] Ibid. Guideline 9, p. 23.

[62] Ibid. Guideline 9.1, p. 24.

[63] Jack M. Beard, 2016: *Soft Law's Failure on the Horizon: The International Code of Conduct for Outer Space Activities*, University of Nebraska - Lincoln, p. 20, available at: http://tinyurl.com/jjzna95

[64] Draft International Code of Conduct for Outer Space Activities, Article 6.1. *Information on Outer Space Activities*, line 73.

[65] K.R. Sridhara Murthi, Chapter 28, *International Code of Conduct for Outer Space: An Industry Perspective*, in: *Decoding the International Code of Conduct for Outer Space Activities*, 2012: Pentagon Press, New Delhi, p.146.

What lies ahead?

The European Union reacted to this backlash with the establishment of a British, German, Italian troika, which, with support of the European External Service (EAD), continues to work on general principles for responsible behavior in outer space. This more inclusive initiative named PROBOS (Principles of Responsible Behavior in Outer Space), intends to submit a resolution to the 72nd General Assembly in September 2017. The EU understands the International Code of Conduct for Outer Space Activities as well as the PROBOS initiative as interim solutions and necessary first steps towards an UN legitimized International Code of Conduct, covering civilian as well as military space activities. From a vision this new International Code would merge into a binding non-proliferation agreement.

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The Interdisciplinary Research Group on Disarmament, Arms Control and Risk Technologies (IFAR²) addresses the complex interaction between the dynamics of armament, potential weapons deployment, debates on strategy as well as the potential of arms control and disarmament as security policy instruments. For further information see: https://ifsh.de/en/ifar/profile/

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ABBREVIATIONS

ARRA	Agreement on the Rescue of Astronauts and the Return of Objects into Outer Space
ASAT	anti-satellite weapon
BMD	ballistic missile defense
BRICS	the emerging national economies Brazil, Russia, India, China and South-Africa
CD	Conference on Disarmament
COC	International Code of Conduct (the Code)
CONOP	Working Group on Non-Proliferation
C4ISR	command, control, communications, computers, intelligence, surveillance and reconnaissance
DEW	directed energy weapon
EEAS	European External Action Service
EU	European Union
FMCT	Fissile Material Cut-off Treaty
GGE	Group of Governmental Experts
HCOC	Hague Code of Conduct, also International Code of Conduct against Ballistic Missile Proliferation (ICOC)
KEW	kinetic energy weapon
LEO	low Earth orbit (180-2,000 km)
LIAB	Convention on International Liability for Damage Caused by Space Objects
LTS Guidelines	Guidelines for the Long-term sustainability of Outer Space Activities
LTS Working Group	Working Group on the Long-term Sustainability of Outer Space Activities
MOON	Agreement Governing the Activities of States on the Moon and Other Celestial Bodies
NAM	Non-Aligned Movement
NATO	North Atlantic Treaty Organization
NGO	non-governmental organization
OST	Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies
PAROS	Prevention of an Arms Race in Outer Space
PPWT	Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, and of the Threat or Use of Force Against Outer Space Objects
PROBOS	EU Initiative for Principles of Responsible Behavior in Outer Space
REG	Convention on Registration of Objects Launched into Outer Space
STSC	Scientific and Technical Sub-Committee of COPUOS
TCBMs	transparency and confidence-building measures
UN	United Nations
COPUOS	Committee on the Peaceful Uses of Outer Space
UNIDIR	UN Institute for Disarmament Research
UNOOSA	UN Office of Outer Space Affairs
WMD	weapons of mass destruction