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Dark Forces Awaken: The Prospects for Cooperative Space Security

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Abstract:

International cooperation on outer space security has fluctuated over the past decades, marked by periods of common endeavor and relative stability as well as times of destabilizing developments and rising tensions. The UN Group of Governmental Experts' 2013 consensus report on Transparency and Confidence Building Measures, with its rich menu of measures and promised new levels of cooperative security conduct by states, was a diplomatic high-water mark. Regrettably, subsequent negative developments threaten to reverse the cooperative trend the report espoused. These developments include the introduction (by Russia and China) and rejection (by the US) of a revised draft treaty on the Prevention of Placement of Weapons in Outer Space (PPWT); the adoption by the UN General Assembly of a divisive resolution on "No First Placement" of space weapons; the failure of the EU to gain support for its proposed Code of Conduct; and escalating strategic tensions. This paper analyzes the reemergence of these "dark forces" as to their implication for multilateral diplomacy and suggests several remedial actions to preserve space security.

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Dark Forces Awaken: The Prospects for Cooperative Space Security

The former British Prime Minister, Harold Macmillan was once questioned by a journalist as to what matters kept him up at nights. He is reported to have replied “Events, my dear boy, events”. What is true for politics is also valid for diplomacy. External events often have the unsettling effect of imposing themselves on the carefully developed plans and timetables of diplomatic practitioners and disrupting their content. It is also a truism that no diplomacy occurs in a vacuum, it will always be affected by the general political environment in which it operates. At the same time it is the diplomat’s task to attempt to make progress towards established goals despite the vagaries of the international environment.

This paper takes as its starting point one of the most positive developments in recent years in the realm of outer space security diplomacy and contrasts this with a set of subsequent negative trends that threaten to eclipse it. The positive development was the consensus report of the UN Group of Governmental Experts (GGE) on “Transparency and Confidence-building Measures in Outer Space Activities” of July 2013.¹ This major report emerged despite a protracted impasse in consideration of outer space security issues in the responsible diplomatic forums. The “Prevention of an Arms Race in Outer Space” (PAROS) has been a standing item on the agenda of the Conference on Disarmament since 1982. The Conference, a 65 member state body in Geneva, is supposed to serve as the UN’s chief forum for the negotiation of multilateral agreements on arms control and disarmament. While the “Prevention of an Arms Race in Outer Space” item has remained on the Conference’s formal agenda an Ad Hoc Committee mandated to consider this subject only operated between 1985 and 1994. Since then and due to the overall deadlock regarding competing priorities that has paralyzed the Conference and prevented it from officially working on this or any other item on its agenda, the outer space security issue has been sidelined at the UN. Although outer space has been the subject of annual declaratory resolutions in the First (Disarmament and International Security) Committee of the UN General Assembly and half a day of thematic debate during these sessions, the fact remains that no significant action has been undertaken multilaterally specifically on the space security

theme for decades. There have been some positive developments in the context of the UN's Committee on the Peaceful Use of Outer Space (COPUOUS) most notably in 2007 with adoption of Debris Mitigation Guidelines as well as more recently agreement on several policy guidelines developed by the working group on the Long Term Sustainability of Outer Space, but these lack an explicit space security orientation.

Against this backdrop of stagnant multilateral consideration of space security, the ability of the UN GGE, after three one-week sessions under the able chairmanship of Victor Vasiliev of Russia, to agree a consensus report was welcomed as both a substantive and a diplomatic success.

Substantive in that it provided a cogent account of the purpose of transparency and confidence building measures (henceforth TCBMs) in promoting international cooperation and outer space security. The report also enumerated the chief categories of TCBMs and importantly set out criteria for developing these measures. It then proceeded to present an extensive menu of potential TCBMs and encouraged states to consider adopting such measures on a voluntary basis. At the same time, the GGE noted that TCBMs could complement, but not substitute for arms limitation and disarmament measures and the means to verify such measures.

Diplomatically, the GGE represented a success in demarcating with considerable detail, common ground for the international community in advancing shared objectives for sustaining a secure environment in outer space. This accomplishment was particularly timely in that it appeared to offer a cooperative path forward for states on the outer space file against a background of revived fears over the re-emergence of anti-satellite weapon testing by major spacefaring states a few years earlier. Indeed the GGE acknowledged that contemporary and future fears constituted a motivation for its work: "In the context of international peace and security, there is growing concern that threats to vital space capabilities may increase during the next decade as a result of both natural and man-made hazards and the possible development of disruptive and destructive counterspace capabilities".²

These concerns proved to be well founded and not long after the issuance of the GGE report "dark forces" emerged to overshadow the promise that the GGE had represented. When the rounds of applause over the GGE's success had died down, the international community was

still left with the question whether its well-crafted TCBMs are likely to be implemented anytime soon. Regrettably, the impetus for cooperative security measures in space represented by the GGE seems to have met countervailing forces that have weakened its positive impact on the space policies of states. In my view, four main developments in the post-2013 period have worked against greater take up of the GGE recommendations: i) an impasse over legally-binding constraints such as the draft treaty on the Prevention of the Placement of Weapons in Space Treaty (PPWT); ii) the breakdown of consensual approach to space-related resolutions at UNGA; iii) escalating threat perceptions and accompanying rhetoric regarding counterforce capabilities and iv) the failure to realize an International Code of Conduct as had been promoted by the EU. I will consider each of these factors in turn while recognizing that there are clear interrelationships amongst them.

Prevention of Placement of Weapons in Outer Space Treaty Impasse

The protracted impasse with respect to consideration of the Sino-Russian proposed treaty on the “Prevention of Placement of Weapons in Outer Space and of the threat or use of force against outer space objects” (PPWT) has represented a blockage in space security diplomacy that has had negative consequences all around. Not least of which is the impression that states are not willing to engage in considering and working through a draft text on a serious space security issue. The PPWT was formally tabled at the CD in 2008, although its antecedents at the CD date back to 2002 and even earlier in the UN General Assembly where a similar draft treaty was presented by the Soviet Union in 1983. After receiving some reactions from CD member states China and Russia submitted a revised version of the proposed treaty in June 2014.³ Its sponsors have repeatedly said that they would welcome further discussion of the draft, but given the lack of an agreed program of work at the CD and the concomitant absence of an Ad Hoc Committee on its PAROS agenda item, there has been no authorized subsidiary body at the CD to take up this proposal. China and Russia however have not been willing to take the draft treaty outside the CD for consideration and it remains in a form of suspended animation.

Since the tabling of the revised version the principal official action undertaken at the CD has been a critical analysis of the PPWT submitted by the United States and a rebuttal of that

criticism offered by China and Russia. The US criticism mainly focuses on the lack of verification provisions in the PPWT and its inadequate scope given its failure to cover terrestrial anti-satellite weapons (ASATs). The rebuttal argues that it is not feasible to verify a wider weapons ban, but only a prohibition on placement and the use of force at this time although it envisages the possibility of elaborating verification measures in the future. With regard to terrestrial ASATs, the rebuttal asserts that the treaty's ban on the use of force against space objects would preclude the use of such weapons and should therefore eliminate the incentive to develop and possess them. The Sino-Russian paper also hints at the major problem posed by missile defences with their inherent anti-satellite capability that would arise if an effort was made to cover terrestrial based ASATs in a treaty.

To some extent the deadlock over the PPWT has also represented a proxy battle with respect to the acceptability of legally binding arms control accords in the current geopolitical environment. The US continues to claim that "it is not opposed to space arms control agreements in principle" but it appears to be so in practice, having made no proposal of its own or endorsed any other. In his statement to the 2015 UN General Assembly First Committee debate on outer space, US Ambassador Robert A. Wood said "In contrast to the approach advocated by some States to pursue protracted negotiations to conclude a legally binding instrument, the United States is convinced that many outer space challenges confronting us could be addressed through practical, near-term initiatives, such as non-legally binding TCBMs".⁴

China and Russia for their part in proposing the PPWT reflect their longstanding preference for legally binding instruments when addressing international security issues. At the same aforementioned First Committee session that Ambassador Wood addressed, the Chinese representative called for "more convergence and start multilateral negotiations on an arms control treaty so as to effectively maintain safety and security of space". While recognizing the potential role of TCBMs as a complement to the non-weaponization of space, the Chinese delegate stressed that "given their intrinsic limitations, TCBM cannot replace the negotiation of a legally-binding arms control treaty".⁵ The fact of these sharply opposing views on the contents of the PPWT and the absence of any working body for engaging the protagonists and other parties

in an effort to reconcile these views is a significant obstacle to progress on space security and the elaboration of new multilateral agreements.

Breakdown of Consensus

One of the positive features of the international community's declaratory policy on outer space security, as evidenced by relevant resolutions at the UN General Assembly, has been the high degree of consensual approaches. The annual resolution on the Prevention of an Arms Race in Outer Space for example has had no opposing votes in recent years and only two abstentions. The resolution on TCBMs was adopted last UNGA session without a vote being required. At the 69th session of UNGA in 2014 however this pattern of consensual policy expression was broken with the introduction by Russia of a new resolution on the "No First Placement of Weapons in Outer Space". This resolution (69/32) encouraged states to adopt a political commitment not to be the first to place weapons in outer space. There was significant resistance to this resolution with some arguing that it did not meet the criteria for TCBMs that had just been arrived at by the GGE. Others thought the "no first placement" phraseology as opposed to a simple "no placement" pledge to be problematic. In an Explanation of Vote on behalf of the EU it was stated that the resolution "could be interpreted as implicitly encouraging States to pre-emptively develop offensive space capabilities, in order to be able to react to the placement by another State of a weapon in space".⁶

Despite these misgivings the resolution sponsors did not offer up any modification to the text and pressed on to a vote with the predictably divisive results of 126 in favour, 4 opposed and 46 abstaining.

At the General Assembly's 2015 session the same resolution (70/27) was again adopted with a sizeable minority of states not supporting it. Regrettably this has introduced a discordant element into the generally consensual approach that has characterized UNGA's pronouncements on space security.

The convening, at the same 70th session, of the first joint meeting of the First and Fourth Committees (the General Assembly Committees responsible for the international security and

peaceful use dimensions of outer space respectively) while symbolically desirable in bridging the institutional divide on space did not generate any practical outcome to help span the policy fissures revealed. In addressing the meeting, the chair of the GGE, Ambassador Victor Vasiliev acknowledged that his group had expressed doubts as to the follow-up that would be accorded to their report. He stated: “When our group was working on the recommendations we also had doubts whether the report would serve its purpose or would be just another file in the archive?”⁷ Ironically the origin of this first joint meeting lay in a recommendation from the report of the GGE, perhaps the only recommendation of the GGE actually implemented by UN member states to date.

Some observers will point to the agreement this summer at COPUOUS to adopt 12 of 28 proposed guidelines generated by the working group on the Long-term Sustainability of Outer Space as representing progress in implementing the GGE recommendations. The GGE was careful however not to conflate the guidelines being discussed in COPUOUS with the TCBMs it was espousing. The troubled history in achieving consensus on the initial set of guidelines and the fact that the working group’s timeline has been extended by two years for addressing the majority of guidelines that remain outstanding, suggests that even this more “technical” effort at consensus building on space policy remains problematic.

It is noteworthy that the International Committee of the Red Cross, the guardian of international humanitarian law (IHL), saw fit to include for the first time a section on outer space in its statement to the 2015 session of the General Assembly’s First Committee. The statement affirms that “any hostile use of outer space in armed conflict...must comply with IHL” although “by asserting that IHL applies to outer space warfare, the ICRC is in no way condoning the weaponization of outer space, which recurring resolutions of the General Assembly have sought to prevent.”⁸ The ICRC’s decision to include the issue of outer space warfare in its statement suggests a heightened concern by that organization with respect to current trends in outer space security.

Escalating Threat Perceptions

Another troubling theme in recent years has been the escalation of threat perceptions and allegedly of weapon development programs aimed at deploying counterspace capabilities. Indicative of this trend was the US Director of National Intelligence's recent global threat assessment, which stated "Threats to our use of military, civil, and commercial space systems will increase in the next few years as Russia and China progress in developing counterspace weapon systems to deny, degrade, or disrupt US space systems".⁹ If this was not disturbing enough, under a "Destroy" sub-heading the DNI stated "Russia and China continue to pursue weapons systems capable of destroying satellites on orbit, placing US satellites at greater risk in the next few years".¹⁰ In this context specific reference is made to China progressing on "the antisatellite missile system that it tested in July 2014".¹¹

Chinese activity including a May 2013 "scientific mission" launch that almost reached geo-stationary orbit range has contributed to what has been described as "quiet panic" within the US national space security community". In particular the US intelligence community was alarmed over what it perceived as Chinese ASAT testing that would threaten the hitherto sanctuary of geo-stationary orbit where key intelligence satellites reside.¹²

Whatever the reality of these military space programs, and generally this is an area of activity that could benefit from greater transparency, the ratcheting up of threat-rhetoric can fuel incipient arms racing to the detriment of outer space security. The depiction of an outer space situation where "Today our adversaries perceive that space is a weak-link in our deterrence calculus" and it is thus necessary "to disabuse our adversaries of the idea that our space capabilities make tempting targets" can be seen as provocative and projecting an offensive intent on other spacefaring states.¹³ Official depictions of the space security situation in this negative light can prompt demands for building up counterspace capabilities of one's own.¹⁴ Such heightened threat perceptions and the expanded programs to counter these threats can detract from or even displace diplomatic efforts to foster international space cooperation. They can also be readily seized upon by other states to justify military buildups of their own and perpetuate a classic "security dilemma" situation in a strategically vital environment.

Failure of International Code of Conduct Proposal

Many observers of outer space diplomacy had high hopes regarding the EU-initiated proposal for an International Code of Conduct (ICoC) to cover outer space activities.

This set of measures, some re-packaged some newly minted, represented an effort (in the words of the preamble) “to safeguard the continued peaceful and sustainable use of outer space for current and future generations”.¹⁵

The proposal was first put forward in 2008, motivated in part by a concern over the revival of ASAT activity in the preceding months and by the desire to display a tangible product of the Common European Security and Defence Policy. The process of consulting on and refining the text proved, however, to be a lengthy and uneven one. Personnel changes in the Non-proliferation and Disarmament section of the European External Action Service also appeared to impede the diplomatic management of the initiative.

The tempo and extent of consultations markedly increased in the 2013-2014 timeframe with expanded multilateral consultations held in Kiev in May 2013, in Bangkok in November 2013 and in Luxembourg in May 2014. On the basis of these meetings the EU sponsors clearly felt that the ICoC was ready to move into a final round of multilateral negotiations prior to concluding the text. The meeting the EU convened in New York, July 27-31, 2015, to this end failed however to produce the desired outcome. Significantly, it revealed a major disagreement amongst participants as to the basic process and auspices appropriate to this enterprise. In particular, dissent came from the BRICS grouping of states (Brazil, Russia, India, China and South Africa) which issued a joint statement stipulating that “the elaboration of such an instrument should be held in the format of inclusive and consensus-based multilateral negotiations within the framework of the UN, based on a proper and unequivocal mandate, without specific deadlines and taking into account the interests of all States”.¹⁶

The EU voiced its disappointment that negotiations to finalize the text of the ICoC had proven impossible after so much preparation. Tellingly however the EU did not decide to try and seek a new UN-mandate for an open-ended negotiation process at the fall 2015 session of the UN General Assembly, even though the Chair’s Summary of the July meeting suggested that course

of action. In his remarks to the First Committee during its thematic debate on outer space in October, 2015 at the 70th UNGA session, Jacek Bylica, the EU's Special Envoy for Non-proliferation and Disarmament suggested that the EU had done its bit and was now seeking support from others in deciding the fate of the ICoC proposal. He stated: "We regret that negotiations could not commence after so many years of consultations, but we are confident that the rich and substantial discussions in New York both on the substance and on the process will help the international community to move forward".¹⁷

The United States, a persistent if tepid backer of the EU ICoC initiative seems to hold out some hope that the project will be taken up again by the EU. A senior State Department official with responsibility for the space file indicated that: "We understand that the European Union continues to discuss next steps on the Code. The international community is certainly in agreement that the space environment is at risk today from challenges arising from natural and man-made hazards".¹⁸ Despite this expression of faith in EU leadership and the need to respond to space security threats, the path ahead for ICoC looks murky. While there are non-governmental voices within the EU calling for member states "to keep the ICoC on the table and under discussion at the UNGA" it is unclear whether the EU will continue to lead on the initiative.¹⁹ At present an external observer might describe the ICoC as being in a state of diplomatic limbo with no official champion committing to take the proposal forward. From a practical perspective the failure of the July 2015 meeting has had the effect of tossing cold water on what had appeared to be a promising diplomatic initiative on behalf of sustainability and security in outer space.

What Now?

I do not want to conclude this essay on a pessimistic note, but realism dictates that stakeholders in the secure use of outer space take cognizance of the negative trends of recent years and formulate strategies in that light. Remedial action to promote cooperative security approaches in outer space is needed and stakeholders in the private sector and civil society should not be passive bystanders to these events, but advocates for responsible state conduct. In

my opinion, there are four near term steps that could be taken that would help restore a more positive atmosphere for outer space security diplomacy.

New legal instruments for space arms control:

China and Russia, as the chief sponsors, should move beyond the moribund Conference on Disarmament and seek another forum to initiate discussion of their proposed PPWT and legally-binding arms control in space generally. This could be arranged through either an existing or an ad hoc mechanism, but it would permit discussion of the important factors of definitions, scope and verification that have not to date had an adequate airing in a multilateral context. To maximize participation such an examination should be constituted as a generic discussion of the issues raised by any new international legal instrument for space arms control, although the PPWT could feature as a leading example of such a treaty. While it would be desirable that such a meeting should be held in a diplomatic context it could also benefit from the participation of civil society/academic experts.

Exercise strategic restraint:

States should practice strategic restraint in their military space programs, offer greater transparency as to their nature and generally “cool” the threat rhetoric in their public utterances. There should be a conscious decision by leading space powers to engage in de-escalatory commentary on space developments and highlight areas for international cooperation. Some well-publicized exercises in transparency would be advisable. Invitations to observe launches and/or visit relevant facilities pursuant to the letter and the spirit of the Outer Space Treaty would help reduce misperceptions and boost confidence in the possibility of sustaining a peaceful space environment. The scientific, private sector and civil society could all play constructive roles alongside governments in renewing a cooperative ethos for outer space activity.

It would also be constructive if there were other specific space security proposals on the multilateral table for consideration. Whether in the form of a political TCBM or as a legal instrument, a moratorium or ban on destructive ASAT testing would for example represent a positive input to the current debate if a state or states could champion it.

Take forward the International Code of Conduct proposal:

After eight years of effort, it would be a shame if the ICoC idea disappeared from the diplomatic arena. Like any proposal there were undoubtedly elements of the draft text that could be improved upon. It represented however a promising set of TCBMs in line with the recommendations of the 2013 GGE. Especially innovative was the ICoC's provision for institutional support. The type of regular meetings of subscribing states, of structured information exchange and a form of secretariat envisaged in the ICoC are all elements that have been sorely lacking under the existing multilateral regime for outer space. A representative group of states should initiate a process soon at the UN General Assembly, to establish an open-ended working group to elaborate an International Code of Conduct on outer space activities. EU states could be part of such an effort, but it would be desirable for them to include interested states from other regional groupings to optimize support for the undertaking. Putting a renewed negotiation firmly under UN auspices would remove the grounds for the opposition of the NAM and BRICS groupings to the previous process and ensure that any ICoC emerging from such a negotiation would have the appropriate standing in the international community.

Re-establish common ground and celebrate our success:

A conscious effort should be pursued to re-establish common ground amongst all states concerning the global regime governing outer space. The vision of outer space as “the province of all mankind” the use of which should be “for peaceful purposes” and “shall be carried out for the benefit and in the interests of all countries” needs to be reaffirmed in the face of the “dark forces” that are currently gathering. Readers will probably recognize in the above citations some of the key tenets of the Outer Space Treaty of 1967. This major treaty, which accorded outer space, the special status of a ‘global commons’ beyond any national appropriation still provides the foundation of the politico-legal regime for outer space. States should re-dedicate themselves to carrying out the purposes and provisions of the Outer Space Treaty.

Next year affords an important opportunity for the international community to undertake such a re-dedication. In October 2017, the Outer Space Treaty's 50th anniversary will occur. It would be fitting to convene the first ever meeting of its states parties. As an early post World War II international agreement, the Outer Space Treaty did not contain provision for any meeting

of its states parties: a norm of contemporary multilateral accords. Accordingly its 104 states parties have never officially met. To arrange for this meeting would be more than an appropriate celebration of a landmark treaty in the development of peaceful international cooperation. Such a gathering could help consolidate support for the vital obligations enshrined in the Outer Space Treaty and provide an occasion to consider how the cooperative regime it sets out can be consolidated and reinforced in the future. In the lead-up to a 50th anniversary commemorative meeting a new push towards universalization of the treaty could also be launched to further enhance its authority within the international community.

Conclusion

The 2013 UN GGE report on TCBMs represented a high-water mark of sorts in terms of multilateral cooperation on outer space security and sustainability. Its substantial menu of proposed measures, however, has not been drawn upon by states in adopting TCBMs. The period subsequent to the GGE report's release has been marked by several negative developments that have had the effect of impeding rather than facilitating international cooperation on outer space security. It is time for concerned states and engaged stakeholders to undertake remedial action if the Outer Space Treaty's vision of a peaceful outer space used for the benefit of all is to be preserved.

Notes

¹ *Group of Governmental Experts on Transparency and Confidence-building Measures in Outer Space Activities* UN General Assembly, A/68/189, 29 July 2013.

² *Ibid* p 9.

³ "Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects" CD/1839 29 February 2008 and CD/1985 12 June 2014. Available at www.unog.ch/disarmament.

⁴ Statement by Ambassador Robert A. Wood, Delegation of the United States of America, 70th UNGA First Committee, Thematic Discussion on Outer Space, October 23, 2015. Available at www.reachingcriticalwill.org.

⁵ Statement by the Chinese Delegation at the Thematic Discussion on Outer Space at the First Committee of the 70th Session of the UNGA, 23 October 2015. Available at www.reachingcriticalwill.org.

⁶ EU Explanation of Vote delivered by Italy, 69th UNGA First Committee , October 30, 2014. Available at www.reachingcriticalwill.org.

⁷ Statement by Ambassador Victor Vasiliev, Chair of the GGE on TCBMs in Outer Space Activities at Joint Ad hoc meeting of the First and Fourth Committees of the 70th session of the UN General Assembly, October 22, 2015.

⁸ Statement by the International Committee of the Red Cross to First Committee, UN General Assembly 70th session, October 15, 2015 (www.icrc.org).

⁹ “Worldwide Threat Assessment of the US Intelligence Community” Statement by James R. Clapper, Director of National Intelligence to the Senate Armed Services Committee, February 9, 2016, p 9. Available at www.armed-services.senate.gov.

¹⁰ *Ibid* p 10.

¹¹ *Ibid* p 10.

¹² Theresa Hitchens and Joan Johnson-Freese, *Toward a New National Security Space Strategy: Time for a Strategic Re-balancing*, Atlantic Council Strategy Paper 5, June 2016, p 3. See also Jeffrey Lewis “They Shoot Satellites, Don’t They?” *Foreign Policy* August 9, 2014.

¹³ Statement of Douglas Loverro, Deputy Assistant Secretary of Defense (Space Policy) to the Subcommittee on Strategic Forces, House Armed Services Committee, March 15, 2016 pp 3-4.

¹⁴ See for example the Hudson Institute’s study *Space and the Right to Self Defense* June 2016 which advocates for the US to deploy a space-based interceptor capability: “A SBI capability would enable the United States to defend against missile threats to the US homeland, allies and deployed forces, and address the direct-ascent anti- satellite threat, thus protecting our critical and unacceptably vulnerable space assets.” p 21 (www.hudson.org).

¹⁵ “Draft International Code of Conduct for Outer Space Activities” 31 March 2014. Available at www.eeas.europa.eu/non-proliferation-and-disarmament/pdf/space_code_conduct_draft_vers_31-march-2014_en.pdf.

¹⁶ BRICS Joint Statement Regarding the Principles of Elaboration of International Instruments on Outer Space Activities, New York, July 27, 2015. Available at www.reachingcriticalwill.org.

¹⁷ Statement by Mr. Jacek Bylica, Principal Adviser and Special Envoy for Non-proliferation and Disarmament, European External Action Service, UNGA 70th Session, First Committee Thematic Discussion on Outer Space, United Nations, New York, 23 October 2015. Available at www.reachingcriticalwill.org.

¹⁸ Remarks by Ms. Mallory Steward, Deputy Assistant Secretary of State for Emerging Security Challenges to *Arms Control Today* , Vol 46, No 2, March 2016 p 5.

¹⁹ Massimo Pellegrino and Gerald Stang. *Space Security for Europe*, Institute for EU Security Studies, Report #29, July 2016, p 85.