and responsive measures. The fields of action to be included in this process involve

- awareness (strategic analysis and anticipation, raising political awareness),
- preparedness ("seismographs" and emergency plans, raising the population's awareness),
- active countering (addressing weak points and eliminating vulnerabilities, networking security structures).

Based on a broader understanding of a counter-strategy, long-term efforts must aim at using opportunities created by hybrid approaches and strategies for national campaign planning and employing networked approaches when actively pursuing and advancing own interests in the field of security policy.

At the same time the potential comprehensiveness and impact of a future campaign also emphasize that countering hybrid threats cannot be an isolated national effort. While there is an obvious need for a stronger nexus between national aspects of internal and external security and the focus of the national security debate should progressively shift away from operational areas like Afghanistan and Iraq and more towards existing (and future) domestic vulnerabilities, the international dimension must not be overlooked. Indeed, the growing global complexity and interdependency positively forces Western states to the widest possible cooperation and coordination in the field of security. This includes especially a better and pro-active information exchange on potential and rising threats and possible hybrid actors, the development of common (European/transatlantic) counter-strategies, early warning systems and contingency plans as well as joint interdisciplinary efforts in the field of future technology assessment.

Space and Security – Challenges for Europe

Nina-Louisa Remuss*

Abstract: The basic idea behind the European integration process was to establish peace and security through economic integration. Once a common understanding of "peace" and "security" had been established, the necessary instruments for providing security had to be found. Among these instruments are space applications, which are increasingly relied upon in Europe and which have come to contribute to the development of a certain European role and identity among the other actors. Europe is building up its own capacities and related governance structure. This article is meant to provide the introductive facts by outlining the current developments in the context of space and security and highlights the challenges for Europe.

Keywords: Space security, code of conduct, Space Situational Awareness, Responsive Space, transtatlantic cooperation
Weltraumsicherheit, Verhaltenskodex, Space Situational Awareness, Responsive Space, transatlantische Kooperation

1. Space and Security vs. Space Security in the post-Cold War era

In the post-Cold War realm one can observe two changes when speaking about space and security. The first is more generally linked to a change in the definition of security as a result of the changing nature of threats to security, from traditional state-to-state territorial attacks to non-traditional so-called functional threats coming from non-state actors sometimes even from within the own state's boundaries.[1] It is now commonly distinguished between external and internal security. Given the need for innovative tools, space applications are increasingly used as instruments in the provision of security.

The second change is connected to space systems in particular. With the end of the Cold War, the bi-polar hegemony of the two superpowers ended and more and more states enter space, making outer space an ever more contested environment. At the same time the dependence on space applications for the functioning of society increases. Satellites provide telephony, real time broadcasting (e.g. Olympics, world cup coverage), video conferencing, faster, more secure banking and financial transactions. They are also bridging the regional and digital divide by providing broadband internet access and allow, for example, for e-learning in rural areas. European Union external security missions such as the EU Military Crisis Management Operations EUFOR Chad / RCA rely (and depend) on satellite communication for secure communications between the Operations Headquarters (OHQ) and field deployments and on satellite imagery for mapping in support of the mission. Research is also conducted in relying on space applications for internal security missions such as border- and transport security as well as for critical infrastructure protection.

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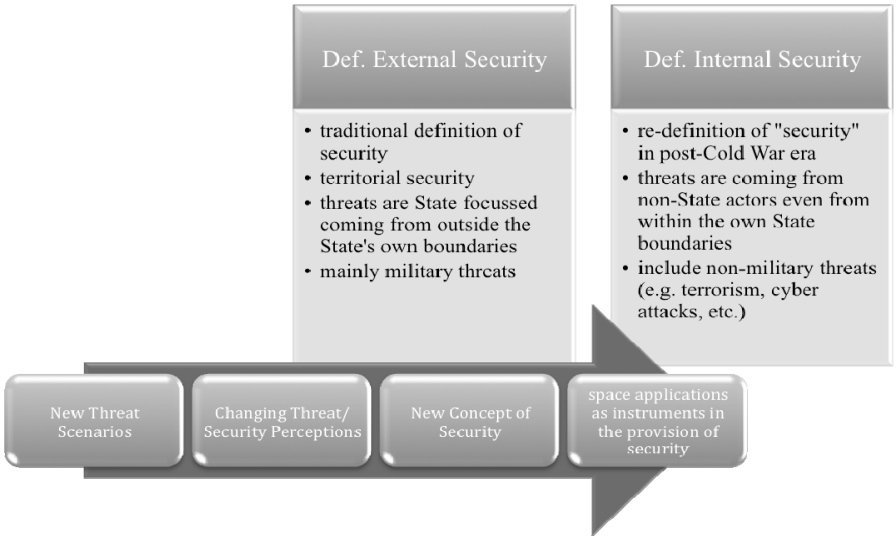
1 For a detailed account on the development of the concept of security consider Sundelius, Bengt. "Disruption – Functional Security for the EU." Disasters, Diseases, Disruptions: A new D-drive for the EU. Chaillot Paper No. 83. Ed. Antonio Missiroli. Paris: Institute for Security Studies, 2005; Varwick, Johannes and Woyke, Wichard. NATO 2000. Transatlantische Sicherheit im Wandel. Augsburg: Leske + Budrich, 1999. 30-1; Varwick, Johannes and Woyke, Wichard. Die Zukunft der NATO. Transatlantische Sicherheit im Wandel. 2nd Edition. Augsburg: Leske + Budrich, 2000. 127.

Figure 1: The development of the term „security" in the post-Cold War era



Geospatial intelligence products[2] provided by the European Union Satellite Centre (EUSC) are used in the counter-piracy mission EU ATALANTA NAVFOR. This increasing reliance on space applications for the provision of both internal and external security further adds to the increasing dependence on space applications.

Space security, generally understood as being concerned with man-made or natural threats to space assets, has become critical to the well-being of humanity, due to the heavy reliance of modern societies on space vehicles and their applications. The concept of space security is supported by governments as well as by those sectors of industry and business that are investing heavily in space. This is why a number of initiatives to ensure space security have been put forward over the years, in particular with a view to prevent the 'weaponisation' of space or an arms race in space. As a first reminder of this dangerous balance and the vulnerability of space systems, the Chinese Anti-Satellite Test (ASAT) of January 2007 shocked the international community. It was shortly followed by the U.S. interception of a supposedly falling satellite in February 2008.

Considering this, one can conclude that when speaking about space and security one can refer to two interconnected issues: (1) the provision of security on earth through space applications, and (2) space security, i.e. security of space assets and the prevention of an arms race in outer space.

Having highlighted the general background, this article is meant to provide the introductive facts by giving an overview of the current developments in the context of space and security. It will shed light on the existing documents, the current main actors, the question of governance and the European capabilities. By characterising the European approach, an overview of the transatlantic relations and NATO will be given. The final section will enumerate some open questions, yet to be solved.

2. Introductive Facts

2.1 Space and Security under Lisbon

While the Lisbon Treaty establishes space for the first time as a "shared competence" (Part 1, Title I, Art. 4, Paragraph 3 Consolidated Version of the Treaty on the Functioning of the European Union and Article 189 of the Treaty of the

Figure 2: Changes in the space environment in the post-Cold War realm

2 For a detailed description on geospatial intelligence consult the website of the European Union Satellite Centre (EUSC) <http://www.eusc.europa.eu/index.php?option=com_content&task=view&id=8&Itemid=16>; or Remuss, Nina-Louisa. "Space and Internal Security – Developing a Concept for the Use of Space Assets to Assure a Secure Europe." ESPI Report 20. Vienna: ESPI, 2009. 29-47.

Functioning of the EU)[3], security stays in the realm of the member states (Art. 4, Title I of Consolidated Version of the Treaty on European Union and Part 1, Title I, Art. 3, Paragraph 1 Consolidated Version of the Treaty on the Functioning of the European Union). These two provisions have to be properly balanced. The Lisbon Treaty further introduces the new office of the "High Representative (HR) of the Union for Foreign Affairs and Security Policy". This office's role with regard to space still needs to be clarified.

2.2 Current main actors dealing with security

The Council of the European Union is the main political authority at European level for security matters. The European Parliament (EP), as the only elected body within the EU's institutional setting, is often consulted by the Council in matters related to security and crisis management. The EP can provide recommendations or ask for clarifications from the Council. In fact the EP has recently shown growing interest in space and its applications in the security context. Its involvement seems to depend on the policy area. While so far none of its groups or committees seems to have dealt with the area of internal security the EP has issued several resolutions related to maritime policy, piracy and the situation in Somalia such as the Resolution of 20 May 2008 on an integrated maritime policy for the European Union (T6-0213/2008). Its resolution on space and security (2008/2030(INI))[4] of 10 July 2008 acknowledged the potential of the EUSC for ESDP missions and called for ensuring complementarity with GMES (Global Monitoring for Environment and Security) observation capacities. Several groups and committees of the EP touch upon space and security when dealing with subject areas such as maritime security. Some Parliamentary Committees are of particular relevance for space and security, such as the Subcommittee on Security and Defence (SEDE) within the Committee on Foreign Affairs. Together with single parties they discuss specific subjects and organise workshops. The involvement of the EP in space and security matters could be increased.

Based on its cooperation with ESA, the European Commission (EC) is involved in the two European flagship projects in space, namely the Galileo satellite navigation system and GMES. Especially GMES holds a potential for security related applications. The EU also invests in space research and development within the scope of the Seventh Framework Programme for Research, Technological Development and Demonstration Activities (FP7). This programme earmarks EUR 1,43 billion for the funding of space- related research for the period from 2007- 2013. In the scope of the FP7 Cooperation Programme there are also considerable funds foreseen for security research. The involvement of the EU agencies and DGs depends on the policy areas.

The European Union Satellite Centre (EUSC) facilitates decision making for crisis management by providing products resulting from the analysis of satellite imagery and collateral data, and related services. Its mandate is currently limited to "support[ing] the decision-making of the European Union in the field of the Common Foreign and Security Policy and in particular the European Security and Defence Policy, including European Union crisis management operations."[5]

Figure 3: Example of an EUSC Geospatial Intelligence Analysis in the search for pirate bases[6]

The European Defence Agency (EDA) aims at promoting EU armament cooperation, strengthening the EU's defence industrial and technological base and creating a competitive European defence equipment market. The agency also promotes research, with a view to strengthening Europe's industrial and technological potential in the defence field. EDA engaged in the so-called "Structured Dialogue on Space" with the European Commission, the Council General Secretariat, the European Space Agency (ESA) and member

3 Also consider the related Commission Information Note: Commission of the European Communities. Article 189 of the Treaty of the Functioning of the EU. Information Note HSPG/22-2009 of 1 Dec. 2009. Brussels: European Communities; Sánchez Aranzamendi, Matxalen. "Space, an EU shared competence. It's more than Art 189 TFEU." Presentation. Policy Challenges for a Single European Space – Results and Perspectives from the Spanish EU Council Presidency for European Space Policy and Programmes. ESPI, Vienna, Austria. 23 June 2010. <http://www.espi.or.at/images/stories/dokumente/presentations2010/spanish%20presidenc%20evening%20event.%2023.06.2010.pdf>.

4 Find the full text here <http://www.europarl.europa.eu/meetdocs/2009_2014/documents/ta/10/07/2008%20-%200365/p6_ta-prov(2008)0365_en.pdf>.

5 "Mission." European Union Satellite Centre. 22 Jun. 2010 <http://www.eusc.europa.eu/index.php?option=com_content&task=view&id=3&Itemid=11>.

6 Wilson, Andrew. "EUSC Support to Op Atalanta." Presentation. Space and Maritime Security – Strategies and Capabilities to Counter Piracy. Wirtschaftskammer Österreich, Vienna, Austria. 30 November 2009.

states, aimed at raising awareness about programmes and identifying opportunities for the complementary development of space-based assets for respective user communities. In this context, valuable interfaces have been created with other key players. The European Commission's activities within the FP 7 in areas such as space and security research are of high interest to EDA participating member states. In this context, the cooperative European Framework Initiative was formed in April/May 2009, creating joint programmes and committees that might build the bridge between FP 7 and FP 8. EDA is also involved in developing the defence-related requirements for Space Situational Awareness (SSA) and other ESA projects. Regarding research and technology, EDA has formed a Joint Task Force together with the European Commission and ESA on critical technologies for European non-dependence. It is also exploring future activities in support of space, system of systems and simulation/modelling. With a view to a more structured approach, on 18 May 2009 Ministers of Defence tasked the Agency to propose a framework for maximising such complementarities and synergy between defence and civilian security-related activities and to propose the content of a coordinated programme. Equally EDA investigates possible synergies and military requirements as to the GMES programme. Regular exchange is also taking place with the European Space Agency, whose space-related technology and application programmes bear a similar potential for coordination and synergies. Common areas of interest currently range from the definition of military requirements for security-relevant programmes such as Space Situational Awareness and possible interest in the European Data Relay Satellite System to the conduct of coordinated feasibility studies regarding the demonstration of Unmanned Aerial Systems (UAS) Command and Control over Satellites. The "Structured Dialogue" needs to be further put into practice and the development of a more comprehensive European agenda fostered.[7]

ESA, as an international organisation, is the space agency of Europe. It can be understood as Europe's management and technology development agency. There are a number of ongoing ESA activities that have a security dimension, although they were not specifically designed to account for security requirements. Examples include the ENVISAT and ERS-2 missions, whose data are supplied to the EUSC. ESA also supports the International Charter on Space and Major Disasters and it has initiated activities with the International Atomic Energy Agency (IAEA) for monitoring critical infrastructures. Regarding GMES and Galileo, ESA had already been engaged in these programmes as a result of its cooperation with the European Union, which is one of the main users of space applications. In the domain of GMES, for example, ESA had launched the RESPOND and the MARISS projects. In the future, ESA will contribute heavily to GMES, for example via existing satellites and the planned Sentinel missions.

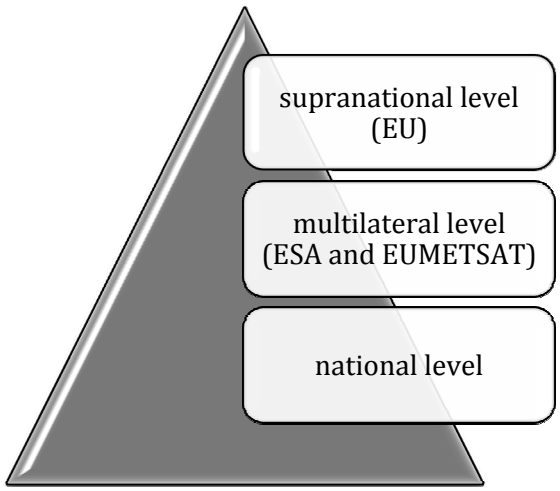
EUMETSAT (European Organisation for the Exploitation of Meteorological Satellites) provides its members and cooperating states with weather-related earth observation data and services. A major part of EUMETSAT data goes to defence-related institutions. Currently, EUMETSAT operates a fleet of two generations of geostationary weather satellites and several polar orbiting satellites. Meteorological data from polar satellites are of particular strategic importance. In many states, weather data are perceived as critical to public security and technical safety. Accordingly, meteorological satellites can be considered as a critical infrastructure.

In line with the Lisbon Treaty, member states of the EU with their respective national space agencies remain the dominant stakeholders for matters of security and defence. Most relevant space systems are at national level with different constituency for European Union and ESA.[8] These existing systems at member state level are optimised for national requirements and still need to be optimised at the European level.

2.3 Governance

Space activities in Europe are carried out by multiple actors at different levels: (1) the overall European level with the EU (supranational level); (2) the intergovernmental organisations, e.g. ESA and EUMETSAT (multilateral level); and (3) the member states' level with the national space actors (national level).

Figure 4: Three levels of space activities in Europe



As a result Europe is faced with dispersed responsibilities. There is thus the need to advance the structured dialogue among the relevant entities as foreseen by the European Space Policy (ESP). Furthermore, member states often cooperated in security-related space activities outside European Union structures, risking a duplication of efforts. All security-related space activities should thus be integrated into a coherent European system. In addition, ESA has recently become

7 Trioulaire, Denis and Michael Simm. "European Cooperation on Space Matters." EDA Bulletin. Issue 12. June 2009. 17.

8 For a detailed description of the involvement of these actors in the area of internal security, the fight against piracy and the peaceful uses of outer space discussion consult the draft code of conduct: Remuss, Nina-Louisa. "Space and Internal Security – Developing a Concept for the Use of Space Assets to Assure a Secure Europe." ESPI Report 20. Vienna: ESPI, 2009; Remuss, Nina-Louisa. ESPI Report 26 on the use of space applications in the fight against piracy. Vienna: ESPI, 2010 (forthcoming); Rathgeber, Wolfgang, and Nina-Louisa Remuss. "Space Security – A Formative Role and Principled Identity for Europe." ESPI Report 16. Vienna: ESPI, 2009.

involved in security-related space activities (e.g. GIANUS[9]). These endeavours need to be coordinated with the security community. Clear-cut interfaces need to be designed. Also the cooperation with other international organisations like OSCE and NATO is still minor, calling for an increasing dialogue and cooperation and taking advantage of the new (post-Lisbon) institutional setting (e.g. HR of Foreign Affairs and Security Policy).

2.4 Capabilities

In 2001, the first step towards identifying the European capabilities was undertaken, when the European Council of Laeken launched the European Capabilities Action Plan (ECAP)[10], based on the principles of enhanced effectiveness and efficiency of European military capability efforts, a bottom-up approach to European defence cooperation, coordination between EU member states and cooperation with NATO and the importance of broad public support. The ECAP involved some twenty panels consisting of member states' military experts putting forward proposals and suggestions regarding deficiencies and potential solutions. Following up on monitoring and closing of the potential gaps is essential in order to advance the European assets.

Several EU research initiatives have looked into how space as an instrument can support security policy and missions both internally and externally: the EU's Framework Programme for Research and Technological Development (FP), the Security Panel of Experts (SPASEC) and its subsequent SPASEC-Report, the Group of Personalities (GoP) for Security Research, the European Security Research Advisory Board (ESRAB) and the European Security and Research Innovation Forum (ESRIF). They have given insights into existing capabilities and the improvements needed. Additionally, several think tanks have looked into European approaches to security. These include the Belgian Royal Institute for International Relations initiative, which proposed a European security concept for the twenty-first century, and the EU Institute for Security Studies (EUISS) that put forward suggestions for Europe's ambitions for European defence in 2020. While not directly dealing with the use of space applications in the provision of security, these attempts have aimed to answer questions, such as the EU's relationship with NATO and the question of parliamentary oversight over the EU Common Security and Defence Policy.

As has been indicated earlier, many space applications feature dual-use character. This was among other things one of the conclusions of the Group of Personalities (GOP) in the field of security research. Recognising space as a "force enabler", the GOP concluded that security and civil applications are increasingly forming a continuum with challenges inside and outside the EU often being similar. Across this continuum, applications in one area can often be transformed into applications in another area. Space is a prime example for such developments.[11] There is thus the need to exploit the corresponding synergies to achieve maximum efficiency.

Given that key capabilities are held by the member states, comprehensive mapping with a view to making the abilities available to other states and Europe as a whole (cf. MUSIS) is of utmost importance. In some areas such as in maritime surveillance progress[12] in this regard has already been made, yet these sectoral status reports need to be integrated as to provide a comprehensive picture of existing capabilities and to be able to conduct a thorough gap analysis.

It is further possible to identify different processes for consolidating civilian and military requirements. There is the need to feed both requirements into the definition of dual-use systems. In this context the roles of the institutional actors, ESA, EC and EDA, need to be further clarified also with an eye to making space applications in general more responsive[13].

There is currently no European Space Situational Awareness (SSA)[14] capability. At the moment Europe thus totally depends on the U.S. for this purpose. Led by ESA, European efforts to establish a SSA system have started in January 2009 (cf. ESA's SSA Preparatory Programme). In line with its threefold objective (to help protect European space systems and ground infrastructure against space debris, harmful space weather and potential impacts), SSA consists of three major segments: Space Surveillance & Tracking, Space Weather and Near-Earth Objects. The system is to be set up for multiple uses, implying that it has been developed to serve different user communities (e.g. civilian and military) right from the beginning. The preparatory phase includes designing the overall structure, defining the data and governance policy, establishing data centres and management systems and, in parallel, launching precursor services based on existing (federated) European assets. SSA is also developing a test prototype of a European space surveillance radar. The preparatory programme extends over three years.[15] The European SSA is envisaged as a user-driven system. It thus needs to be ensured that all stakeholders, especially commercial ones such as satellite operators, are involved.

Space Applications are increasingly used in support of EU external crisis support missions such as "EUFOR Chad / RCA". Geographical considerations were a major determining

9 Global Integrated Architecture for iNnovative Utilisation of space for Security. For further information cf. Duhamel, Erwin. "ESA and Security an Involving Commitment." Presentation. Italy, Frascati: 2009. <http://dup.esrin.esa.it/Files/News/3.Duhamel.pdf>.

10 For the full text consult the website of the Council of the European Union <http://www.consilium.europa.eu/uedocs/cmsUpload/European%20Capability%20Action%20Plan%20-%20Excerpt%20Press%20Release%20November%202001.pdf>.

11 Group of Personalities in the field of Security Research. "Research for a Secure Europe: Report of the Group of Personalities in the field of Security Research." Luxembourg: Group of Personalities, 2004. 9.

12 Cf. For example European Commission/ Joint Research Centre, Ispra. Integrated Maritime Policy for the EU: Working Document III – On Maritime Surveillance Systems. 14 June 2008. Ispra. <http://ec.europa.eu/maritimeaffairs/pdf/ maritime_policy_action/maritime-surveillance_en.pdf>.

13 For an overview of the challenge to make space applications in Europe more responsive consult Remuss, Nina-Louisa. "Responsive Space for Europe – Elements for a Roadmap for Europe based on a comparative analysis with the U.S. Operational Responsive Space Concept." ESPI Report 22. Vienna: ESPI, 2010.

14 According to the definition of a potential SSA user group gathered by ESA, SSA consists of understanding and maintaining awareness of the earth's orbital population, the space environment, and possible threats.

15 For further information on Europe's approach to SSA consult Rathgeber, Wolfgang. "Europe's way to Space Situational Awareness (SSA)." ESPI Report 10. Vienna: ESPI, 2008; also check ESA's section on SSA for recent developments <http://www.esa.int/esaMI/SSA/index.html>.

factor in the kind of support that space applications could provide for this mission, which was characterised primarily by the lack of supporting infrastructure in the host country and the particularly large area of operation. Due to the great distances between the Operations Headquarters (OHQ) and field deployments, the mission totally depended on SatCom. However, the set-up of secure communications with high bandwidth proved to be timely and costly. Security could often not be guaranteed due to reliance on commercial satellites and the risk of interception by adversaries.[16] Satellite imagery was used for mapping in support of the mission. France contributed the SPOT-5 satellite pictures for geographic reference and enabled specific products such as traffic mapping, while the EUSC developed geospatial contingency support packages. In this imagery intelligence, the timeliness of service delivery is crucial as it might be the only possibility to validate information and situations provided by other sources. While the EUSC Imagery Analyst (IA) was able to deliver his analysis based on fast acquisition of earth observation data, the delivery often took days as no secure SatCom could be established.

The experiences of the RELEX Crisis Platform of the European Union Commission[17] can also give insights into the European capabilities. During and in the aftermath of a crisis, decision makers need satellite imagery in order to be able to assess the impact of the crisis. Impact assessment, however, can only be conducted if satellite imagery of the same spot but prior to the crisis is available. On the basis of this, change detection can be conducted and conclusions can be drawn on the impact of the crisis. Consequently, a geospatial data-base has to be established prior to the crisis. In order to do so, areas for regular monitoring by the EC's Joint Research Centre (JRC) have to be chosen. Such prioritised areas are usually areas where a crisis is expected to happen. A timeframe for monitoring has to be assigned. Crisis-prone areas are monitored in shorter intervals than other areas. In order to prioritise areas to be monitored, early warning indicators such as intelligence sources are used. For accurate damage and impact assessment, regular monitoring and the establishment of a satellite imagery database in order to guarantee the continuous availability of satellite imagery is a necessity.

The EU seems to have started to look into the provision of internal security through space applications only recently with research programmes included in FP 5 to FP 7 dealing mainly with the prevention phase and remaining at research level. ESA and EC need to ensure that projects move beyond the mere demonstration phase, covering all phases and critical mission areas equally. ESPI identified a total of 140 projects, initiatives and satellites of which 92 were European and 48 national ones.[18] The results from demonstrations and FP research should be seriously considered by ESA as building blocks when planning and deciding on new satellite missions. The EU is not following a centralised approach through a DG Internal Security. Thus, there is a fragmentation among different policies (horizontal), different bodies and actors (institutional) as well as between the EU and its member states (vertical). The Council has recently started to draft an Internal Security Strategy[19] complementing the European Security Strategy (ESS). This was one of the priorities of the Swedish EU Presidency.[20]

Very similar conclusions can be drawn when looking at the use of space applications in the fight against piracy or the broader area of maritime security. Current projects and efforts are scattered and non-transparent, leading to a risk of duplication of efforts due to the lack of overview of existing projects and actors involved. Other European attempts have a regional focus (e.g. the EPN) on European waters for European bodies. Current EU attempts are of sectoral nature and cover environmental issues separate from security-related aspects. Moreover, there is compartmentalisation and lack of interoperability of different information systems for monitoring the position of ships at sea, requiring a comprehensive approach to the sharing of maritime surveillance data.[21] This process of integrating surveillance needs to encompass all user communities at national and the Community level. The Commission's Member States Expert Group on maritime surveillance could serve as an exchange platform.[22]

The EU is in a position to create a 24/7 maritime surveillance system by combining existing surveillance measures. Recently, progress is being made in terms of combining existing maritime surveillance systems with a sectoral focus (e.g. fishery, oil spill, etc.) through the establishment of a common information sharing environment for the EU maritime domain.[23] When adopting such an Integrated Maritime Management, Europe should avoid an emphasis on ESDP-related maritime threats, which divert attention away from the general field of surveillance of the maritime area. Instead, ways should be sought to achieve mutual enhancement and cohesion between various inter-related areas of maritime surveillance. Thus, the EU seems to already have all the necessary instruments at hand but needs to put them together and develop a comprehensive maritime security policy. The Council has most recently invited "the High Representative, together with the Commission and the Member States, to undertake work with a view to preparing options for the possible elaboration of a Security Strategy for

16 Öller, Gustav. "European External Operations and Reliance on Space: A Case Study." Presentation. EC-ESA-EDA Workshop on Space for Security and Defence. Brussels, Belgium. 16 September 2009.

17 This case study is based on Cseko, Arpad. "EU Civilian Crisis Management: Today's Needs, Tomorrow's Challenges." Presentation. Presentation. EC-ESA-EDA Workshop on Space for Security and Defence. Brussels, Belgium. 16 September 2009.

18 cf. Remuss, Nina-Louisa. "Space and Internal Security – Developing a Concept for the Use of Space Assets to Assure a Secure Europe." ESPI Report 20. Vienna: ESPI, 2009.

19 Draft Internal Security Strategy for the European Union: "Towards a European Security Model" <http://register.consilium.europa.eu/pdf/en/10/st05/st05842-re02.en10.pdf>.

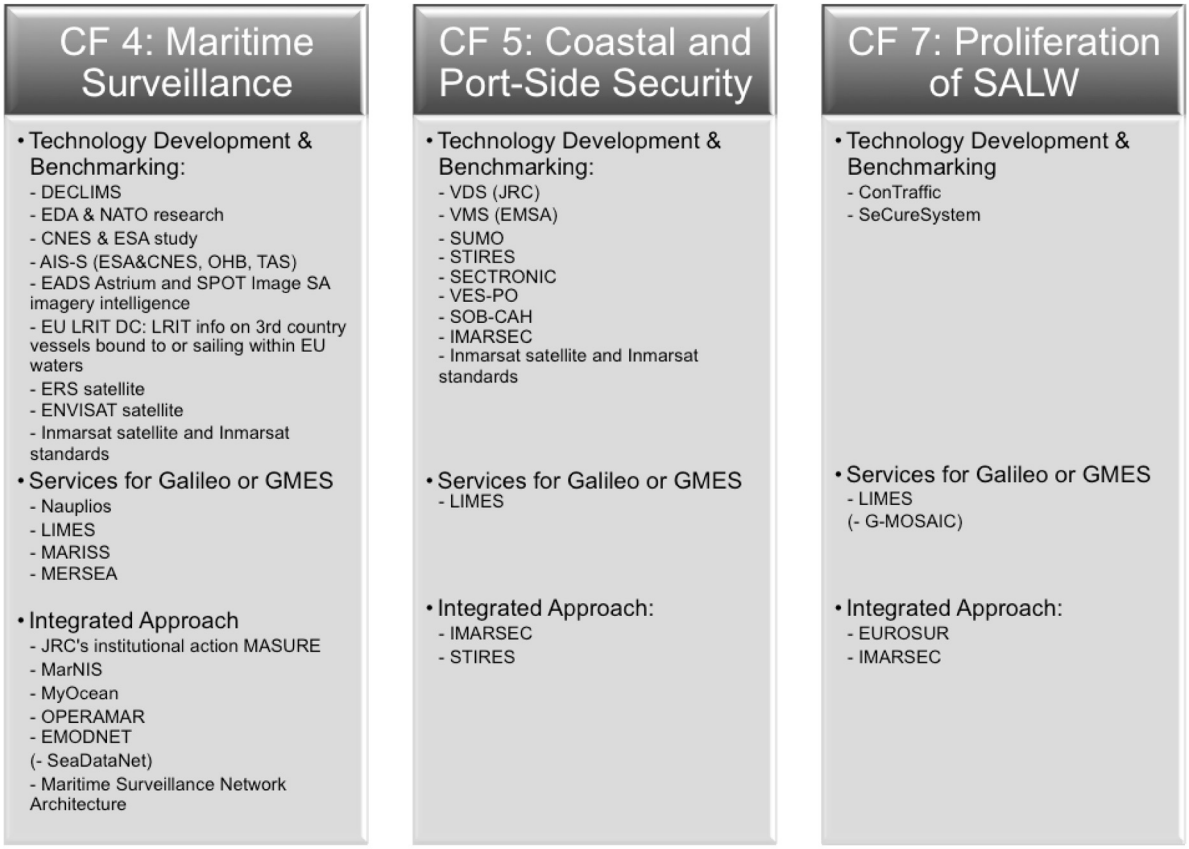
20 cf. Council of the European Union. EU Internal Security Strategy. 6870/10 (Presse 44) of 25 February 2010. Brussels: European Communities. <http://www.statewatch.org/news/2010/feb/eu-council-int-sec-prel.pdf>.

21 European Security and Defence Assembly / Assembly of Western European Union. European Maritime Surveillance. op. cit. 2.

22 Mattila, Isto. op. cit.

23 In October 2009 the Commission issued a communication entitled "Towards the integration of maritime surveillance: A common information sharing environment for the EU maritime domain" (Commission of the European Communities. COM (2009) 538 final of 15 October 2009. Brussels: European Union.), which puts forward several guiding principles for the development of a common information sharing environment for the EU maritime domain in the context of taking "steps towards a more interoperable surveillance system, bringing together existing monitoring and tracking systems used for maritime safety and security, protection of the marine environment, fisheries control, control of external borders and other law enforcement activities."

Figure 5: European initiatives tackling maritime surveillance, coastal and port-side security and proliferation of Small Arms and Light Weapons (SALW) (i.e. three factors which have been identified as causative factors for piracy)



the global maritime domain."[24] Such a European Maritime Security Strategy should not only solve the coordinative issues and data-flow challenges between existing system but should also clarify the competences of the institutions involved as well as institutionalising cooperation with other international organisations. It should stress the importance of the use of technology – in particular space applications – for the provision of maritime security.[25]

Considering the topics that are currently under discussion in the context of Europe and space policy, e.g. workshop and conference topics as well as study, article and presentation requests, the following recurring issues for Europe to solve can be identified: emerging new technology requirements; the need for operational capabilities, i.e. how to address the transition from demonstration to operation; the need to exploit synergies between military and civil applications; the need to involve users in the research and development process; issues related to data policy (standardisation and regulation, i.e. countering the EU's islands of data by establishing standardisation of data to improve data sharing, protection of sensitive data while at the same time not hindering data sharing for emergency response, for example, i.e. across borders and user communities); the need for a more integrated approach in terms of integrating European and national assets, capabilities and services, integrating SatCom, SatNav and EO, and integrating space applications with other terrestrial applications. Responsive Space (RS) is a concept that addresses all these issue-areas in a holistic manner (see: Figure 6). Its main objective is to provide more flexible and more affordable space applications to users. Responsive Space is neither a simple armament approach nor is it a futuristic technology-push model. It is a concept whose time for more detailed investigation has come and for which appropriate policy perspectives must be developed, now. Its benefits for European civilian and security related issue areas are abundant and should be given detailed and thorough consideration.[26]

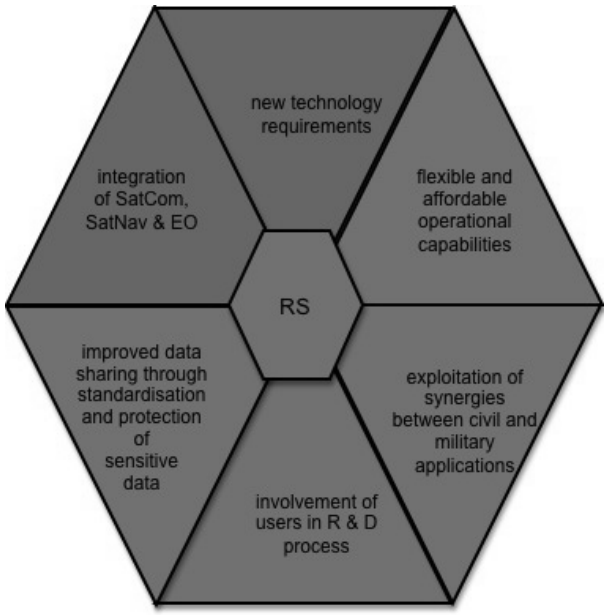
ESA is currently exploring new potential concepts in the realm of space and security consistent with its convention, the European Space Policy and the recent resolutions adopted by the Space Council and by the ESA Council at ministerial

24 Council of the European Union. Council Conclusions on Maritime Security Strategy of 26 April 2010. Luxemburg: European Communities.

25 A detailed elaboration on findings and recommendations with regard to the use of space applications in the fight against piracy can be found in Remuss, Nina-Louisa. Space Applications as a Supporting Tool Countering Piracy – Outline for a European Approach. ESPI Report 26. Vienna: ESPI, 2010 (forthcoming).

26 Details on the elements of a roadmap to develop RS in Europe can be found in Remuss, Nina-Louisa. "Responsive Space for Europe – Elements for a Roadmap for Europe based on a comparative analysis with the U.S. Operational Responsive Space Concept." ESPI Report 22. Vienna: ESPI, 2010.

Figure 6: Responsive Space – a holistic approach to the issues currently at stake



level. One of these is GIANUS (Global Integrated Architecture for iNovative Utilisation of space for Security), which aims at meeting user needs particularly with an eye to the increased dependence of the EU on space assets, the need for tools in the operational theatres and the increased opportunities arising from, in particular, the FP 7 projects. GIANUS is currently designed to contain a responsive element.

3. Europe as an International Actor

3.1 The Draft Code of Conduct for Outer Space Activities as identity-forming element

Europe is still looking for a distinct identity in space for security and its role as an international actor on the international scene. While ensuring coherence with the fundamental European values as laid down in various EU documents such as the European Security Strategy (i.e. be *principled*), Europe should exert influence by normative action instead of just handling or administrating the status quo set by others (i.e. adopt a *formative* role). A first step towards adopting, building and implementing such a *formative role* and *principled identity* has been undertaken through issuing the Draft Code of Conduct on Outer Space Activities (CoC[27]), as voluntary binding rules of the road for space and security. When discussions on the peaceful uses of outer space were deadlocked in the Geneva-based Conference on Disarmament (CD) with Russia and China favouring a treaty-based approach to the subject and the U.S. under the Bush administration not wanting to discuss the matter at all, Europe adopted the role of a mediator proposing the CoC (Code of Conduct)[28].

The Code of Conduct project is thus part of a larger EU space policy and the development of a strategic culture, i.e. the "habit of thinking along certain lines" in space security. Europe will not only defend its interests but will assert its identity.[29] Europe needs to develop a Space Security Identity, by adopting, building and implementing a *formative role* and *principled identity* in matters of space security,[30] in order to have a firm base from which to take a position when other space-related issues arise. Such issues include the set-up of a European SSA system (possibly involving transatlantic cooperation), the increased role of space assets in internal security, or a European approach to responsive space (i.e. more flexible space assets that can be developed and launched more rapidly). For all of these issues, international cooperation remains of utmost importance. Through the Draft Code of Conduct, Europe is presenting both a substantive mechanism for dealing with problems of security in space and a promising diplomatic approach to reach a broadly acceptable result.

Through adopting a formative role and principled identity promoting certain specific European values, a group feeling is established: The citizens identify themselves with the European values and with Europe, as a result support for Europe increases and finally Europe increases its coherence and becomes a stronger actor.

3.2 NATO and Transatlantic Relations

Currently, the Allied Joint Doctrine for Air and Space Operations (AJP-3.3(A)) emphasises air operations. NATO still has to formulate its own space policy. It does not have any space assets of its own. This makes the dialogue between EU and NATO ever more important to avoid duplication of efforts. Currently the division of competencies between NATO and EU in security policy in general and space in particular is unclear, calling for further clarification of the division of labour and roles between EU and NATO. This also holds for NATO's relationship with other security providing international organisations (e.g. OSCE but also related to space with regard to ESA), where NATO seems to be still looking for its "niche". This should be done as soon as possible as relevant structures are being built and this would be the right time to plan NATO in. One very detailed question to answer would be for example whether NATO should contribute to SSA and if so how this should be undertaken.

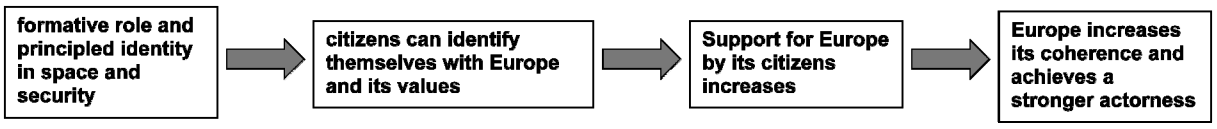
27 A code of conduct is a non-legally binding instrument, where adhering states voluntarily commit themselves to rules of the road. Similar to TCBMs, it can be seen as an ultimate goal in itself, or as a stepping stone toward a legally binding treaty.

28 The main purpose of the Code of Conduct is twofold. On the one hand, it aims to strengthen existing United Nations treaties, principles and other arrangements, as subscribing states commit to make progress toward adhering to them, implementing them and promoting their universality. On the other hand, it aims to complement the United Nations treaties, principles and other arrangements by codifying new best practices in space operations, including notification and consultation. This should strengthen confidence and transparency among space actors and contribute to developing good faith solutions that allow access to space and the carrying out of space activities for all. For the background on the discussions in the CD and the development of the CoC, consult Rathgeber, Wolfgang, and Nina-Louisa Remuss. op. cit.

29 Rynning, Sten. „Towards a Strategic Cultre fort he EU." Security Dialogue 34.4 (2003): 479-496. 482.

30 Rathgeber and Remuss, op. cit.

Figure 7: How the adoption of a formative role and principled identity contributes to Europe's actorness



While topics such as space exploration and the strategic economic importance of space are currently dominating the transatlantic debate, there is probably the greatest potential for cooperation and coordination between Europe and the U.S. in many security-related fields such as internal/homeland security, maritime security, critical infrastructure protection, responsive space and SSA. In many cases, without systematic pan European and trans-Atlantic coordination, each side of the Atlantic would be at greater risk of attack. Thus, the U.S. and Europe need to establish points of contact to ensure opinions are conveyed correctly to their counterparts. Considering the provision of internal/homeland security for example, neither the U.S. nor Europe are yet well organised enough to advance the provision of internal/homeland security. The different mechanisms set in place in Europe and the U.S. have complicated transatlantic cooperation. Scattered efforts must now be incorporated into a systematic, high-profile effort to "transform" homeland security in all of its many dimensions. While complete transatlantic agreement is utopian, but the EU and the U.S. should aim at presenting a unified message about their commitment and the fundamental values they espouse. This requires both to internally assess their core principles in this provision with the objective to draft a public declaration on fundamental principles for confronting terrorism, organised crime and illegal migration. Such a declaration should provide for a guiding strategy on cooperation, thereby underlining the principles and values both share in the fight against terrorism. Considering the issue area of Responsive Space, both agree on the importance of developing responsive space to manage new security challenges but differ in terms of the types of space assets they would like to develop. This is mainly a result of their diverging perceptions of security and threats.

However, given that responsive space is partly about the rapid exploitation of existing capabilities (cf. Tier 1 of the U.S. ORS concept), cooperation seems to be the logical consequence when aiming at increasing the range of existing capabilities. RS also includes rapid launches (cf. Tier 2 & 3 of the U.S. ORS concept). For launches to become more responsive, one needs to consider: (1) the ground infrastructure available, (2) the launch vehicles and (3) the functional design choices of the satellite. Thus, modular or standardisation of satellite designs and launchers in both Europe and the U.S. would allow for faster launches. Moreover, coordination in the technical development would allow both to gain. Coordination and Cooperation does not mean to adopt the other's approach. It is rather about rapprochement, confidence building and understanding of each other's policies, values and practical approaches. While Europe and the U.S. will each follow their own distinct approach, both need to find a common ground as to create a win-win situation for both. Both can learn from the experiences particularly in the context of legal, organisational and managerial challenges. Coordination particularly in the area of technical development should be fostered as to establish design standardisations. Workshops like the ones for cooperation in the context of SSA should be envisaged to agree right from the start on the most effective ways of cooperation.

Figure 8: Comparing the European and U.S. approach to Responsive Space

Europe	U.S.
– RS concept is based on a broad definition of security and the development of dual-use programmes and applications, i.e. space = security enabler	– RS concept is driven by U.S. strategists' concept of "battlefield awareness", i.e. space = strategic enabler
– Users are broadly defined as the security community ranging from emergency forces to the military	– User is mainly the Joint Force Commander (JFC) and user requirements are based on the "warfighter's needs"
– Just starting to consider space applications as a critical infrastructure	– ORS is part of a larger Critical Infrastructure Protection Policy
– ESA is defined as a civilian agency; funding is coming from civilian sources	– U.S. space policy funding is largely coming from military sources (DoD budget is larger than NASA's budget)

4. Further questions to solve

Having given a detailed overview of the developments in Europe in the area of space and security, and having enumerated some specific recommendations, some broader questions should not be lost track of. Those include the clarification of the governance structure for space and security and the related research, the coordination between different levels of space activities, the clarification of the ESA-EU relations in the long run (will ESA remain separate from the EU institutional structure as it is established today?) and the specification of role for ESA and EC in the various issue areas. New arising issue areas will also need to be closely followed such as how to deal with the interference of non-state actors with satellites (e.g. Space Terrorism[31]). In

31 Remuss, Nina-Louisa. "The Need to Counter Space Terrorism – A European Perspective." ESPI Perspective 17. Vienna: ESPI, 2009.

the long-run, a framework providing for strategic guidelines in the field of space and security will be needed. This could be done through the introduction of a European Space Security Strategy (E3S)[32] complementing the existing ESS.

List of Abbreviations

CoC	Code of Conduct
CD	Conference on Disarmament
E3S	European Space Security Strategy
EC	European Commission
ECAP	European Capabilities Action Plan
EDA	European Defence Agency
EPN	European Patrol Network
ESA	European Space Agency
ESP	European Space Policy
ESRAB	European Security Research Advisory Board
ESRIF	European Security Research Innovation Forum
ESS	European Security Strategy
EUISS	EU Institute for Security Studies
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EUSC	European Union Satellite Centre
FP7	Seventh Framework Programme for Research, Technological Development and Demonstration Activities
GIANUS	Global Integrated Architecture of iNnovative Utilisation of space for Security
GMES	Global Monitoring for Environment and Security
GoP	Group of Personalities
HR	High Representative
IA	Imagery Analyst
IAEA	International Atomic Energy Agency
JRC	Joint Research Centre
OHQ	Operations Headquarters
RS	Responsive Space
SEDE	Subcommittee on Security and Defence
SPASEC	Security Panel of Experts
SSA	Space Situational Awareness
UAS	Unmanned Aerial Systems

32 "In need for a European Space Security Strategy (E3S) – Joint Memorandum by IFSH and ESPI." ESPI Special. Vienna: ESPI/IFSH, 2007.