

Governance Beyond the Global: Who Controls the Extraterrestrial?

LINDY NEWLOVE-ERIKSSON* & JOHAN ERIKSSON**

*Royal Institute of Technology, Sweden

**Swedish Institute of International Affairs, Stockholm, Sweden

ABSTRACT *How is outer space governed? This article argues that private authority is gaining salience in space politics, even with respect to the traditionally state-centric security and military aspects of space. Further, while commercial actors have always played a role in space programs, three significant changes can be detected: transnational conglomerates and consortia as opposed to individual corporations are emerging as key partners in space politics; private partners are gaining stronger and wider responsibilities for the development and management of space programs (including manned spaceflights); and public accountability is increasingly at stake due to a widening of security in space policy. The latter development includes a blurring of key distinctions between military and civilian usage (also referred to as dual-use or dual-role application), as well as between the public and private realms.*

Keywords: critical infrastructure, dual-use technologies, private authority, public–private partnership, space, security

Introduction

The rise of private authority¹ and transnational networks are examples of features analyzed in the burgeoning literature on globalization. Recent contributions emphasize complexity and variety, and highlight that globalization is not a uniform process. Contemporary analyses commonly stress the involvement of both governmental and nongovernmental actors, including cabinets, ministries, agencies, corporations, political parties, pressure groups, etc.—actors that are often internally fragmented, and typically operate in complex transnational networks.

Correspondence Address: Lindy Newlove-Eriksson, Royal Institute of Technology, Dept. of Industrial Economics and Management, Stockholm, Sweden. Email: lindy.newlove-eriksson@fhs.se or lindy.newlove-eriksson@indek.kth.se; Johan Eriksson, Swedish Institute of International Affairs, Box 27035, SE 102 51 Stockholm, Sweden. Email: johan.eriksson@sh.se or johan.eriksson@ui.se

While states are generally considered to be crucial and often the most powerful players, it is also emphasized that states have lost absolute power—if they ever had it—and are currently being compelled to change and adapt to a more interdependent world (Barnett and Duvall, 2005; Scholte, 2005).

Our contention is that the politics of outer space, which is the empirical subject of this article, is characterized by strong indicators of globalization such as the spread of and reliance on multinational satellite systems, and thus by definition goes beyond the terrestrial or typically ‘sovereign’ domain (Bormann and Sheehan, 2012; Hertzfeld, 2007). If there is a realm lacking definition under territorially organized jurisdictions, that realm is space. Surprisingly, however, key features of globalization, such as deterritorialization and the emergence of corporate transnational power, are barely mentioned in the literature on space politics.² The space politics literature has remained strongly state-centric. The main structural change observed in this area concerns the increase in the number of states and intergovernmental organizations involved in this policy area, which was originally the exclusive playing field of the two superpowers of the Cold War (Bormann and Sheehan, 2012; Harvey et al., 2010; Sadeh, 2011; Sheehan, 2007). Correspondingly, the literature on globalization has largely ignored space politics.

We argue that private authority is gaining salience in space politics, even with respect to the traditionally state-centric security and military aspects of space. We also hold that the globalization and global governance literature is applicable to contemporary space politics, particularly theories and concepts on the development of private authority and transnational Public–Private Partnerships (PPPs).³ We further contend that whereas commercial actors have always played a role in space programs, three significant changes can be detected: transnational consortia as opposed to individual corporations are emerging as key partners in space politics; private partners are gaining greater responsibilities for the development and management of space programs (including manned spaceflights); and public accountability is increasingly at stake due to a widening of security in space policy.⁴ The latter development includes a blurring of key distinctions between both military and civilian usage (also referred to as dual-use or dual-role application),⁵ as well as between the public and private realms.

This paper has a four-part structure. First, we discuss the traditional state-centric perspective on space politics, which contains competing optimistic and pessimistic views. Subsequently, we address the literature on the growth of private authority in world politics, contesting the state-centric perspective on space politics. The ensuing empirical section approaches contemporary space politics with a focus on North America and Europe, particularly with respect to how and with what consequences private authority and transnational PPPs have risen in significance. In the conclusion, we offer reflections regarding security issues and their broadening and conflation with civilian issues, the manner in which private authority has taken on new leadership in space politics, and how these developments entail presently unresolved problems of accountability. Specifically, we argue that combined demands for protection of business and military secrecy risk putting public scrutiny at stake.

The Traditional View: Space as State-Centric

The politics of space can be described as two contending stories, one optimistic and the other essentially pessimistic, basically corresponding to the liberal and realist paradigms of International Relations (IR).

The Light Side

Since time immemorial, space has been envisioned as ‘the Heavens’, as the home of God(s). Space continues to be regarded by many as a sacred realm, a sanctuary which is—or ought to be—exempt from the trials of terrestrial tyranny, power politics, and violent conflict (Tranchetti, 2011). In 1952 the International Congress on Astronautics officially condemned astronautic research for military purposes (Manno, 1984, p. 23; Moltz, 2008; Sheehan, 2007, p. 6). Cementing this liberal notion of space as a demilitarized sanctuary, the 1967 Outer Space Treaty conveyed the same normative convictions lying behind demilitarization of the Antarctic and the idea of keeping the Nordic countries as a non-nuclear zone.

A positive image from this story is that of astronauts and cosmonauts greeting one another after having successfully docked their space vessels in the 1975 Apollo–Soyuz mission which symbolized peace, friendship, and collaboration, rather than hostility and Cold War. The idea of a ‘hand-shake in space’, which was suggested by Henry Kissinger, was to symbolize the new *détente* (Sheehan, 2007, p. 65). With a similar symbolic purpose, a joint American–Russian crew was sent to the MIR⁶ space station in 1994 and to the International Space Station (ISS) in 2000.

The liberal narrative of space is also about modernity, of how rationality and science continually advance technology, not only yielding knowledge regarding what lies beyond our own planet but also, through the exploration of space, helping us improve life on Earth. Space is the ‘new frontier’, as President Kennedy repeatedly phrased it, inspiring hope for a better future not only for a particular nation, but for humanity. Akin to this are the legendary words of Neil Armstrong, observing that his first steps on the moon on 21 July 1969 were ‘one giant leap for mankind’.

A Story of Greater Gravity

The contending realist narrative is more pessimistic—cynical, even. When the USSR launched Sputnik I in 1957, this symbolized not only the beginning of the ‘space age’, but also that of the ‘space race’. The Cold War which had broken out between the two superpowers also moved immediately into space. In the words of Sheehan (2007, p. 8):

The motivating driver of both [the American and Soviet space] programmes was the acquisition of military capability, both in terms of missiles able to deliver nuclear weapons, and satellites capable of securely performing reconnaissance missions over adversaries’ territory. [...] The civilian and military programmes were linked to the extent that the former diverted attention from the latter, and in some cases, such as the US Explorer/Corona satellite, was used as a deliberate cover for military activities.

The military use of space had been seen as essential since exploration began—it was the ‘new high ground’ (Sheehan, 2007, p. 3). It was also, from the very outset, both a techno-strategic and a techno-symbolic goal to develop intelligence and weapons systems with a global reach. Thus, achieving symbolic leadership by being ‘first’ and reaching ‘farthest’ was an important prong in the overall security strategy. Not surprisingly, US–USSR space collaboration deepened during the *détente* of the 1970s, while there was a setback during the new Cold War of the 1980s, the ‘Star Wars’ decade (Moltz, 2008).⁷

Since the 1950s, conflict and cooperation, as well as military and civilian objectives, have characterized space politics. The predominant logic, however, has been one of militarization, the arms race, and power struggles (Logsdon and Schaffer, 2005; Manno, 1984; McDougall, 1985; Moltz, 2008; Sheehan, 2007). Further, newer space powers, particularly in Europe and

Japan, have added explicitly military and security-oriented dimensions to their space programs, which were originally geared to civilian purposes (Berner, 2005; Harvey et al., 2010; Moltz, 2008; Pekkanen and Kallender-Umezu, 2010; Sheehan, 2007). Moreover, some newcomers, particularly states in the Middle East, from the outset went into space specifically for military and security purposes rather than for commercial ends (Burzykowska, 2009, p. 188; Harvey et al., 2010, p. 387).

An Alternative View: Private Authority and Public–Private Partnership

Recent studies have observed the growing number of states and intergovernmental actors involved in space politics, which is no longer the sole domain of a few superpowers. Today, it is not only European countries, China, and India (Sadeh, 2011; Sheehan, 2007) that are regarded as space powers, but also states in the Middle East and South America (Burzykowska, 2009, p. 188; Harvey et al., 2010; UNESCO, 2010, pp. 94–95). This observation strengthens rather than challenges a state-centric view of space politics, however. The majority of space policy literature remains generally focused on states (and intergovernmental organizations) rather than on more complex commercial or quasi-commercial constellations, particularly with respect to military and security issues.

A range of liberal and critical perspectives have challenged traditional state-centric perspectives on world politics. Many of these alternative perspectives can be loosely grouped under the label of ‘global governance’, emphasizing how world politics is shaped through complex networks of public and private actors, cutting across the domestic–international divide (Barnett and Duvall, 2005; Bexell et al., 2010; Bexell and Mörth, 2010; Scholte, 2005).

One theme that stands out among approaches to global governance is the rise of private authority (Cutler et al., 1999). Within this theme it is argued that private actors are increasingly becoming ‘authors’ of policies, practices, rules, and norms; they engage in setting agendas, guaranteeing contracts, and even providing order and security (Bexell and Mörth, 2010; Hall and Biersteker, 2003, pp. 4–5). A number of major corporations today—Royal Dutch Shell and Walmart, to name but two examples—are far richer than many countries (Laudal, 2011). The rise of private authority goes beyond corporations and NGOs, including grassroots movements, criminal and terrorist organizations, and more loosely organized social movements. Of particular interest is how private authority tends to be disconnected from public accountability and responsibility—what Rosenau (1990) calls the power of the ‘sovereignty-free’. Indeed, ‘limited liability’ is a cornerstone of company formation, identity, and financial security.

Given the rise of private authority and the tenacity and adaptability of governmental systems in a globally interconnected world, the realm of PPP is particularly interesting. Importantly, ‘partnerships on public policy matters are cooperative initiatives that expand the political authority of nonstate actors, whether profit-oriented businesses or nonprofit foundations and civil society organizations’ (Bexell and Mörth, 2010, p. 6). Analyses of partnerships typically focus on questions of participation, goals, and how risks and responsibilities are shared (Bexell and Mörth, 2010, p. 6; Hayllar et al., 2010; Schäferhoff et al., 2009, p. 453). PPPs can be more or less formalized, with variable focus on economy and cost-sharing. Further, they may be focused on a single policy domain or cut across a wide range of issues. Transnational PPP seems to be a relatively recent and growing phenomenon (Bexell and Mörth, 2010; Mörth, 2008; Schäferhoff et al., 2009).

The EU is a noteworthy initiator of and arena for transnational PPP, the most significant example in this context being the Global Navigation Satellite System (GNSS), Galileo.

Galileo was the ‘first major space programme to be financed through a public–private partnership’ (Bildt and Dillon, 2004, p. 10), but this PPP failed in 2007 in its original form due to governance, budget, and Research and Development (R&D) issues, combined with other organizational problems (European Court of Auditors, 2009; Mörth, 2007). Notwithstanding these difficulties, Galileo, including the European Geostationary Navigation Overlay System (EGNOS) and the Global Monitoring for Environment and Security (GMES) programs were reaffirmed in the 2010 Space Council Resolution and by the European Council the following year as the ‘flagship’ programs of the EU (European Council, 2011; Space Council, 2010). Contracts amounting to over 1.5 billion euros for everything from procurement to maintenance have recently been awarded to aerospace multinationals (European Commission, 2010a, 2010b, 2011b).

The rise of private authority in general and the expansion of transnational PPP in particular imply that policies are shaped through overlapping and often rather loosely defined governance systems (Bexell and Mörth, 2010; Schäferhoff et al., 2009). PPP has been marketed as a method for overcoming both ‘government failures’ (low efficiency, high costs) and ‘market failures’ (unequal distribution of infrastructure; Hoon Kwak et al., 2009, p. 52; Walsh, 1995). Many PPPs have, however, been terminated due to the following problems: gaps between public and private sector expectations; unclear objectives, policies, and decision-making procedures; poor risk management; lack of funding; poor transparency; and lack of competition (Hoon Kwak et al., 2009, p. 51; cf. Hayllard et al., 2010; Wettenhall, 2003). Such concerns are also detailed in the literature on Corporate Social Responsibility (CSR) (Lindgreen and Swaen, 2010).

It can be argued that as PPP by definition involves both public and private actors, definition of roles and areas of responsibility are not self-evident, which *ceteris paribus* more readily leads to accountability problems than is the case in purely public or solely private arrangements. In a PPP, there are pre-defined internal ‘others’—the public vis-à-vis the private partners—that without concretely designated responsibilities can easily succumb to mutual blame allocation when things go awry. The simultaneous widening of security and growth of PPP—particularly in security-related policy domains—suggests that such accountability issues are becoming increasingly significant (Svedberg Helgesson and Mörth, 2012).

Despite accountability problems, the notion of PPP has maintained its political popularity in liberal democracies (Hayllard et al., 2010; Hoon Kwak, 2009, p. 51). PPP is indeed presently experiencing a resurgence in the UK, in the space and other sectors, sometimes going under the rubric of Private Finance Initiative (PFI) (UK Government, BIS, 2010: 14; UK Government, DHSSP, 2011). Our primary focus herein concerns how, under what conditions, and with what consequences transnational private authority is growing in space politics. We address the preceding through scrutiny of policy developments and initiatives in contemporary North American and European space policy.

The Rise of Private Authority in Space Governance

Governmental actors play an essential and often dominant role in space politics (Handberg, 1995; Moltz, 2008; Sadeh, 2011). Nevertheless, conceiving of states as *unitary* and *solitary* actors in space politics is misleading. The bureaucratic politics of, for example, the American National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) makes it clear that the assumption of ‘states-as-unitary actors’ in space politics must be relaxed. Moreover, commercial parties and PPPs in space governance have increased in number, and arguably also in significance, over the past decade (Howard, 2008, pp. 729–730; Sadeh, 2005).

Beyond Space Tourism: Public–Private Partnerships in Space Governance

Business interests in space go far beyond the ‘space tourism’ of Sir Richard Branson’s Virgin Galactic and other like-minded ventures. Private enterprise is heavily involved in the military and more broadly security-oriented dimensions of space politics (Marchetti and Biancalana, 2008; UK Government, BIS, 2010). Commercial investment in military and security-oriented space technology has not received the same level of media attention as space tourism, and is under-researched in academia as well (for some exceptions, see Goh, 2007; Howard, 2008, 2009; Smith and Baumann, 2011; von der Dunk, 2010). There is thus ample room and reason to scrutinize the shape and significance of business power in the space security sector. In the words of Handberg (1995, p. 1):

Commercial space is no longer merely the dream of visionaries or the province and playground for earthbound government bureaucrats. As the pieces of the tragic Space Shuttle Challenger rained down on the Florida coast in January 1986, private space enterprise rose phoenix-like from the wreckage.

Handberg’s 1995 observation of growing private authority in space governance has been corroborated over time. Importantly, whereas the early space industry was contracted by governments to provide equipment, it has taken on a larger role as an independent system provider since the 1980s. This has been the result of several converging developments: political demands for cost reductions and efficiency, particularly following NASA disasters; the neoliberal trend of deregulation during the 1980s; and the internal ‘maturation’ of the space industry (Hertzfeld, 2007, p. 215).

The Reagan administration of the early 1980s emphasized that one of the basic goals of American space policy was to ‘expand United States private-sector investment and involvement in civil space and space related activities’ (White House, 1982, p. 1). In 2010, President Obama stressed that as a result of the global financial crisis, ‘the US would need more partnerships, with other countries and with the private sector’ (Smith, 2010, p. 20; cf. Chen and Macauley, 2011; Space Security Organization, 2011, p. 16). The US has clearly downplayed its ambitions for superpower ‘leadership’ in space politics (Logsdon, 1992). Importantly, the Obama administration has made clear that future manned spaceflights—perhaps the most controversial issue in contemporary space policy—should be based on *partnership* between NASA and the private sector (Smith, 2010, p. 22). The NASA space shuttle program came to an end on 21 July 2011, after a final mission to the ISS.

The emphasis on private-sector involvement in the space sector in the 1980s was consistent with influential neoliberal ideas of that decade. The notion of ‘new public management’ that was particularly popular at that time claimed, for example, that government functions and societal programs would be less costly and more effective if run according to ‘market principles’, characterized by competition of service providers, PPP, and privatization of publicly owned and administered utilities (Boston et al., 1996; Dunleavy et al., 2006). Continued emphasis on the importance of the private sector in space governance appears, however, to have less to do with ideology than with financial problems and heavily criticized outcomes of government-run space programs (Hertzfeld, 2007), epitomized in reactions to the Space Shuttle Columbia disaster in 2003.

The growing presence of the private sector in European space governance is similar to the American situation on both the national and international levels. The UK government, for example, launched a PPP policy in 2000 for the defense and security industry, and dual-use PPP was promoted in the recent UK Space Innovation and Growth Strategy (UK Government,

BIS, 2010). Transnational PPPs for European space policy have also been advocated (Mörth, 2007; Sadeh et al., 2005). Such tendencies not only imply greater reliance on private actors in the space sector (such as transnational giants Boeing, BAE Systems, EADS/Astrium, Finmeccanica, Raytheon, and Thales); they also explicitly open opportunities for private enterprise to take on *responsibility* for providing public services, including satellite systems and other space ‘infrastructures’ (EMCC, 2011). In 1995, Handberg wrote that the role of private enterprise in military space activity ‘remains that of vendor and contractor’ (Handberg, 1995, p. 8). This is no longer an accurate description. The trend of endowing private enterprise with public responsibilities not only strengthens private authority, but also blurs the distinction between ‘public’ and ‘private’ at large, in effect putting accountability at stake (cf. Bexell and Mörth, 2010; Hayllar et al., 2010; Svedberg Helgesson and Mörth, 2012).

Industrial involvement in European space policy is not merely discussed in terms of cost-effectiveness, but is also framed in terms of the space industry being one of the key industries for securing future economic development. The creation of the ESA in 1975, which replaced earlier coordinating organizations, was apparently intended to generate a more ‘bottom-up’ approach, initiated and strongly influenced by scientists and industrial lobbies rather than political leadership (Sheehan, 2007, p. 85). The ESA also gave contracts to transnational consortia rather than to individual firms, something which spurred not only the tendency towards industrial cross-boundary mergers, but also the development of broader transnational networks involving national space agencies, the ESA, the EU, Euratom, NATO, and the multinational space industry (Sheehan, 2007, p. 85).

While initially quite passive, the EU has over time carved out an increasingly salient position in European space policy, particularly with the Lisbon Treaty, which entered into force on 1 December 2009. EU space policy has been developed partly in cooperation with the ESA and other agencies and consortia, and partly in an ‘independent’ European fashion, embodied in the ‘flagship’ of EU space policy, Galileo (European Council, 2008). Since 2007 Galileo has been subsidized through joint public funding by the Commission and the European Space Agency (ESA); current plans entail EU-led contractually based partnering with European as well as international commercial actors (European Commission, 2011a, pp. 10–12).⁸ Much like the ESA in the 1970s, the EU has emphasized the significance of private enterprise in space and the significance of space programs for aiding general economic development in the EU (European Commission, DG Enterprise and Industry, 2010).

The rise of private enterprise in space is often referred to as the ‘commercialization’ of space (Chen and Macauley, 2011; Howard, 2008, 2009; Kosmo, 1988; Peeters, 2003). For two reasons, however, we argue that the notion of ‘commercialization’ of space is misleading. First, it gives the impression of purely private activities, whereas a large number of space programs are in fact PPPs (Howard, 2008, 2009). Private authority in space policy perforates not only the public–private divide, but also the domestic–international distinction. Space policy—like other global issue areas—is increasingly developed through global governance structures. National governments and agencies involved in multilevel and multinational space initiatives, intergovernmental and supranational bodies, industrial consortia, individual corporations, and the science community are all active in space policy.

A second reason why the term ‘commercialization’ is misleading is that it can give the impression that space programs concern purely civilian applications and activities. This obscures the increasingly blurred distinction between civilian and military applications through the promotion and use of dual-use technologies such as Global Positioning Systems (GPS) and other GNSS networks (Larsen, 2001; Seebode Waldrop, 2003). Indeed, there is now broad recognition

of the ‘inherent dual-use of most space activities, hardware and technology’ (von der Dunk, 2010, p. 89) and the fact that ‘military operations are inextricably linked to commercial space assets’; in the American context, the majority of space manufacturing is geared at the ‘national security community’ (Ben Ari et al., 2010, pp. 7, 27; cf. Fergusson and James, 2007, p. 14; Smith and Baumann, 2011, p. 418). A wide array of applications and dual uses are explicitly advocated in EU space policy (European Council, 2008, pp. 13–14), by the EC’s panel of experts (European Commission, 2005, p. 41), and by industrial lobby groups (EOS, 2009, p. 4; cf. ESDA, 2010). A report initiated by the European Commission goes even further and explicitly advocates a blurring of the divide between military and civilian uses (European Communities, 2010; cf. ESDA, 2010, p. 10).

This blurring also conceals the perhaps less well-known expansion of private enterprise in military and security-oriented activities within the space policy domain. A 2005 expert panel report ‘strongly recommends that the security applications of space should be given a high relevance in the forthcoming European Space Program’ and that ‘this programme should be fully harmonised with other national and commercial programmes so as to obtain maximum synergy and affordability offering an enhanced capability for all aspects of security’ (European Commission, 2005, p. 39). Similarly, a recent EU Parliament Report urged, among other things, dual-use applications. This motion included a critical minority opinion with 11 votes opposing dual-use, but was passed with 57 in favor (European Parliament, 2008, p. 12). The critical parliamentarians ‘condemn[ed]’ the militarization of the EU in general and of space in particular, including the blurring of the civilian–military distinction and the use of Galileo and GMES for security and defense purposes (European Parliament, 2008, p. 12). Dissenting voices have to date not managed to thwart the pursuit of dual-use technologies in EU security policy, including space security policy. Several leading European agencies—most importantly the Commission—as well as security industrial lobbies are at present successfully advocating dual-use applications (e.g. Zandee, 2008, p. 2).

While some observers in the 1990s argued that the distinction between military and civilian space policy had grown (Handberg, 1995), current developments point clearly in the opposite direction. Military and civilian dimensions of space policy are increasingly interconnected and the distinction between them increasingly blurred. The space policy literature typically relates this development to the rise of dual-use technologies, particularly satellite surveillance technologies, whereby private enterprise is actively engaged in public policy programs (Larsen, 2001; Sadeh, 2011). It is noteworthy that both the ESA and the European Security and Defence Assembly (ESDA) have emphasized that Europe—and the EU in particular—needs to develop ‘early warning’ satellite systems and intensify European collaboration on space and security (ESDA, 2010; cf. European Commission, 2005; Pasco, 2006).

Private Authority, Security, and Space Systems as ‘Critical Infrastructure’

An additional explanation for the growth of private authority in space governance is the impact on space policy of the tremendous growth and broadening of the ‘security’ industry. Industrial intelligence, environmental monitoring, counter-insurgency, crime-fighting, crisis management, and above all counterterrorism are booming new markets, particularly following the events of 11 September 2001. EU research funding is also increasingly geared towards security and heavily funded Framework Programme (FP) projects are typically dominated by corporate actors such as Thales, Siemens, EADS, Ericsson, Saab, and BAE Systems, or by large defense Research and Technology (R&T) organizations, such as the Dutch-based TNO, Swedish FOI and VTT in Finland.

The engorged security market has attracted the defense industry, actors established in their respective fields of, for example, ICT, aerospace, computer science, and nanotechnology, and

smaller entrepreneurs observant of break-through opportunities. Illustrative of this development is the European Organisation for Security (EOS), arguably the most influential defense and security lobby within Europe, which forwards clear objectives for broadening the traditional defense industry concept into a security defense concept with an articulated industrial policy. According to the EOS, the ‘security industrial policy’ needs to differ from a ‘defence industrial policy’ in that the market for dual-use technologies, as well as for products and services which do not have distinct military applicability yet security application potential needs to be expanded (EOS, 2009: 4; cf. ESDA, 2010).

A striking example of how contemporary space policy is simultaneously blurring the military-civilian distinction and increasingly incorporating private enterprise is found in the EU’s recent framing of space systems as ‘critical infrastructure’. According to the Commission, ‘[s]pace infrastructures are critical infrastructures which contribute to citizens’ well being and security and they need to be protected’ (European Commission, DG Enterprise and Industry, 2010, p. 1). The notion of Critical Infrastructure Protection (CIP) works as a rhetorical device which prioritizes certain infrastructures—for example, financial systems, energy, transport, and ICTs—as being of particular value to national and international security (Dunn, 2005; Moteff et al., 2003). The concept of CIP originated in the American context, gaining salience with Clinton’s 1996 Commission on CI, recommending a national strategy for protecting and assuring critical infrastructures from physical and cyber threats (PCCIP, 1997). The notion has since been picked up in policy circles around the world.

CIP and counter-terrorist initiatives are big business and the global security market has been burgeoned enormously by ‘securitization’ of services and infrastructures.⁹ It is significant and generally observed that most infrastructures deemed ‘critical’ in North America and Europe are largely owned and operated by private actors (Dunn, 2005). With the majority of infrastructures in private or combined public–private hands, PPPs abound in the CI sector. The EP3R—the European Public–Private Partnership for Resilience—is the overarching PPP hallmarking the EU’s initiative towards a new governance framework for security, safety, and critical infrastructure. Satellite systems are explicitly mentioned as a key element of this emerging partnership, and the EP3R is heavily geared at space-enabled electronic communications (European Commission, 2010c, p. 7; ENISA, 2011). One could say that the ‘military industrial complex’ Eisenhower observed in the Cold War has had new life breathed into it with the contemporary threat paradigm of terrorism and corresponding necessary protection of ‘critical infrastructures’.

In a 2008 European Council Resolution, space was added to the list of ‘critical infrastructures’. The significance of private enterprise for space policy in general, and for space *security* policy in particular, is also highlighted (cf. European Commission, 2005). The Resolution has the stated aim of ‘achieving a substantial increase in the coordination of space, security and defence-related activities’ (European Council, 2008). The Resolution explicitly acknowledges military usage of Galileo and GMES, while pointing out in a rather contradictory fashion that these are ‘civilian systems under civil control’. If, however, ‘civilian systems’ are used for explicitly military purposes, this will certainly imply a blurring of the line between military and civilian applications (cf. European Communities, 2010; Seebode Waldrop, 2003).

It is noteworthy that GMES was originally entitled ‘Global Monitoring for Environmental Security’ and intended for the purposes of charting, for example, sea-level rise and other potentially catastrophic environmental situations (cf. Moltz, 2008, chapter 2). Shortly thereafter, however, this was changed to ‘Global Monitoring for Environment *and* Security’, thus subtly broadening the scope far beyond environmental issues to include counterterrorism and other ‘non-traditional’ security issues such as human surveillance and crowd control (Pasco, 2006, p. 16). This reframing and corresponding profile implies a window of opportunity for

agenda-shaping and facilitation of the promotion of dual-use technologies. Using space surveillance systems such as GMES for monitoring environmental activity and providing early warnings of natural catastrophes as well as for gathering intelligence about terrorist activities and other antagonistic threats not only expands the space systems market, but also challenges the distinction between military and civilian domains and between public and private authority.

The present situation is clear—private authority is gaining ground in space governance in general and in space security and surveillance in particular. Parallel to this, politically and industrially motivated legislation limiting public scrutiny in the EU entrenches the status quo, drastically reducing the potential for alternative perspectives and public and political debate.

Implications for Accountability

The growing involvement of private business in space programs implies a demand for protection of business interests. Simultaneously, if the notion of space security is widened and the boundary between civil and military use is blurred, the secrecy of military missions will likely affect space programs at large. Thus, we argue that combined demands for protection of business and military secrecy risk putting public scrutiny at stake. Furthermore, the Space Security Organization—a group of North American space experts—points out that the development of PPPs and the blurring of the civilian-military divide in space are ‘creating interdependence and mutual vulnerabilities’ (Space Security Organization, 2011, p. 2). For example, with space becoming increasingly congested with satellites and orbital debris (also referred to as ‘space junk’), the ‘risk of accidental interference with space assets goes up. Even though the development of civilian space applications is driven mostly by economic aspirations and public safety considerations, the spread of launch capabilities could exacerbate regional tensions’ (Space Security Organization, 2011, p. 15).

Moreover, satellite systems are highly complex and risky socio-technical systems with diverse civil, military, and commercial functions; they are constructed, installed, and overseen by a select community of experts. They are subsequently physically distanced through ejection of the hardware—i.e. the satellites and their various, often dual-use ‘payloads’—beyond the direct control of even their developers, into orbit. There is a chain of epistemic distance, followed by physical distance, and the subsequent connection of the remote technology to a myriad of space-based services which the aligned satellites provide on Earth. The complexity and potential for both accidental and intentional multiple and cascading failures is arguably unparalleled in the space context (cf. Perrow, 1984).

The transnationalization of space governance implies further difficulties in exercising democratic control. The literature on transnational governance shows that, while not impossible, democratic governance—and particularly control by national parliaments—is more difficult to achieve in transnational as opposed to national contexts (Bexell et al., 2010; Held and Koenig-Archibugi, 2005). Moreover, the development of transnational public–private space launches implies jurisdictional problems, as it is not always clear which actors are responsible nor which jurisdictions are applicable, particularly should shuttles or satellites crash in space or on Earth. Indeed, one of the reasons why the initial Galileo PPP failed pertains to the issue of allocation of responsibility for risks (Giemulla and Heinrich, 2008, p. 39; Howard, 2009, p. 53), an issue that remains problematic. Whereas Howard (2008, p. 757; 2009, p. 97) suggests many of these problems can be solved by clarifying responsibilities contractually, we argue that contracts provide no antidote to conflicts and accountability problems. The literature on public crisis management convincingly demonstrates that ‘blame games’, where actors seek to avoid political and/or financial repercussions, are an almost unavoidable feature of crises (Boin et al., 2005; Bovens, 2007).

Conclusion

Whereas the rise of private authority and complex multilevel governance has been observed in many policy domains, particularly the environment, human rights, development, and political economy, space has traditionally been viewed as a domain of states, whether characterized by power politics or peaceful cooperation and interdependence. Space, however, is not immune to the emergence of features of globalization and global governance, particularly the rise of private authority. Importantly, this paper demonstrates that while military and security issues are as significant as ever in space politics, private authority is also gaining salience in this domain. There are three particularly noteworthy aspects of the growth of private authority in space programs. First, industry is strongly encouraged—by governments as well as significant expert and industrial lobby groups—to take on *new responsibilities*, including management, technological development, and (manned) space flights. Second, *transnational conglomerates*, as opposed to individual corporations, are emerging as key partners in space programs. Third, a *blurring of the military-civilian distinction* can be observed, bolstered by governments, experts, and the space industry.

Several parallel developments have contributed to the rise of private authority in space, including: increasing costs of space exploration; a series of failed and in some cases disastrous governmental space programs; tightened agency budgets; shifts in political ideology favoring private management models and initiatives for public purposes; and advancements in dual-use technology. The recent global financial crisis seems to have strengthened the push towards private authority and PPP.

What then are the implications of emerging private authority in space politics? Past theory and research on PPP has revealed a number of problems of relevance here, such as: gaps between public and private-sector expectations; unclear objectives, policies and decision-making procedures; poor risk management; lack of funding; poor transparency; and lack of competition. In addition, our analysis suggests that within the domain of space policy, the parallel trends of transnationalization of governance, a widened framing of space in security terms, the blurring of the civil-military boundary, and demands to protect business interests in PPPs contribute to jeopardizing public scrutiny and accountability. Against this background, we suggest a number of questions for further research.

Does the current ‘securitization’ and increase of private authority in space policy allow us to predict that the utilization of space will continue even in difficult budgetary times? What are the implications for accountability should things go awry—if, for example, accidents occur or space programs run dry? What conditions are amenable to transnational space partnerships becoming at one extreme a novel form of military–industrial–bureaucratic complex escaping public scrutiny and bottoming out public purses or, at the other end of the spectrum, becoming transparent, reliable, and well-managed organizations that are reliable and accountable when things go wrong? Further research is needed. Perhaps the ‘truth is out there’ (Lowry et al., 1995).

Notes

- 1 An increase in private authority is documented, with a rise in both the number and significance of private (non-state) actors in International Relations (IR); a growing body of literature examines the impact this may have on sovereignty, democratic accountability, and on the effectiveness and organization of policy networks (Bexell and Mörth, 2010; Cutler et al., 1999; Hall and Biersteker, 2003).
- 2 An exception is the 2009 volume *Securing Outer Space*, edited by Natalie Bormann and Michael Sheehan.

- 3 This paper employs a broad definition of PPP/P3, along the lines of Bovaird (2004, p. 200): PPP entails ‘working arrangements based on mutual commitment (over and above that implied in any contract) between a public sector organization with any organization outside of the public sector’. As Hayllar and Wettenhall (2010) point out, most PPPs are grounded in contractual economic agreements, but this is not always the case. They can also be more loosely organized as ‘networks’ or ‘strategic alliances’ and involve corporations as well as non-profit organizations.
- 4 Accountability concerns which persons or parties are responsible, particularly when things go amiss. By way of brief illustration, accountability exists when actor(s) are perceived to have an obligation to explain and justify their conduct and they face consequences depending on how their actions are judged (cf. Bovens, 2007; Svedberg et al., 2012).
- 5 Consistent with the literature, dual-use can generally be taken to include ‘high technology intended for civilian applications, but that is currently or potentially also used for military purposes (*spin on*) or vice versa (*spin off*)’ (Stumbaum, 2009, p. 12, see also von der Dunk, 2010).
- 6 ‘Mir’ is a Russian word often translated into English as ‘world’, ‘peace’, or ‘village’; see Culbertson (1996), who suggests ‘community’ is a better translation.
- 7 Reagan’s ‘Star Wars’ defense initiative was provocative to others as well, providing the impetus for France to establish EUREKA—a European-wide network for research and technological development—in 1985 (UNESCO, 2010, p. 159). EUREKA and its numerous programs, hugely funded by market-driven PPP, have since expanded greatly in terms of global membership and sectors sponsored; space and defence and the ‘synergies’ of dual-use applications are predominant themes (UNESCO, 2010; Aeneas and CATRENE, 2011, pp. 26, 115).
- 8 Another EU-driven ICT-focused PPP relevant in this context is the *Future Internet* PPP (FI PPP) which, among other things, is researching applications of satellite-based and internet-connected ‘sensor networks, radio frequency tags [Radio Frequency Identification - RFID] and positioning systems’ (European Commission, 2009, p. 6).
- 9 For example, EU business opportunities in security, including CIP, where tenders have now been opened up to international contenders, are routinely charted and promoted by the US Commercial Service (2008); the European Program for Critical Infrastructure Protection (EPCIP) has been targeted as one such area.

References

- Aeneas and CATRENE (2011) Vision, mission and strategy: R & D in European micro- and nanoelectronics, http://www.aeneas-office.eu/web/downloads/aeneas/vms_final_feb2011_1.pdf.
- Barnett, M. & Duvall, R. (2005) *Power in Global Governance* (Cambridge: Cambridge University Press).
- Ben Ari, G., Green, B., Hartman, J., Powell, G. & Sanok, S. (2010) *National Security and the Commercial Space Sector: An Analysis and Evaluation of Options for Improving Commercial Access to Space* (Washington, DC: Center for Strategic and International Studies, CSIS).
- Berner, S. (2005) *Japan’s Space Program: A Fork in the Road?* (Santa Monica: Rand Corporation).
- Bexell, M. & Mörth, U. (eds) (2010) *Democracy and Public–Private Partnerships in Global Governance* (London: Palgrave Macmillan).
- Bexell, M., Tallberg, J. & Uhlin, A. (2010) Democracy in global governance: The promises and pitfalls of transnational actors, *Global Governance*, 16(1), pp. 81–101.
- Bildt, C. & Dillon, M. (2004) Europe’s final frontier?, in C. Bildt, M. Dillon, D. Keohane, X. Pasco & T. Valasek (eds) *Europe in Space* (London: Centre for European Reform), pp. 7–18.
- Boin, A., ‘t Hart, P., Stern, E. K. & Sundelius, B. (2005) *The Politics of Crisis Management: Public Leadership Under Pressure* (Cambridge: Cambridge University Press).
- Bormann, N. & Sheehan, M. (eds) (2012) *Securing Outer Space: International Relations Theory and the Politics of Space* (London: Routledge).
- Boston, J. M., Pallot, J. & Walsh, P. (1996) *Public Management: The New Zealand Model* (Auckland: Oxford University Press).
- Bovaird, T. (2004) Public-private partnerships: From contested concept to prevalent practice, *International Review of Administrative Sciences*, 70(2), pp. 199–215.
- Bovens, M. (2007) Analysing and assessing accountability: A conceptual framework, *European Law Review*, 13(4), pp. 447–468.
- Burzykowska, A. (2009) Smaller states and the new balance of power in space, *Space Policy*, 25, pp. 187–192.
- Chen, D. D. & Macauley, M. K. (2011) Commercial space actors, in E. Sadeh (ed.) *The Politics of Space: A Survey* (London: Routledge), pp. 104–119.
- Culbertson, F. L. (1996) What’s in a name? Paper submitted to the 10th Congress of The Association of Space Explorers, <http://history.nasa.gov/SP-4225/documentation/mirmeanings.htm>.

- Cutler, C., Hauffer, V. & Porter, T. (eds) (1999) *Private Authority and International Affairs* (Albany: State University of New York Press).
- Dunn, M. (2005) The socio-political dimensions of critical information infrastructure protection (CIIP), *International Journal for Critical Infrastructure Protection*, 1(2/3), pp. 258–268.
- Dunleavy, P., Margetts, H., Bastow, S. & Tinkler, J. (2006) New public management is dead – long live digital era governance, *Journal of Public Administration Research and Theory*, 16, pp. 467–494.
- EMCC (2011) Sector futures: Defence industry, European Monitoring Centre on Change, <http://www.eurofound.europa.eu/emcc/content/source/eu06019a.htm>.
- ENISA (2011) Cooperative models for effective public private partnerships: Good practice guide (European Network and Information Security Agency (ENISA) Good Practice Guide), <http://www.enisa.europa.eu/act/res/other-areas/national-public-private-partnerships-ppps/good-practice-guide-on-cooperative-models-for-effective-ppps>.
- EOS (2009) Priorities for a future European security framework, European Organisation for Security (EOS), <http://www.eos-eu.com/LinkClick.aspx?fileticket=7nRk3CbrwKM=&tabid=239>.
- ESDA (2010) Military space: one of Europe’s weak spots, European Security and Defence Assembly, 17 June, http://www.assembly-weu.org/en/presse/cp/2010/33_2010.php.
- European Commission (2005) Report of the panel of experts on space and security, http://europa.eu.int/comm./space/news/article_2262.pdf.
- European Commission (2009) A public–private partnership on the future internet, http://ec.europa.eu/information_society/activities/foi/library/docs/fi-communication_en.pdf.
- European Commission (2010a) Commission awards major contracts to make Galileo operational to 2014, European Commission Press Release, IP/10/7, 7 January, <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/7&format=HTML&aged=0&language=EN&guiLanguage=en>.
- European Commission (2010b) Galileo: Signature of major contract leading to initial services in 2014, European Commission press release, IP/10/1382, 26 October, <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/1382&format=HTML&aged=0&language=EN&guiLanguage=en>.
- European Commission (2010c) Non-paper on the establishment of a European public–private partnership for resilience (E3PR), Version 2.0, 23 June, http://ec.europa.eu/information_society/policy/nis/docs/ep3r_workshops/3rd_june2010/2010_06_23_ep3r_nonpaper_v_2_0_final.pdf.
- European Commission (2011a) Proposal for a regulation of the European Parliament and of the Council on the implementation and exploitation of European satellite navigation systems, COM (2011) 814 final, http://ec.europa.eu/enterprise/policies/satnav/galileo/files/com-2011-814-final_en.pdf.
- European Commission (2011b) Commission awards final contracts making Galileo a reality, European Commission press release, IP/11/772, 22 June, <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/772&format=HTML&aged=0&language=EN&guiLanguage=en>.
- European Commission, DG Enterprise and Industry (2010) Space, a policy with concrete results’, E & I Magazine, 16 December, http://ec.europa.eu/enterprise/e_i/news/article_10844_en.htm.
- European Communities (2010) Study on the industrial implications in Europe of the blurring of dividing lines between security and defence, Report initiated by the European Commission, Contract no. S12.516182, authored by the Istituto Affari Internazionali (Italy) in collaboration with the Manchester Institute of Innovation Research (UK) and the Institut des Relations Internationales et Stratégiques (France), http://ec.europa.eu/enterprise/sectors/defence/files/new_defsec_final_report_en.pdf.
- European Council (2011) Council Resolution of 6 December 2011 ‘Orientations concerning added value and benefits of space for the security of European citizens’ (2011/C 377/01), <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2011:377:FULL:EN:PDF>.
- European Council (2008) Council Resolution of 26 September 2008 ‘Taking forward the European Space Policy’, *Official Journal of the European Union* (2008/C 268/01), pp. 1–16.
- European Court of Auditors (2009) The management of the Galileo Programme’s development and validation phase, Special Report No. 7, 2009. Luxembourg, <http://eca.europa.eu/portal/pls/portal/docs/1/8036724.PDF>.
- European Parliament (2008) EU Parliament Report on the European Security Strategy and ESDP (2008/2202(INI)), Committee on Foreign Affairs, <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A6-2009-0032+0+DOC+PDF+V0//EN>.
- Fergusson, J. & James, S. (2007) Report on Canada, national security and outer space, Canadian Defence and Foreign Affairs Institute, Calgary, <http://dspace.cigilibrary.org/jspui/bitstream/123456789/10336/1/Report%20on%20Canada%20National%20Security%20and%20Outer%20Space%202007.pdf?1>.
- Giemulla, E. & Heinrich, O. (2008) Haftungsrisiken und Haftungsmanagement im Sat-Nav Bereich (Galileo), *Zeitschrift für Luft- und Weltraumrecht* (German Journal of Air and Space Law), 57, pp. 25–39.

- Goh, G. M. (2007) Dispute settlement in international space law: A multi-door courthouse for outer space, Doctoral thesis, International Institute of Air & Space Law, Faculty of Law, Leiden University.
- Hall, R. B. & Biersteker, T. J. (2003) *The Emergence of Private Authority in Global Governance* (Cambridge: Cambridge University Press).
- Handberg, R. (1995) *The Future of the Space Industry: Private Enterprise and Public Policy* (Westport: Quorum Books).
- Harvey, B., Smid, H. H. F. & Pirard, T. (2010) *Emerging Space Powers: The New Space Programs of Asia, the Middle East and South America* (Chichester: Praxis Publishing and Springer).
- Hayllar, M. R. & Wettenhall, R. (2010) Public-private partnerships: Promises, politics and pitfalls, *Australian Journal of Public Administration*, 69(S1), pp. 1–7.
- Held, D. & Koenig-Archibugi, M. (eds) (2005) *Global Governance and Public Accountability* (London: Blackwell).
- Hertzfeld, H. R. (2007) Globalization, commercial space and spacepower in the USA, *Space Policy*, 23, pp. 210–220.
- Hoon Kwak, Y., Chih, Y. Y. & Ibbs, C. W. (2009) Towards a comprehensive understanding of public private partnerships for infrastructure development, *California Management Review*, 51(2), pp. 51–78.
- Howard, D. (2009) Making do with what we have: Creating certainty in private space law, Graduate thesis, Montréal, Institute of Air and Space Law, McGill University.
- Howard, D. (2008) Achieving a level playing field in space-related public-private partnerships: Can sovereign immunity upset the balance?, *Journal of Air Law & Commerce*, 73, pp. 723–757.
- Kosmo, F. (1988) The commercialization of space: A regulatory scheme that promotes commercial ventures and international responsibility, *Southern California Law Review*, 61, p. 1055.
- Larsen, P. B. (2001) Issues relating to civilian and military uses of GNSS, *Space Policy*, 17(2), pp. 111–119.
- Laudal, T. (2011) Determinants and impacts of corporate social responsibility: A market-centric approach, Doctoral thesis, Stavanger, University of Stavanger.
- Lindgreen, A. & Swaen, V. (2010) Corporate social responsibility, *International Journal of Management Reviews*, 12(1), pp. 1–7.
- Logsdon, J. M. (1992) International relationships and the U.S. space program: The missing element, *Public Administration Review*, 52(2), pp. 196–198.
- Logsdon, J. M. & Schaffer, A. M. (eds) (2005) *Perspectives on Space Security* (Washington, DC: Space Policy Institute, George Washington University).
- Lowry, B., Carter, C. & Stegall, S. (1995) *The Truth is Out There: The Official Guide to the X-Files Vol. 1* (New York: Harper Paperbacks).
- Manno, J. (1984) *Arming the Heavens: The Hidden Military Agenda for Space 1945-1995* (New York: Dodd, Mead and Co).
- Marchetti, P. G. & Biancalana, A. (eds) (2008) CEN space standardisation, EO, GMES and dual use state of play, <http://citeserx.ist.psu.edu/viewdoc/download?doi=10.1.1.155.1722&rep=rep1&type=pdf>.
- McDougall, W. A. (1985) *The Heavens and the Earth: A Political History of the Space Age* (New York: Basic Books).
- Moltz, J. C. (2008) *The Politics of Space Security: Strategic Restraint and the Pursuit of National Interests* (Stanford: Stanford University Press).
- Mörth, U. (2007) Public and private partnerships as dilemmas between efficiency and democratic accountability: The case of Galileo, *Journal of European Integration*, 29(5), pp. 601–617.
- Mörth, U. (2008) *European Public–Private Collaboration* (Cheltenham, UK: Edward Elgar).
- Moteff, J. D., Copeland, C. & Fischer, J. (2003) Critical infrastructures: What makes an infrastructure critical?, Congressional Research Service, Library of Congress, <http://www.hsdl.org/?view&did=441525>.
- Pasco, X. (2006) A European approach to space security, <http://drum.lib.umd.edu/bitstream/1903/7967/1/pasco2006.pdf>.
- PCCIP (1997) *Critical Foundations. Protecting America's Infrastructures* (The Report of the President's Commission on Critical Infrastructure Protection) (Washington, DC: PCCIP), <http://www.cyber.st.dhs.gov/docs/PCCIP%20Report%201997.pdf>.
- Pekkanen, S. M. & Kallender-Umezu, P. (2010) *In Defence of Japan: From the Market to the Military in Space Policy* (Stanford: Stanford University Press).
- Peeters, W. (2003) Space commercialization trends and consequences for the workforce, *Acta Astronautica*, 53(4-10), pp. 833–840.
- Perrow, C. (1984) *Normal Accidents: Living with High-Risk Technologies* (New York: Basic Books).
- Rosenau, J. N. (1990) *Turbulence in World Politics: A Theory of Change and Continuity* (Princeton: Princeton University Press).
- Sadeh, E. (ed.) (2011) *The Politics of Space: A Survey* (London: Routledge).
- Sadeh, E., Livingstone, D., Matula, T. & Benaroya, H. (2005) Public–private models for lunar development and commerce, *Space Policy*, 21, pp. 267–275.

- Scholte, J. A. (2005) *Globalization: A Critical Introduction*, 2nd ed. (London: Palgrave Macmillan).
- Schäferhoff, M., Campe, S. & Kaan, C. (2009) Transnational public-private partnerships in international relations: Making sense of concepts, research frameworks, and results, *International Studies Review*, 11(3), pp. 451–474.
- Seebode Waldrop, E. (2003) Integration of military and civilian space assets, Graduate thesis, Montréal, Institute of Air & Space Law, McGill University.
- Sheehan, M. (2012) Profaning the path to the sacred: The militarization of the European space program, in N. Bormann & M. Sheehan (eds) *Securing Outer Space* (London: Routledge).
- Sheehan, M. (2007) *The International Politics of Space* (London and New York: Routledge).
- Smith, L. J. & Baumann, I. (eds) (2011) *Contracting for Space: Contract Practice in the European Space Sector* (Surrey and Burlington: Ashgate).
- Smith, M. S. (2010) President Obama's national space policy: A change in tone and a focus on space sustainability, *Space Policy*, 27, pp. 20–23.
- Space Council (2010) 7th Space Council Resolution: 'Global Challenges: taking full benefit of European space systems', Council of the European Union and the Council of the European Space Agency at Ministerial Level, Brussels, 25 November, http://download.esa.int/docs/7th_Space_Council_resolution.pdf.
- Space Security Organization (2011) Space Security 2011, <http://www.spacesecurity.org/executive.summary.2011revised.PDFversion.pdf>.
- Stumbaum, M.-B. (2009) Risky business? The EU, China and dual-use technology. European Union Institute for Security Studies, <http://www.iss.europa.eu/uploads/media/op80.pdf>.
- Svedberg Helgesson, K. & Mörtz, U. (eds) (2012) *Securitization, Accountability and Risk Management: Transforming the Public Security Domain* (London: Routledge).
- Tranchetti, F. (2011) Preventing the weaponization of outer space: Is a Chinese-Russian-European common approach possible?, *Space Policy*, 27(2), pp. 81–88.
- UK Government, Department for Business, Innovation and Skills (BIS) (2010) A UK Space innovation and growth strategy 2010 to 2030, <http://www.bis.gov.uk/assets/bispartners/ukspaceagency/docs/igs/space-igs-exec-summary-and-recomm.pdf>.
- UK Government, Department of Health, Social Services and Public Safety (DHSSP) (2011) Amendments to the requirements for the approval of PFI and PPP Projects, <http://www.dhsspsni.gov.uk/hscf-2011-50.pdf>.
- UNESCO (2010) UNESCO science report 2010: The current status of science around the world, <http://unesdoc.unesco.org/images/0018/001899/189958e.pdf>.
- US Commercial Service (2008) EU funding in security research, MR-137, November, http://www.buyusainfo.net/docs/x_2090503.pdf.
- Valasek, T. (2004) Galileo's 'strategic' role, in C. Bildt, M. Dillon, D. Keohane, X. Pasco & T. Valasek (eds) *Europe in Space*, http://www.frstrategie.org/barreCompetences/espace/doc/p572_space_pol_eu.pdf.
- von der Dunk, F. G. (2010) Europe and security issues in space: The institutional setting, Space and Telecommunications Law Program Faculty Publications Paper 58, <http://digitalcommons.unl.edu/spacelaw/58/>
- Walsh, K. (1995) *Public Services and Market Mechanism: Competition, Contracting and the New Public Management* (London: Macmillan Press).
- Wettenhall, R. (2003) The rhetoric and reality of public-private partnerships, *Public Organization Review: A Global Journal*, 3(3), pp. 77–107.
- White House (1982) National space policy. National Security Decision Directive Number 42, July 4, 1982 (unclassified), (Washington, DC: The White House), <http://www.fas.org/irp/offdocs/nsdd/nsdd-42.pdf>.
- Zandee, D. (2008) Introduction by European Defence Agency (EDA) at Workshop on 'Critical Space Technologies for European Strategic Non-Dependence' Brussels, 9 September, <http://www.eda.europa.eu/genericitem.aspx?area=31&id=413>

Lindy Newlove-Eriksson is a Ph.D. candidate in the Department of Industrial Economics and Management, Division for Industrial Dynamics at the Royal Institute of Technology, Stockholm, and Adjunct Lecturer at CRISMART, the National Center for Crisis Management Research and Training in the Department of Security, Strategy and Leadership at the Swedish National Defence College in Stockholm. Newlove-Eriksson has conducted research on crisis preparedness as well as a number of crises and accidents, including the ice storm in eastern Canada in 1998, the collapsed platform accident in Talsi, Latvia in 1997 and the London bombings in 2005. She has contributed to the research, analysis and training activities at CRISMART for

over a decade as well as representing CRISMART in several European Union projects and endeavours, notably the INDIGO Crisis Management Solutions project funded by the European Commission under Framework Programme 7 (FP7), where she has contributed to project leadership and the symbology component of the project, among other things. She is co-author of *Auckland Unplugged: Coping with Critical Infrastructure Failure* (Lexington Books, 2005 with Erik K. Stern and Lina Svedin).

Johan Eriksson is Head of Research at the Swedish Institute of International Affairs and Professor of Political Science at Södertörn University, Stockholm. Eriksson received his Ph.D. from Umeå University, Sweden. He has been a Visiting Research Scholar at Columbia University and at Leiden University. He is a member of the ECPR Standing Group of International Relations Steering Committee, and has served on the board of the Nordic International Studies Association. He has lectured at universities and institutes in Canada, Italy, Finland, Norway, Denmark, and Malaysia, among others. His research interests include power and territoriality in world affairs, cyberpolitics, security, foreign policy, and the politics of expertise. He has published seven books, including the co-edited *Regulating Chemical Risks: European and Global Perspectives* (Springer, 2010, with Michael Gilek and Christina Rudén) and *International Relations and Security in the Digital Age* (Routledge, 2007, with Giampiero Giacomello). Eriksson's articles have been published in journals including the *Review of International Studies*, *International Political Science Review*, *International Studies Perspectives*, *International Studies Review*, *Cooperation and Conflict*, *Review of Policy Research*, *Foreign Policy*, and *Journal of Contingencies and Crisis Management*.

Copyright of Globalizations is the property of Routledge and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.