

Heiko Borchert (Editor), *Europas Zukunft zwischen Himmel und Erde: Weltraumpolitik für Sicherheit, Stabilität und Prosperität*, Nomos Verlag, Baden-Baden, ISBN 3-8329-1410-2, 2005, 170pp (EUR 24.90).

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Very little has been published in the German language about the security and defence applications of space and their role for political and military strategies. The present volume, the fourth in a series of publications on networked security (*Vernetzte Sicherheit*), is a major step forward in filling that gap. The series is jointly edited by Colonel Ralph Thiele, the founding director of the Centre for Transformation of the German armed forces, and since October 2005 academic director of the Bundeswehr's Command Academy in Hamburg, and by Heiko Borchert, a German-Swiss policy analyst and consultant based at the Düsseldorf Institute for Foreign and Security Policy. The title translates as "Europe's Future between Heaven and Earth: Space Policy for Security, Stability and Prosperity."

The volume's 10 chapters, written by a group of authors from a wide range of backgrounds, cover many of the key aspects to be considered in Europe and elsewhere at a time of growing practical need for space-based services for security, above all communications and surveillance. The focus is refreshingly results-oriented. Attention is paid to the need for a limited set of priorities and for taking advantage of public-private cooperation schemes and dual-use synergies to generate better space capabilities for security and defence in Europe.

In the first section of the book, Thomas Jäger and Mischa Hansel characterise the different national approaches pursued in France, Germany, Italy and the UK and assess cooperative perspectives at the EU level. Niklas Reinke analyses Europe's international space cooperation with the USA, Russia and China. Kai-Uwe Schrogl contributes an overview of the international legal framework. The core argument is presented by Heiko Borchert, who outlines the need for closer transatlantic cooperation in space for international security and homeland defence, using NATO as well as the EU's emerging security and defence structures. In his view, the progressive incorporation of advanced information and communications technology in the way security and defence operations are planned and executed has triggered a doctrinal transformation that will require European security forces to adapt, with network-enabled space components being one important new aspect that needs to be understood and included in planning, procurement and training.

This argument is driven further by Ralph Thiele, who not only presents an elaborate case for adopting a network centric approach in the German armed forces. He also points to the indispensable role of space in this context, in particular to link data from existing and new sensors and other sources, to disseminate and synergetically exploit resulting intelligence. Thus it enables integrated

situational awareness, timely and well-informed political decision making and much more effective operations. Thiele sees a need for Germany and Europe to build their own capacities, but without compromising the alliance with the USA.

The last part of the book looks in some detail at the economic aspects of implementing the proposed line of action. Martin Ripple discussed the public-private partnership models pursued in Skynet-5 and Galileo. In a particularly informative chapter, Reinhard Czichy and Heiko Borchert draw attention to the growing importance of providing services using space assets, as opposed to the more traditional focus on building hardware. Robert Haberberger and Gerd Hofschuster attempt to map the industrial and research capabilities in space-related defence technology that are pursued in various European nations, making it apparent that some fields of duplication and intense rivalry exist, e.g. in radar imagery.

The volume closes with a more technical, highly topical chapter by Achim Bachem et al. on requirements and perspectives for the acquisition of space-based synthetic aperture radar (SAR) sensors for conducting networked operations, written from an official German perspective. The paper stresses the need for standardisation in a multinational environment and presents important ideas for innovative approaches to SAR satellite constellations that optimise spatial resolution and revisit time at low cost, including tandem antenna interferometry and bi-static SAR. It also mentions possible constellations that can be operated both in active and passive mode.

The authors of this chapter recommend an integrated programme management approach that controls all aspects of the "system chain" and keeps teams together. They assert that industrial competition is neither customary nor possible in Europe beyond a certain degree. At this point, it becomes particularly clear how valuable such a publication can be in providing a basis for better mutual understanding of different engineering and management cultures in Europe as a starting point for the overdue debate on key controversial issues that stand in the way of common European strategies.