

## BOOKS &amp; ARTS

## The slow slide towards a new battlefield?

The cold war saw governments develop international policies to regulate outer space for military and civil uses. Loopholes in those policies must now be closed, writes **Roald Sagdeev**.

Satellites form an integral part of global infrastructure through their use in telecommunications, remote sensing and navigation. They have also strengthened international security. Indeed, as James Clay Moltz explores in his book *The Politics of Space Security*, space regulation has been shaped by defence interests ever since the Soviet launch of Sputnik 1 in 1957.

Sputnik did not carry any military stigma; but, as the first artificial object in space, it opened up a potential new battlefield. The US administration understood the dangers immediately. In 1958, US President Dwight D. Eisenhower wrote to Soviet Premier Nikita Khrushchev to advocate strategic restraint and the right of any country to free access to space as part of the common heritage of humankind. Yet such advocacy did not exclude the military from space altogether; after all, satellite reconnaissance from orbit could reduce the risk of a surprise attack.

It is remarkable how the leaders of that dramatic epoch chose negotiation and treaties over a display of brute force in space. Such a spirit was expressed in the National Aeronautics and Space Act legislated by US Congress in 1958: “activities in space should be devoted to peaceful purposes for the benefit of all mankind”.

In a decisive step in 1959, the United Nations established the Committee on the Peaceful Uses of Outer Space to designate the legal framework for space-related activities. In a treaty signed in 1963, the United States, the United Kingdom and the Soviet Union agreed to ban nuclear-weapons tests in the atmosphere, underwater and in space. The UN’s comprehensive Outer Space Treaty, which prohibited the space deployment of weapons of mass destruction, was adopted in 1967. Yet this treaty left open the loophole of placing conventional armaments in orbit, allowing both super-powers to develop technologies for anti-satellite weapons.

Moltz dissects the debates and battles that have taken place between those who have formulated space policy. He describes, for instance, the episode when US President John F. Kennedy got the 1963 Partial Test Ban Treaty approved by Congress despite strong opposition — including



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Will President Barack Obama fulfil his campaign promise to tackle space debris, illustrated here?

that of physicist Edward Teller. In the seemingly better times after the cold war, President Bill Clinton failed to get the US Senate to ratify the Comprehensive Test Ban Treaty, which would ban all nuclear tests.

The peak of success in regulating military activity in space was reached in 1972 at the signing of the Antiballistic Missile Treaty by the United States and the Soviet Union. It was patiently championed by the US administrations of both Lyndon B. Johnson and Richard Nixon until the Soviet Union was persuaded by arguments of strategic stability. The treaty prohibited the development and deployment of missile defences — such as the ‘Star Wars shield’ — in orbit. The regime

of deterrence was strengthened and space was left militarized, yes, but free of any weapons. The treaty even survived Ronald Reagan’s later obsession with the Strategic Defense Initiative for protecting the United States from ballistic nuclear attack.

Steady technological progress made navigation from space possible, Moltz explains. Signals sent by Global Positioning System (GPS) satellites, operated by the US Air Force, have been freely available since 1995. That fulfilled the promise Reagan made in 1983 after a Korean Air flight was shot down by the Soviet Air Force in an incident allegedly caused by navigation error. For the military, GPS provides greater navigational accuracy for targeting weapons; hence sci-fi writer Arthur C. Clarke’s description of the first Iraqi campaign as “the first space war”.

With George W. Bush’s 2001 arrival in

**The Politics of Space Security:  
Strategic Restraint and the Pursuit of  
National Interests**

by James Clay Moltz

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the White House, the mix of technological exuberance and triumphalism, born of the United States' superiority in space, started to challenge the old paradigm of space security based on an international legal regime. The first signal of change came in January 2001 from a US commission on space security, chaired by Donald Rumsfeld before he became defence secretary. Warning that the United States could one day face a "space Pearl Harbor" — a devastating surprise attack on its strategically important space assets — the commission members wanted to ensure "that the President will have the option to deploy weapons in space to deter threats to, and if necessary, defend against attacks on US interests".

Rumsfeld presided over several Pentagon activities that prepared arguments for the full-spectrum use of force in space. Thus, the Air Force Space Command described in its 2004 Strategic Master Plan the possibility of using anti-satellite weapons, or even weapons that could be deployed in space to target objects on Earth. Most controversial was the US withdrawal in 2001 from the international Antiballistic Missile Treaty, which had by then been in force for three decades.

The existing set of space laws has loopholes. It does not restrict conventional weapons in space that could destroy or damage orbiting satellites. Satellites are extremely vulnerable even to primitive attacks, such as being hit at high speed by a projectile, and anti-satellite weapons exploit this fragility. Such weapons were not added to military arsenals during the cold war. However, both sides have kept open the possibility of developing these weapons to gain superiority, while each fearing that the other will overtake technologically.

To close these loopholes, experts are calling for the introduction of 'rules of the road' for orbital traffic, the prohibition of all weapons in space, the testing and deployment of anti-satellite weapons on the ground and support for international arrangements to mitigate the growing risk from space debris to assets in orbit.

China and Russia, for example, have tried during the past few years to introduce an initiative to ban space weapons in the UN Conference on Disarmament. The United States, with almost a lone voice, has blocked this discussion. China's test of an anti-satellite weapon in 2007 increased the pressure to act, and demonstrated that not everyone is ready to accept the space dominance of one country.

The collision in February this year of an active US telecommunications satellite from the Iridium constellation with a long-dead Russian one adds an alarm call. Introducing regulations that require satellites to be de-orbited

at the end of their active life would need international cooperation and exchange of information on orbital traffic and debris. As with military threats, the United States has most to lose in an unregulated environment because it has the greatest presence in space.

A regulatory regime for orbiting objects can be introduced in various ways. An international law to ban space weapons, adopted by the UN, would offer a radical solution. In the interim, a regime of restraint could be agreed among those countries that are active in space. A precedent is the Missile Technology Control Regime — a voluntary association of 34 countries that has been promoted by the United States and others since the end of the cold war. Governments could also pledge not to place weapons in orbit.

Moltz ends on a pessimistic note: the long and difficult political battle to come. Proponents of space-based weaponry point to risks from North Korea, a nation seemingly embracing both nuclear weapons and seeking orbital capability. Iran's nuclear and rocket development is cited as another potential threat. However, the debate is changing thanks to the rapid rise of civilian space applications.

Satellite networks for telecommunications, remote sensing and navigation are effectively global utilities. Space exploration today is also largely carried out by international collaboration, whether the mission is to Mars or the Moon. The presence of the International Space Station, which brought together the former adversaries of the cold war, itself safeguards against space becoming a battleground.

The rise of Barack Obama to the highest political orbit brings new hope. Promises he made during his presidential campaign include pursuing international negotiations to minimize space debris and banning the weaponization of space. He has declared that "the United States must show leadership by engaging other nations in discussions of how best to stop the slow slide towards a new battlefield". Such leadership is urgently needed. ■

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## The return path to the Moon

### The Seventh Landing: Going Back to the Moon, This Time to Stay

by Michael Carroll

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In *The Seventh Landing*, Michael Carroll adeptly lays out NASA's strategy for returning to the Moon, establishing a permanent outpost there, and, if all goes well, pushing on to Mars. It is a complex and ambitious undertaking, requiring a new fleet of launch vehicles, an updated crew module, a more versatile lunar lander, sophisticated all-terrain vehicles, souped-up spacesuits, lunar habitats and enough acronyms to make your head explode. Fortunately, using straightforward reportage, coupled with his own stunning space art, Carroll brings compelling order to what could have been a chaotic romp.

NASA's goal is to get moon boots on lunar soil by the year 2020. But to do so, milestones must be passed on schedule. The maiden flight of the booster rocket, Ares I, which will loft the crew module, *Orion*, into orbit, is scheduled for early 2013. *Orion*, which will accommodate a crew of up to six, may fly its first manned mission to the International Space Station by 2015. The more powerful Ares V booster will carry

the lunar lander, named *Altair*, into Earth orbit. After docking with the crew module, the booster's upper stage will haul both *Orion* and *Altair* to the Moon. Ares V's maiden flight is scheduled for 2018. Deadlines, hardware and mission details are in flux but, Carroll recognizes, "the overarching goals, strategies and inspiration for the seventh landing will not change".

Those sentiments, however, may not go unsullied. Even now, under a directive by US President Barack Obama, a committee of ten aerospace executives, astronauts, engineers, scientists and a retired general are taking a down-to-earth look at the United States' space exploration strategies (*Nature* 459, 1038–1039; 2009). Particularly sobering are the budget constraints on completing both the *Orion* module and the Ares V booster. Reservations from scientists about the value of a return to the Moon have also reached the committee's ears. Their report, which chairman Norman Augustine asserts will be unblinking in its findings, will be released in August.

After looking back at early robotic lunar missions such as the *Luna* and *Ranger* series and then the *Apollo* programme, Carroll shifts the focus from our lunar history to our potential lunar future and the justification for that