

## **Crowded Orbits: Conflict and Cooperation in Space**

By James Clay Moltz

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*“A central question about future civil space activities—such as human missions to Mars or major robotic missions to distant planets—is this: are new forms of cooperation likely to emerge, or are past competitive practices likely to reassert themselves?”<sup>1</sup>*

Out of sight, out of mind—so the saying goes. Space technology, however, though situated far beyond the naked eye and quietly out of reach, is all around us. Today, satellites track our positions on the planet through GPS systems, and they provide the means by which we instantly communicate with one another from anywhere around the globe. From Congressional hearings to Cold War politics, the space age has an intriguing history wrapped around the complexities of political maneuvering and international relations. In *Crowded Orbits*, James Clay Moltz explores the history of space technology, how it was shaped by international conflict, and how it may potentially bring fresh new hope for international *cooperation*.

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<sup>1</sup> JAMES CLAY MOLTZ, *CROWDED ORBITS: CONFLICT AND COOPERATION IN SPACE* 59-60 (Columbia Univ. Press, 2014).

accomplished author in the field of space law and politics. In addition to *Crowded Orbits*, some of his other recent scholarship includes *Asia's Space Race* (2011), *The Politics of Space Security* (2008), and *Nuclear Weapons and Nonproliferation* (2007). He has also written for journals including *Current History* and *Nature*, and his articles have been published in the *New York Times*, the *Boston Globe*, and elsewhere.

The title of *Crowded Orbits* is derived from humanity's 20th century climb into space, which saw an outflux of ballistic missiles, satellites, and other space vehicles from nations all around the globe. The more well-known and "glamorous" side of the space age is touched on briefly in *Crowded Orbits*—the 1960s race to the moon, the Hubble telescope, the Mars *Curiosity* rover, the *New Horizons* probe, and so forth.<sup>2</sup> However, the bulk of this work focuses on the early days of space technology, the current state of affairs, and what the future potentially holds. What many people back on earth do not realize is how instrumental the space age has been for a number of our most important technologies—cell phones, GPS systems, and even U.S. missile defense systems. For those who *do* comprehend the impact of the space race, fewer have truly appreciated the *conflict* from which these developments arose.

*Crowded Orbits* draws out the logical progression from missiles and space boosters in World War II to commercial technology in the 21st century. Moltz spends the first two chapters describing how the allied and axis powers of World War II began experimenting with new missile technologies. Using rockets that could fly into low orbit above the earth, both sides of the war benefited from designing weapons with increased range. These rockets had poor accuracy, however, giving rise to the first challenge of rocket technology: how to make them

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<sup>2</sup> See MOLTZ, *supra* note 1, at 67-68 (discussing several observational NASA missions to various planets and even the Sun, several of which are cooperative efforts with the European Space Agency and Russia). As of Moltz's writing, the *New Horizons* probe had not yet reached Pluto. *Id.* New technologies for a more sophisticated telescope, called the James Webb Telescope, are also being developed between NASA, the ESA, and the Canadian Space Agency. *Id.*

more efficient. The days of space technology began quite rocky, as both sides were motivated by competition for a strategic edge. In chapter two, however, Moltz explains how both the U.S. and the Soviet Union—the primary players in the Cold War conflict—were instrumental in Then, in chapters three and four, Moltz explains how the systems which were once used to wage war were later used to send satellites into space. These systems have been critical building blocks into many of our modern day communications systems, national defense systems, and—perhaps one day—even *planetary* defense systems.

The idea of planetary defense, which Moltz takes up in his third chapter, is hardly exclusive to science fiction like *Star Trek*.<sup>3</sup> Indeed, one of the gravest concerns among scientists at NASA is the threat of asteroids passing close to earth. Even at small sizes, these so-called Near-Earth Objects (“NEOs”) pose a high risk to populated areas. In 1908, for example, a meteorite crashed into Siberia, levelling about 850 square miles of forest. Outlining the gravity of this threat, Moltz explains how meteors even 50 feet in diameter are enough to cause catastrophic damage.<sup>4</sup> The concept of “planetary defense” may draw skepticism, but one can imagine how another incident like Siberia would devastate more densely-habited regions of the world. That is exactly how experts see the problem at NASA, which has sharply increased expenditures on planetary defense in the last several years. Other space agencies share NASA’s concern, including the European Space Agency (“ESA”) and their counterparts in China and Russia. This is critical in understanding one of the reasons why international cooperation becomes so important; once we leave earth’s atmosphere, humanity’s interests become more

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<sup>3</sup> See, e.g., *Star Trek Enterprise: The Expanse* (Paramount Network Television May 21, 2003) (exemplifying the need for planetary defense in age of inter-stellar conflict); *Star Trek Deep Space Nine: Homefront* (Paramount Domestic Television Jan. 1, 1996) (addressing planet-wide security in a time of inter-stellar war).

<sup>4</sup> See MOLTZ, *supra* note 1, at 85-86 (describing NEOs in the context of planetary defense).

focused. As Moltz explains, even the United States and Russia have more in common in the vacuum of space than on the surface of the planet itself.

However, the precise direction that future space relations will take is unclear. It remains to be seen just *how* cooperative humanity can truly be while in orbit. Despite some common shared interests between NASA, the ESA, and other space agencies, the fact remains that their respective nations remain *competitors*. As long as conflict exists on earth, full cooperation in space may not be completely realistic. Moltz explores this in greater depth in chapter five, as he explores the uses of space technology for military purposes. On one level, space technology makes general military operations on the surface more efficient. On another, nations like the U.S. prepare for future conflict by arming themselves with space weapons, including anti-satellite (“ASAT”) systems. This is not limited to just “space-to-space” weapons, but also space-to-earth weapons, including anti-ballistic defense systems. Thus as long as the world beneath it remains in conflict, it would be naïve to say nations in orbit will reach the utopian vision of Star Trek in the near future.

Moltz also explains how recent decades have seen the proliferation of commercial space technology. In chapter four, he explains how the government-dominated industry opened up to the private sector. By creating a market in high-resolution satellite images in the 1980s, the French were the first to allow commercial actors to gain a foothold in space. This pressured other nations, including the U.S., to declassify their technologies.<sup>5</sup> During the 1990s, Russia became a leader in the international commercial market, fueling the competition. Then in more recent years, startups in the United States became more active, including Space Exploration Technologies (SpaceX) and XCOR Aerospace. Broadly speaking, space commerce has also expanded to include geolocation and navigation services—commonly known as GPS. Moltz

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<sup>5</sup> See MOLTZ, *supra* note 1, at 95 (elucidating on the initial commercial exposure of space technology).

goes into great depth at examining these developments and more. From space mining to geostationary orbital positions and radio interference, an increase in competition and a higher volume of actors on the grid are ushering in an exciting (albeit complicated) era for space.

Perhaps most intriguing to Moltz's analysis is his account of how the space age is raising a variety of legal questions. For better or for worse, wherever mankind goes, the law follows. (As Matt Damon humorously put it in *The Martian*, the surface of Mars is technically regulated by maritime law.<sup>6</sup>) Chapters six and seven both delve into the future of space law and how technology will impact international affairs. Antiquated treaties and modern-day gridlock in space governance are creating fertile ground for new resolutions. The urge for transparency and a viable code of conduct between nations is attempting to provide a solution to some of these issues, and even the U.S. has offered to consider self-imposed legal controls if they serve national interests.<sup>7</sup> At any rate, it seems in Moltz's opinion that the future of space law, diplomacy, and security will depend on the quality of these treaties and the development of international institutions. Just as new laws were necessary at the advent of air travel, so too will space travel require new standards for safety and acceptable behavior. This will require negotiations, treaties, and a vast array of resources from actors with enough political influence to usher in the *new* space age.<sup>8</sup>

For those interested in international law and conflict resolution in space, *Crowded Orbits* leaves nothing to be desired. It sheds light on a lesser-known field of law, while presenting the reader with important questions to consider going forward. With the emergence of more sophisticated space technologies that can bring mankind into orbit with greater ease and higher frequency, what rules will govern space travel? What role will the ISS play in future cooperative

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<sup>6</sup> THE MARTIAN (20th Century Fox 2015).

<sup>7</sup> See MOLTZ, *supra* note 1, at 163 (pointing to potential solutions to the current gridlock in space).

<sup>8</sup> See MOLTZ, *supra* note 1, at 184-85 ().

efforts? Furthermore, how is liability handled when accidents occur—when objects fall from orbit, or when debris from one nation’s satellite damages the equipment of another? How do these questions become complicated when private actors like SpaceX get involved? Moltz spends considerable time discussing these matters. There are lengthy discussions to be had about international law, commercial law, and tort liability, making *Crowded Orbits* a must-read for anyone with an interest in how technology has shaped the space age.