

# Preface

By any modern standards of human endeavor and research, communications made possible by global navigation satellite systems and space transportation stand preeminent in the wonderment they offer. What began as exploration of outer space in the nineteen fifties and sixties is now full blown tourism in space. Added to that is the startling possibility of the existence of life in outer space which makes us not only think but wonder in amazement. Stephen Hawking – one of the world’s most eminent and knowledgeable physicists – has stated that in a universe with 100 billion galaxies, each containing hundreds of millions of stars, it is unlikely that life forms are present only on Earth. Hawking has also said:

To my mathematical brain, the numbers alone make thinking about aliens perfectly rational... the real challenge is working out what aliens might actually be like<sup>1</sup> ... I imagine they might exist in massive ships, having used up all the resources from their home planet. Such advanced aliens would perhaps become nomads, looking to conquer and colonize whatever planets they can reach.<sup>2</sup>

Against this bewildering backdrop, we continue to use and explore outer space, take pictures, calculate trajectories of planets and determine who owns the moon and what the purpose of outer space exploration is. An added dimension is the use of aerospace in terrestrial transportation where an aerospace plane will take off as an aircraft, go into orbit, enter the atmosphere using the Earth’s orbit into its destination, cutting the travel time significantly. It is said that by using this method, air travel time can be reduced drastically. For instance, a journey by air between Los Angeles and Sydney, which would now take 14 to 16 hours by conventional air travel, could take 2 hours or less. None of these technological feats would be possible without the advancement of information technology and computerized knowledge-sharing. However, with the advancement of this technology would also come the threat of cyber terrorism, which is a real cause of concern to astronomical science and space travel.

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<sup>1</sup><http://www.timesonline.co.uk/tol/news/science/space/article7107207.ece#cid=OTC-RSS&attr=797084>.

<sup>2</sup><http://www.telegraph.co.uk/science/space/7631252/Stephen-Hawking-alien-life-is-out-there-scientist-warns.html>.

In March 1998, the web site of the National Aeronautics and Space Administration (NASA) of the United States received a “denial of service” attack, calculated to affect Microsoft Windows NT and Windows 95 operating systems.<sup>3</sup> These attacks prevented servers from answering network connections; crashed computers, causing a blue screen to appear on the computers. The attacked systems were revived, but this attack was a follow up of one in February of the same year, when, for two weeks the US Defense Department had unclassified networks penetrated, where hackers accessed personnel and payroll information.

Cyber-terrorism has the advantage of anonymity, which enables the hacker to obviate checkpoints or any physical evidence being traceable to him or her. It is a low budget form of terrorism where the only costs entailed in interfering with the computer programs of a space programme would be those pertaining to the right computer equipment.

Any interference with a space program of a nation, which would be inextricably linked to peaceful uses of outer space, would tantamount to an act of terrorism performed against international peace. The maintenance of international peace and security is an important objective of the United Nations,<sup>4</sup> which recognizes one of its purposes as being *inter alia*:

To maintain international peace and security, and to that end: take effective collective measures for the prevention and removal of threats to the peace, and for the suppression of acts of aggression or other breaches of peace, and to bring about by peaceful means, and in conformity with the principles of justice and international law, adjustment or settlement of international disputes or situations which might lead to a breach of the peace.<sup>5</sup>

It is clear that the United Nations has recognized the application of the principles of international law as an integral part of maintaining international peace and security and avoiding situations which may lead to a breach of the peace.<sup>6</sup>

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<sup>3</sup><http://mgrossmanlaw.com/articles/1999/>. Charter of the United Nations and Statute of the International Court of Justice, Department of Public Information, United Nations, New York, DPI/511 – 40108 (3-90), 100M at 1.

<sup>4</sup>Charter of the United Nations and Statute of the International Court of Justice, Department of Public Information, United Nations, New York, DPI/511 – 40108 (3-90), 100M at 1.

<sup>5</sup>Charter of the United Nations and Statute of the International Court of Justice, Department of Public Information, United Nations, New York, DPI/511 – 40108 (3-90), 100M at 3.

<sup>6</sup>On 17 November 1989 the United Nations General Assembly adopted Resolution 44/23 which declared that the period 1990-1999 be designated as the United Nations Decade of International Law (the full text of Resolution 44/23 is annexed as Appendix 1 at the end of the text of this thesis). The main purposes of the decade have been identified *inter alia* as:

- (a) The promotion of the acceptance of the principles of international law and respect therefore
- (b) The promotion of the means and methods for the peaceful settlement of disputes between States including resort to the international Court of Justice with full respect therefore
- (c) The full encouragement of the progressive development of international law and its codification
- (d) The encouragement of the teaching, studying, dissemination and wider appreciation of international law

No treatise on space transportation should be without a discussion on the relationship between air travel and space travel in the particular context of the legal regimes and political commonalities that apply. Therefore, against the variegated background of bewilderment and cautious optimism that space transportation offers, this book begins with an exposé on international politics, the principles of which bear upon space transportation and the closeness of air space and outer space and activities that straddle both frontiers at the same time. It discusses current issues and possibilities of communications and transportation in outer space as well as the liabilities and accountability of the key players of space exploration.

Montreal, QC, Canada  
30 August 2010

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## Reference

Abeyratne RIR (1992) The United Nations decade of international law. *Int J Polit Cult Soc* 5(3):511–523

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The four tasks of the Resolution have been predicated upon the fact that the purpose of the United Nations is to maintain peace and security. See Resolutions and Decisions Adopted by the General Assembly During its Forty Fourth Session, Vol. 1, 19 Sept – 29 Dec 1989, General Assembly Official Records: Forty Fourth Session, Supplement No. 49 (A/44/49), United Nations, New York, 1990, 31. For a detailed discussion on Resolution 44/23 see Abeyratne (1992), pp. 511–523.



<http://www.springer.com/978-3-642-16701-0>

Space Security Law

Abeyratne, R.

2011, XII, 166 p., Hardcover

ISBN: 978-3-642-16701-0