As an astronaut I never expected to be interested in, let alone involved in, space law – which is of course what this book is all about. But that was back when I was the payload and not the purveyor. I got my big toe wet back in the 1970s when my responsibility shifted to remote sensing and I began brushing up against the permissible/impermissible boundaries of image resolution, access and ownership. Recently my work in protecting earth from asteroid impacts led me into the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and a full body dunking into the deep waters of international space law. The shifting of impact zones across the earth’s surface in the process of removing them from the planet, the inherent liabilities in the event of a malfunction during deflection, the potential use of weapons of mass destruction technologies to avoid a global catastrophe, and the contending geopolitical self-interests of the nations involved sent me screaming for a legal life preserver!

And there, via intermediary friends, was Frans von der Dunk, calmly, with great Dutch dignity, standing on the legal shoreline prepared to hurl me a bright orange life preserver. We became close friends and Frans, with his thoughtful insights and great depth in space law became an essential and increasingly productive member of our planetary defence team.

Our ‘team’ is a bit too glib a descriptor perhaps. Back in 2001 a number of scientists, engineers and astronauts gathered at the Johnson Space Center to wrestle with the frightening fact that astronomers were discovering increasing numbers of asteroids whose earth-crossing orbits made them potential impact threats. Yet no one was addressing whether anything could be done when we inevitably discovered one on an impact trajectory. After concluding that indeed current space technology could enable, with adequate early warning, the deflection of an asteroid from such an impact, we formed a non-profit public charity (B612 Foundation) to explore the technical issues involved and hopefully develop concepts and techniques to materialize the capability.

It was almost immediately obvious, as our research illuminated the physical (especially geographical) implications of asteroid deflection that there were huge geopolitical consequences unavoidably embedded in the
process. Difficult social and political choices, including the need for threshold criteria involving public safety, liability and cost needed to be addressed. And how to ensure that the interests of individual states, or even private space entrepreneurs, would be properly aligned in the process? Most choices, however, rested well outside the technical arena. It slowly became obvious to those of us involved that preventing an asteroid impact would indeed properly be a collective worldwide action. Ultimately I came to understand that this unprecedented yet inevitable act would be the first instance of humanity collectively reordering (ever so slightly) the shape of the solar system in order to enhance human survival. Taking the difficult choices which lie ahead to the United Nations became mandatory.

In 2005 I realized that my best shot for gaining the necessary attention of the international community to the sticky decisions necessary to initiate a deflection campaign was to enrol the Association of Space Explorers (ASE) in garnering high-level political attention. While astronauts and cosmonauts are wonderful keys to opening otherwise-locked political doors, one needs to be prepared with impressive substance in order to prevent those doors from (politely) slamming shut, shortly thereafter, in one’s face. Hence, in 2006 we enrolled, inter alia, Peter Jankowitsch, Frans von der Dunk, and other eminently qualified international diplomatic and legal experts in organizing and illuminating the geopolitical choices and decisions which would confront the international community when an impact threat materialized.

It was in the process of developing our report (www.space-explorers.org/ATACGR.pdf) to the UN COPUOS action team on Near Earth Objects (NEOs) that I came to appreciate the depth of the international legal challenges of the issue and the wisdom and collective experience of the Panel on Asteroid Threat Mitigation (PATM) that we pulled together to sound the trumpet within COPUOS. That report, delivered to the Scientific and Technical Subcommittee of COPUOS in 2009, has slowly worked its way to the General Assembly (December 2013) and now back to COPUOS for growing flesh on the skeletal bones thus far assembled.

Science fiction has a wonderful record of early warning for later realization in the space biz. Albeit perhaps grossly simplified, the early insights and ideas of Arthur Clarke et al nevertheless opened the minds of future scientists, engineers, and yes, even lawyers (!) – at least to the extent they understood and were able to communicate with the scientists and the engineers – to the reality of current and future human use of our space environment. Thus far, while providing military benefits to many nations, space has proven to be a questionable venue for the positioning
of weapons. But the spectre ever lurks in the near background, and my
work in planetary defence (preventing asteroid impacts) hovers on that
threshold. Asteroids, in human scale, are massive objects and tweaking
their orbits to protect life on earth requires the use of energy levels in
space that, directed otherwise, potentially threaten that same life. Nuclear
explosions and directed energy devices may well be required to divert an
earthward-bound asteroid, and assuring the wise and judicious use of
such powerful instruments is a challenge for the international regime,
political and legal.

Nor is planetary defence the only emerging challenge for the field.
Asteroids have become something of a space hula hoop. The United
States is currently leading an initiative to bring a small asteroid, or a
boulder from a larger one, back to earth/moon space for astronauts and
researchers to meddle with. A mini-space version of bringing the
mountain to Mohammed, as it were. Inherent in this Asteroid Redirect
Mission of NASA’s, likely with international participation, rests a bundle
of asteroid-associated benefits: human exploration, science, planetary
defence, and space resource utilization. Each of these, with the possible
exception of science, is brimming with legal unknowns and precedents.
And though no single book, legal or otherwise, will be able to address all
those comprehensively, I would hope this particular book at least will
provide a major tool in the legal toolkit and point the lawyers – as well as
some scientists, engineers or politicians – in the right directions.

Beyond the ‘official’ (read governmental) programmes lies the boiling
sea of private space initiatives. And the tide is rising … fast! Private
launch vehicles and spacecraft of many kinds for both people and cargo
are proliferating. Equally diverse and innovative are the people devising,
funding and participating in all this turmoil. The simmering soup of
future space objects ranges from one-way human missions to Mars to
international passengers popping up to the edge of space; from private,
deep space telescopes in solar orbit, to flocks of mini-telescopes spying
the ground below and even swarms of pico-sats controlled by university
students. With all the hyperactive, entrepreneurial minds generating this
Bolero-like crescendo, international space law seems destined for excit-
ing times indeed!

In homage to the collection of nations which made possible my flight
into space on Apollo 9 in the spring of 1969 I carried with me copies of
the Outer Space Treaty, the UN Declaration of Human Rights and (a bit
more self-serving) the Return of Astronauts (‘Rescue’) Agreement. I
knew little at the time of the intensive collective effort that went into
producing these seminal agreements of the early space years. In the years
since my astronaut days ended I have come to appreciate the subtle,
powerful influence the work of many creative legal minds imprinted on our collective understanding of the ‘common heritage’ of humanity … the space environment into which we were born and now operate. But like all frontiers in the past, this one will be filled to the brim with surprises.

The intellectual front lines of the coming skirmishes along this new frontier will doubtless be populated by the readers of this Handbook of Space Law. Just as the book offers a multi-angular approach to the various main issues involved, the increasing diversity and audaciousness of the entrepreneurs in the emerging space arena will require a matching multi-dimensional cast of space lawyers. Hopefully they will be more credibly prepared for the challenges ahead than the lawyer-statistician who advised his client to always carry a bomb when he flew since the probability of encountering two bombs on any single flight was incredibly remote. Wise and thoughtful, sometimes out-of-the-box, but pragmatic thinking will definitely be in order and welcomed.

Standing philosophically above the fray one can surely anticipate that the opening of space exploration to a younger and less entrenched set of creative minds will inevitably result in dramatic leaps forward … and backward. The human future will doubtless be powerfully shaped, perhaps enabled by, the manner in which the inevitable intersections of limited interests are handled in this process. At its core the practice of law, space law included, brings to human evolution the collective wisdom of enabling experience. We are all in this together. Our future will clearly be shaped by the collective integrity of our actions as we move outward into the cosmic environment. My conviction is that the essence of insights into historic human behaviour represented in the law, applied with imagination to the present, will enable an exciting and open-ended human evolution.

Rusty Schweickart
Apollo 9