

SPECIAL COMMENT

Reclining in the summer's evening light, comfortable in our mismatched beach chairs, my friends and I lean back to watch the darkening sky. Venus sits bright near the horizon, and overhead Sirius, the brightest of all stars, begins to push its sparkle through the fading sunlight. We talk quietly, clutching our beers and glasses of wine, and wait.

Suddenly, someone cries out. 'There, above the oak tree, headed north!'. We all strain our eyes, trying to spot the small speck of light hurtling across the sky. Voices ring out as we each see the satellite, and heads swivel to try and be the first to see another. Bets are made, successes tallied, and laughter rings out into the night.

For millennia, others before us have watched the night sky, staring with wonder at the endless ocean of stars. Imaginations have soared up into the universe, seeing great constellations, learning the patterns, finding meaning in the randomness. Understanding the sky led to development of a calendar, to Stonehenge, to the Pyramids, and eventually to the stunning realization that we are not the centre of it all.

In the past forty-five years we have not only stared and wondered, but have actually begun to travel into that night sky. The small points of light speeding overhead are human creations, satellites of Earth, fledgling probes into the endless unknown. Some have travelled further, exploring the other planets, even venturing beyond Pluto. These robotic extensions of our own senses have allowed us to start to directly experience and understand the rest of the universe.

Yet our probing of the sky has by no means been purely scientific and peaceful. Countless satellites have been launched for military surveillance, and the world's first Space Station was armed with a space-to-space gun.

Efforts and treaties have been made to minimize the weaponization of space, but any success thus far has mostly been due to the very inaccessibility of getting to orbit. The cost and complexity of leaving Earth has limited access to the very few, and thus has kept the more base applications at bay.

In the near future, however, we will invent cheaper ways to launch. While this will allow widespread opportunity for peaceful exploitation and profit, it will also open space to many more nations of the world, regardless of stability and intent. The onus will then be even greater on peaceful nations and international organizations to press for responsible stewardship of what John Magee called 'the high untrespassed sanctity of space'.

We will not be completely successful. Humanity has never been peacefully united on the ground, and there is no reason to think we will behave differently just because we are higher up. But the current advantages of worldwide communication, high-speed travel and the fallen Iron Curtain combine to give us a historic opportunity.

There is more cooperation in space exploration than ever before. Satellite customers can choose from launchers all over the world. The huge Atlas V rocket recently launched from Florida used a Russian-made main engine. The Space Shuttle and Soyuz regularly carry multinational crews, and high overhead the International Space Station shines as a beacon of hope, built by sixteen of the world's leading nations, crewed by citizens of Earth.

There is much romanticism about outer space. The generation of children that saw Sputnik and Apollo have since grown up, carrying with them the youthful optimism and hopes of the era, and I am one of them. We desire a universe better than the world we have developed. Yet I am also a Colonel in the Air Force, and clearly see the benefits of taking advantage of the high ground.

As I sit in my lawn chair and look at the sky, however, I am optimistic. Just twenty months ago I was in space, doing a spacewalk outside the Space Station. There was a quiet moment during the assembly work when I gently eased away from the side of the Station, floating free, barely holding on to a flimsy fabric strap. On my right I stared at the vast, ever-unrolling beauty of Mother Earth, while on my left the darkness and promise of the rest of the universe endlessly beckoned. Joining the two was the massive, powerful form of the Space Station—a human creation that let me see something we've been imagining for thousands of years.

Our job, as the current caretakers of the planet and civilization we have been given, is to use our greatest capabilities to solve our greatest problems. If we can give the opportunity to as many people as possible to float free, to see a world without boundaries and a universe without end, it will benefit us all.

After writing this piece, Columbia and her crew were lost on re-entry over Texas. It leaves me with great sadness, and all of us with an irreplaceable loss. It also clearly shows the danger and complexity of space exploration, and gives us the imperative to work harder, and to learn from this horrific lesson how to avoid such a disaster in the future. As each of the fallen crew would tell you, exploration of the rest of Creation is fraught with complexity, challenge and risk, yet the benefit of understanding is infinitely worth the cost. *Per Ardua ad Astra.*

Colonel Chris A. Hadfield

Canadian Space Agency Astronaut

NASA Director of Operations, Star City, Russian Federation