



Saudi Space Debris Conference 2024

Stewart Bain Founder and CEO NorthStar Earth & Space – Keynote Address

*“O for a muse of fire to ascend the brightest heaven of invention. A kingdom for a stage, princes to act, and monarchs to behold the swelling scene.”*

These words from the prologue of William Shakespeare’s history of Henry V written around 1599 hold as true today as they did over four hundred years ago. Here, in the Kingdom of Saudi Arabia with dignitaries and leaders from around the world facing we face a rapidly expanding problem of space debris. And what of this “muse of fire”? Is it the sun illuminating the objects in space so that we can track them? Or is it the bright light from the rockets that carry our missions to outer space? Or is it our hopes as they rise to the skies and give us optimism for a brighter future for those that will follow in our footsteps?

During this first Conference on Space Debris here in Riyadh, many keynote speakers have so eloquently captured the sentiment of the environmental challenge we are all facing in space. It is an existential threat to our economy and our future. In 2012, I quietly accepted this challenge with my partners, when we created NorthStar Earth & Space.

Our fundamental approach was to answer a question: “How can one effectively monitor over 300 trillion cubic kilometers of the entire near-Earth Space environment from LEO to beyond GEO to accurately calculate the trajectories of countless resident space objects and better predict their ephemerides thus improving the precision of space navigation and reducing the probability of collisions?” This question is the gift that keeps on giving as I emphatically argue it is the questions that we dare to pose that define us while the outcomes or the technology that we produce are merely an extension of our own humanity.

With this, NorthStar developed a unique concept of operations and combined this with proprietary algorithms to deliver our unique space-based, space situational awareness service. This high-powered tool was designed for future generations as a means to navigate space and their future within it.



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Twenty-four satellites in polar sun-synchronous orbits specifically oriented to benefit from sun's rays to naturally illuminate the countless resident space objects and allow NorthStar to observe them as streaks of light as they pass across our multiple optical sensors capturing their movements in two dimensions while our algorithms convert them to an accurate three-dimensional map of space.

The launch of NorthStar's first four satellites on January 31, 2024, represents a historic first for space and space-based Space Situational Awareness as it opens the door to a new age of possibilities to preserve, protect, and for humanity to sustainably grow within this final frontier of limitless economic and scientific potential.

Saudi is the first nation in the Middle East to go to space. They have the highest performance 5G connectivity in the world as well as the world's highest performance connectivity on roads and infrastructure. These are among several recent and remarkable achievements made within four short years of the Saudi Vision 2030 plan. Now, we are challenged to imagine what else can be achieved by bringing the world together and adding the dimension of Space to this landscape?

NorthStar's contribution is a GPS-like system for space. Consider the parallels to the GPS system developed in the 1970's and the deeply profound influence it now has on our economy. With the launch of our space situational system, all of this has been awakened and is within our grasp to contribute to a thriving and more sustainable space environment.

The Saudi Space Agency honours NorthStar and our entire space community with this gracious and generous gift of hospitality given from the heart that I am sure must have been strongly influenced by His Excellency Mohammed Al Tamimi's stay in Glasgow, Scotland, my family's hometown, while he completed his Master's studies at Strathclyde University.

I wish to honour this remarkable gift of perfect sentiment with a commitment from NorthStar to join with the Saudi Space Agency, your community, and the world to make every effort to support your goals for a better space environment and the inevitable challenges they will present.



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To be humble and honest, NorthStar’s gift is our team, it is our curiosity, our innovation, our intellectual property, and our unwavering commitment to resolve this global challenge.

At NorthStar, we have always upheld the philosophy that the challenge of protecting & preserving the space environment is a global challenge that requires a community and global cooperation to conquer. It is inspiring to see this echoed here in the Middle East with such an audience from around the world.

With our sights firmly fixed on the “BIG PLAY” that lies just beyond the current challenges presented by space debris wherein NorthStar’s services will facilitate a thriving economy in space by precisely interconnecting countless satellites and services that will be driven by high performance systems with state-of-the-art data, analytics, high-speed interconnectivity, machine learning, and artificial intelligence, we are sobered by this immediate and unavoidable existential “right of passage” to earn our place in space rather than simply dominate its pristine setting.

Space was and will never be there for the taking, it is not ours to take. We are graced with its presence and must respect its majestic gift with our actions. What we do in this life echoes in eternity, said the Roman philosopher and leader Marcus Aurelius.

The test is “us” and the price of accessing space depends on us to get out of our own way. The compelling question now centres on our ability to step out of our respective ego’s both individually and collectively and to meditate on the supreme value of our interdependence.

Inspired by the ancient Buddhist meditations on sunyata, the concept of nothing, or zero. As an individual I am nothing in this universe without my interdependence on others and all sentient beings. I am here on this planet for a fleeting moment and gone. As our old friend Shakespeare wrote, *“life’s but a walking shadow, a poor player that struts and frets his hour upon the stage and then is heard no more.”*

And so, let's perform. Let performance be our measure to supporting one another with humility and respect. In this way we will be able to bring our individual gifts to the table to complete the puzzles and solve these current and future riddles.

Saudi's Vision 2030 is bold and ambitious. For me, it embraces the ideal of always doing better, going farther, and achieving more. It honours its past with a bright and sustainable future. Let this light, or as Shakespeare would say, our muse of fire, be our guide. Just as we witnessed at last evening's gala dinner the lengthy hard fought historic battles that defined this country, this global assembly must recognize that we are the warriors of our time and future generations are relying on us to conquer these challenges so they may enjoy space and all its magnificent wonders.

Let this be our sustainable narrative that future generations will echo of our exploits and endeavours....

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