SpaceLink Internship
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Aerospace Engineering

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The Company

SpaceLink, a subsidiary of Electro Optic Systems, provides data-relay services for low Earth orbit satellites. They are a new company, created in late 2020. SpaceLink is based in McLean, Virginia.
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Activities

While interning for SpaceLink, I worked on creating an interactive animated model of the company's satellites in orbit in a geomodelling software called Cesium Ion. The only prior model SpaceLink had of their system was the diagram below (right). To create an animated model in Cesium, I had to learn Python. The first few weeks of the internship involved teaching myself Python with Mr. Nemeth's help. After browsing various simulation software, we settled on Cesium Ion. I then had to learn how to use Cesium and its .czml file formatting. The rest of the internship entailed writing a Python program to automatically create a .czml file from raw satellite data to upload to Cesium. This file included all the details of the satellites, including their position in orbit around Earth at a given time and their individual connections to the six ground stations SpaceLink has worldwide. Much of my time with SpaceLink has involved refining this simulation to account for correct orbit positions and connection links.

Impact

By turning raw satellite data into an interactive animated model, I will help customers, vendors, and engineers gain insight into and a visualization of the SpaceLink system. The model I create will likely be included on SpaceLink's main website. It adds far more visual detail than the diagram does, as it allows people to track the satellites over the course of a day in orbit. They will be able to see the satellite connect to each ground station and "relay" its data. If you want to see this simulation in action, please scan the QR code below or ask for the link.

Future Work

I thoroughly enjoyed my internship with SpaceLink. Although I completed my simulation of SpaceLink's four satellites, the Python program can be updated to account for more satellites and/or more ground stations. I will continue to edit the code to account for any of these new cases.
After interning with SpaceLink this semester, I am very excited to work in the aerospace industry. SpaceLink gave me a glimpse into the possibilities aerospace can bring by providing me with hands-on experience. The internship taught me programming skills in Python and Cesium Ion, a useful tool that I may use in upcoming projects. I hope to take the many skills I have learned throughout the internship and apply them to my future endeavors.
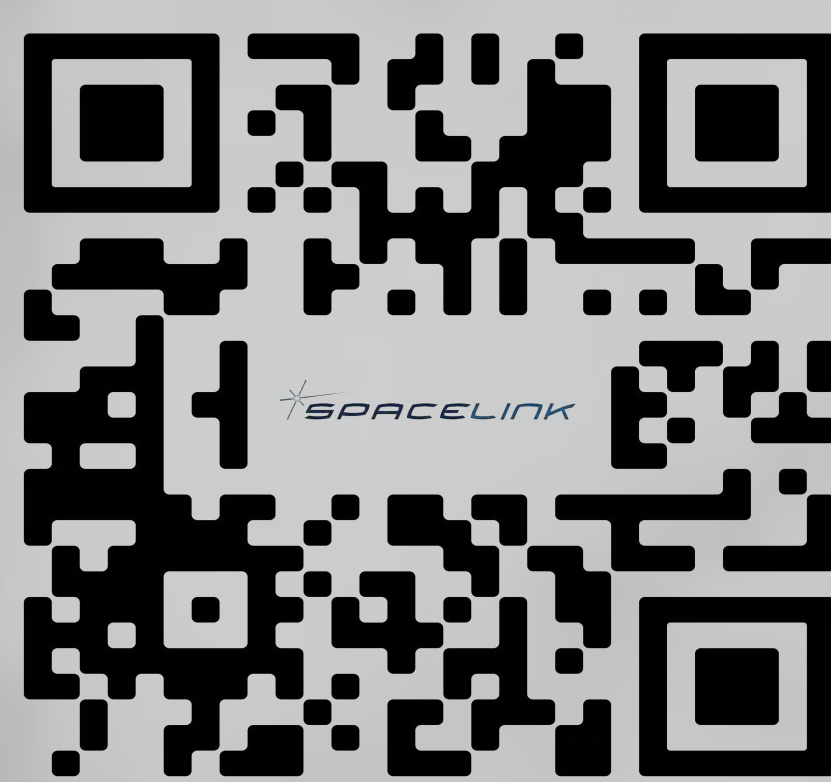
Acknowledgements

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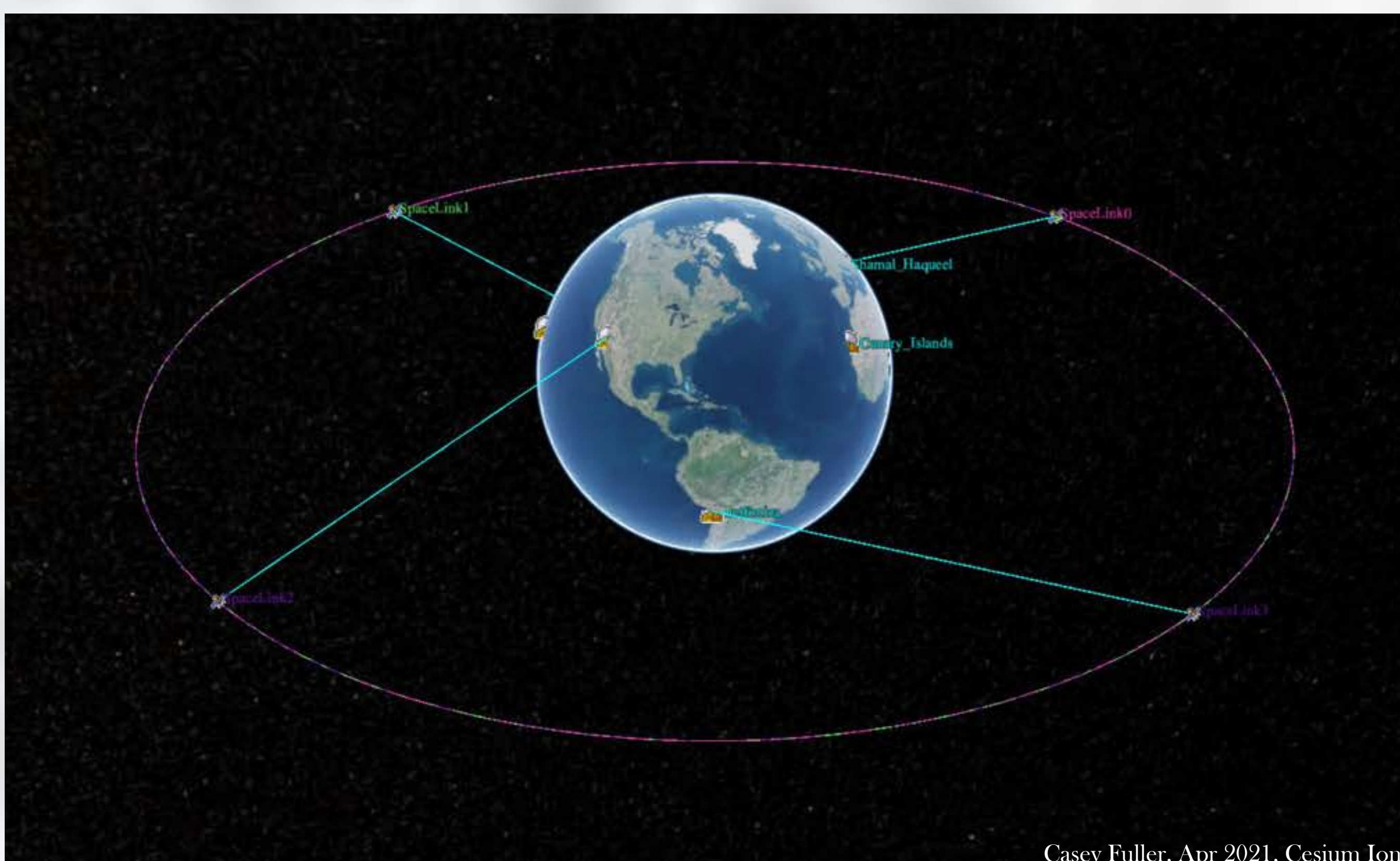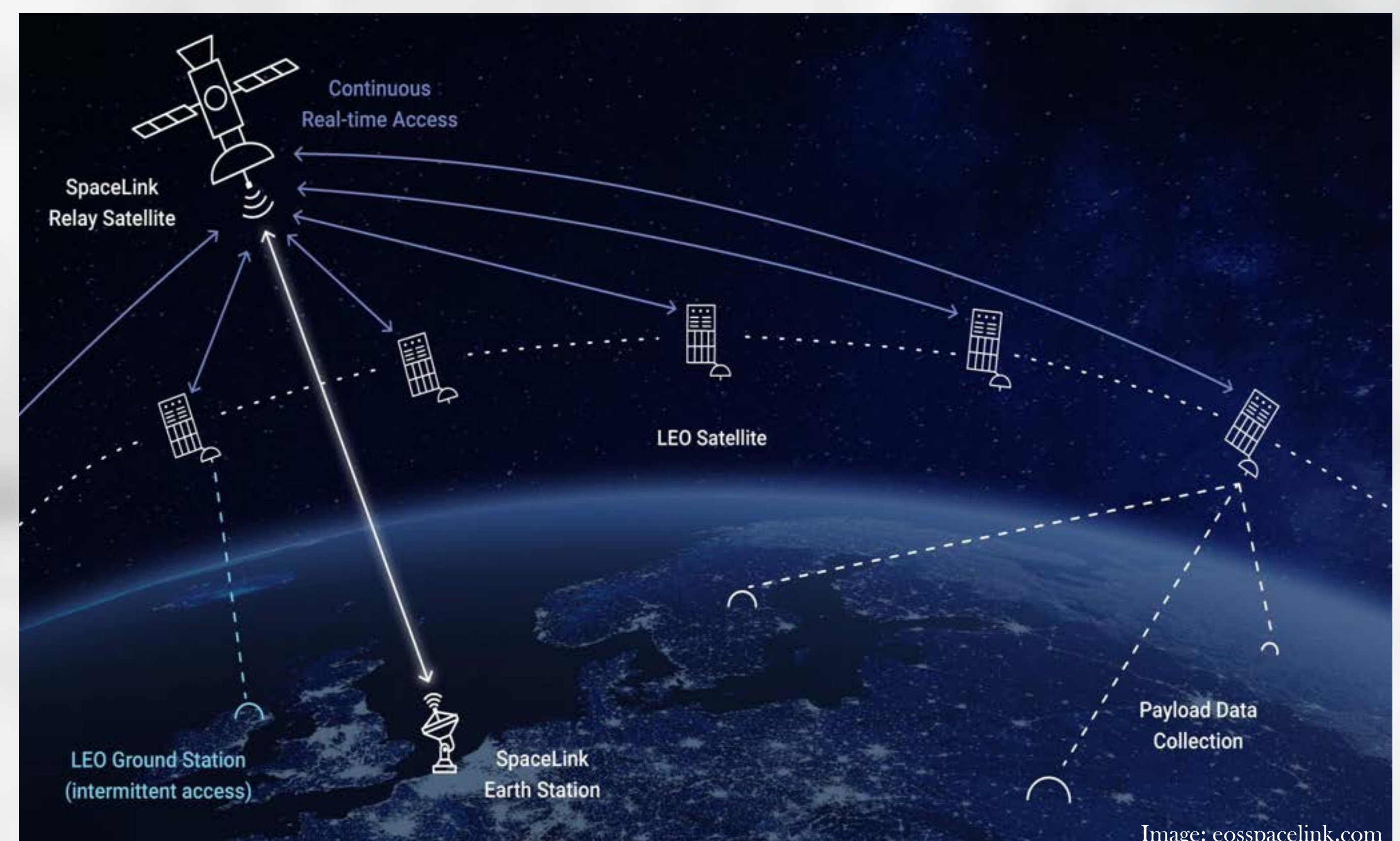

Casey Fuller, Apr 2021, Cesium Ion