Understanding the Anthropogenic Space Object Population

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MAE Seminar Series

In 1957, humanity, by way of the Soviet Union, launched its first Anthropogenic Space Object, aka Sputnik, and the space era began. Now, in 2023, we track approximately 30 to 40 thousand ASOs ranging in size from a cell phone all the way up to the space station. Many ASOs are detectable but not trackable, and below our believed detection threshold, it is believed that the population goes up to about 1 million, with sizes between the cell phone and a speck of paint. The ASOs are not in random orbital neighborhoods, which are finite, and the materials from which they are made from are also finite. However, their physical traits, such as size, shape, orientation, and material properties are mostly unknown. Moreover, most of these objects, because they're defunct or fragments, are unable to transmit their identity. This in context of sparse data, exacerbates the challenge in conducting a statistical census of the ASO population and quantifying its nature, behavior, and evolution. Prof. Jah will provide his assessment of this topic, highlight technical gaps and challenges, and afford possible solutions to mitigate those gaps.

Moriba K. Jah received a BS (1999) from Embry-Riddle Aeronautical University and an MS (2001) and PhD (2005) from the University of Colorado at Boulder. He is currently an associate professor in the Department of Aerospace Engineering and Engineering Mechanics at the University of Texas at Austin and serves as director of the Computational Astronautical Sciences and Technologies group within the Oden Institute for Computational Engineering and Sciences. Jah has also held positions at the Air Force Research Laboratory, and worked as a spacecraft navigator for NASA's Jet Propulsion Laboratory in Pasadena, CA. He is a co-founder and chief scientist at Privateer, a private space company, and a recipient of the 2022 MacArthur Fellowship ("Genius Award").

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