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Using the Aurora to Remote Sense Near-Earth Space

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The Earth's magnetosphere is formed by the interaction of the solar wind and Earth's magnetic field. Sitting like a giant wind sock in the solar wind, the magnetosphere is an enormous and dynamic region. The processes at work within the magnetosphere serve as exemplars of phenomena that happen throughout the cosmos, and have consequences in the upper atmosphere. One of those is the aurora, a truly global and multi-scale phenomenon that we are only beginning to understand. Of all the countries on Earth, Canada has the largest region of land under the auroral zone, something Canadian scientists have capitalized on for more than fifty years. In this talk, I will outline how we use observations of the aurora to remote sense the magnetosphere, focusing on Canadian ground-based and space-based programs that provide remarkable images of this beautiful natural phenomenon.