Seeing the Invisible

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We have all heard the expression the "vacuum of space". But space is full of particles, waves, and fields. We just cannot see them. We will show how space scientists are able to make them visible and explain a variety of interesting phenomena. We will start with the solar wind that blows off of our star. The interaction of the solar wind with the Earth's magnetic field produces a region around the Earth referred to as the magnetosphere. The Earth's magnetic field forms a shield protecting life on Earth. But our shield is imperfect. The wind blows the magnetic field into a comet-like tail behind the Earth. Some of the particles that penetrate our shield produce the beautiful Aurora Borealis. They also create magnetic storms which can damage our satellites and produce currents in the Earth that are a threat to our power grids. We will show pictures and movies and explain the techniques used to see and study this fascinating region around the Earth. We will also show similar phenomena on other planets in our solar system and at the interface between the solar system and interstellar space.