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EDITORIAL

Behind the Aurora Borealis

When was the last time you thought about the Earth's magnetic field? Or, for that matter, the solar wind? Perhaps now is a good time to do so.

Last year, NASA launched a constellation of five new satellites to investigate substorms — celestial events caused when the Earth's magnetic field captures energy from the solar wind and then releases it. Data from the satellites and ground observations show that the Earth's magnetic field lines — stretched well into space by the solar wind — suddenly snap back into place like giant rubber bands and shower the planet with solar particles. As astronomers have recently reported, that sudden release of energy is what causes the northern lights to flicker and dance.

If you have ever seen the northern lights, you know they cause a wonder that is itself a kind of question. We're used to clouds sliding past on a windy day and the steady, predictable movements of celestial objects. But there is something startling about the aurora borealis, and not least its unpredictability. To see great sinuous sheets of light towering over the dark horizon is to feel that some fundamental force is being illuminated in the most diaphanous of ways. Until now, the cause of the aurora's sudden shifts in mood was unclear. Now we know.

Perhaps it's better simply to say that now astronomers know. What we get to do instead is imagine. The next time you see the northern lights, you'll be able to imagine immense lines of magnetism reaching toward the moon, capturing the solar wind as if they were sails, and then spilling the wind's particles into Earth's atmosphere. What we are seeing, in a sense, is the last iridescence of a particle-breeze blowing outward from the Sun. **End Copyright New York Times**