



**Ronald E. Hatcher**  
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***Magnetic Explosions in the Plasma Universe***

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**ABSTRACT:**

Natural phenomena such as solar or stellar flares or the Northern lights that suddenly brighten the skies are explosions in which a large amount of magnetic energy is suddenly released, and converted to particle energies and flows with dramatic consequences for space weather. It is widely believed that these events are caused by magnetic reconnection in plasmas, which are the “fourth state” of matter (beyond the three states, solid, liquid and gas). Magnetic reconnection is the process by which magnetic fields, which permeate plasmas, often behave as rubber strings, break and rejoin, releasing tension that builds up over time. Over the last few decades, we have made significant progress in understanding this process through a combination of laboratory and space experiments, computer simulations, and theory, but there are many questions that we do not have answers for yet.

**BIOGRAPHY:**

Amitava Bhattacharjee is Professor of Astrophysical Sciences at Princeton University and Head of the Theory Department at PPPL. One of his favorite activities is talking about physics to people who are curious.