Rolling the Dice: Monte Carlo Simulations of Pulsars and FRBs

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Abstract: Monte Carlo simulations represent an attractive means to model complex systems and are, of course, widely used in physics and astronomy. Much of my career has been spent working with students and collaborators on using Monte Carlo techniques to model the observational biases and underlying physics of Galactic neutron stars and, latterly, cosmological fast radio bursts (FRBs). in this talk, I describe four recent projects that I have carried out with students in this arena which aim to investigate: (i) the repeating population of FRBs; (ii) whether all FRBs repeat; (iii) the connection between pulsars and unidentified Fermi gamma-ray sources; (iv) the contribution of millisecond pulsars to diffuse gamma-ray emission from Galactic globular clusters. I conclude with a look ahead to possible projects in the future.

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