What do climate change and quantum mechanics have in common? Computer simulation is an essential approach for each, but both suffer from the same seemingly insurmountable obstacle: straightforward algorithms require exponentially large computer resources. For climate change, the origin is chaos, which makes the tiniest errors huge over time. For quantum mechanics, the origin is the huge number of dimensions needed to describe a many particle quantum system. Overcoming these obstacles requires clever algorithms. One of the most powerful approaches, the Monte Carlo method, can be applied to both climate simulation and quantum mechanics. In this talk I’ll start with the basic ideas of chaos and quantum mechanics, and proceed to how one simulates them, what the problems are, and how they can be overcome. A highlight will be a home movie where I demonstrate the idea of chaos at a pool table.