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Title: From toy model neuron to consciousness
Abstract: Human-level consciousness is among the greatest mysteries of all time. How can we ever hope to understand the complex processes involved, considering the human brain has close to 86 billion neurons and every neuron has around 10000 synapses? There are many parallels between artificial neural networks and our brains, but where do they differ? A key aspect of consciousness lies in the observation that it is inherently a time-involved or dynamical process. We will see how the very simplest of dynamical neuron models might tell us something about human consciousness. Along the way, I will take you through the fundamentals of nonlinear dynamics, the science of "how stuff changes", introducing stability, excitability, oscillators, attractors, gradient systems, chaos and other dynamical phenomena that are ubiquitous in every aspect of nature.