Noncommutative formulation of classical mechanics

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Classical mechanics can be cast in a framework that represents observables as operators and states as vectors in some Hilbert space, as shown by Koopman and von Neumann. In such a formulation, noncommuting operators naturally arise and the question of their physical interpretation is relevant for understanding both classical and quantum mechanics. We describe a general map from ordinary phase-space variables to operators for classical theories, and discuss its usefulness and physical relevance.

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