Title: Integrable systems in mechanics and geometry
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Abstract:

Most real-world phenomena are modeled by nonlinear differential equations. These equations are in many cases quite simple but are notoriously hard to solve. In fact, a typical nonlinear equation cannot be solved explicitly in any reasonable sense, and neither can we understand the qualitative behavior of its solutions. There are, however, very rare exceptions, namely equations which do behave in a very regular way despite their nonlinearity. Those are known as integrable systems. I will give a general overview of this area, mainly concentrating on concrete remarkable examples from mechanics and geometry, such as the Kovalevskaya top and the pentagram map. I will also try to explain what type of problems people in this area work on, with examples from my own research.