



Geometric Quantum Mechanics - Foundations and Applications

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The wonderful development of digital and nanoscale technology over the past twenty years has led to a new wave of interest in quantum-information-processing technologies. A goal of crucial relevance is to build a comprehensive understanding of how complex (many-body and out-of-equilibrium) quantum systems can exchange, store and process information. This is a huge, community-wide, effort that requires both experimental and theoretical advances. It is therefore appropriate to aim beyond the existing paradigms and tools of analysis to explore new ways of understanding quantum phenomena. I will argue that Geometric Quantum Mechanics (GQM) is one such promising way. GQM is a formulation of quantum mechanics based on differential geometry, with interesting implications, new tools of analysis, and, most importantly, new ways of thinking about quantum phenomena. In two upcoming seminars, I will provide a bird's-eye-view of GQM. In the first one, I will discuss its historical development, present its fundamental tools and discuss its physical relevance. In the second one, I will present four recent applications of GQM to complex quantum systems: Geometric Quantum Thermodynamics, Quantum Information Theory, Kinetic Theory of Information Transport, and the Emergence of Classicality.



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su temi inerenti alla Gravità Quantistica.
Responsabile: Prof. Benedetto Militello*