Record Nr. UNINA9910349516703321 Autore Shahandeh Farid Titolo Quantum Correlations: A Modern Augmentation / / by Farid Shahandeh Cham:,: Springer International Publishing:,: Imprint: Springer,, Pubbl/distr/stampa 2019 3-030-24120-3 **ISBN** Edizione [1st ed. 2019.] Descrizione fisica 1 online resource (179 pages) Collana Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5053 530.12 Disciplina Soggetti Quantum theory Mathematical physics Quantum computers **Spintronics Quantum Physics** Mathematical Applications in the Physical Sciences Quantum Computing Quantum Information Technology, Spintronics Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di contenuto Preliminaries -- The Resource Theory of Entanglement -- Generalized Quantum Correlations in Discrete Variable Systems -- Generalized Quantum Correlations in Continuous Variable Systems -- Conclusion and Outlook. Sommario/riassunto The correlations between physical systems provide significant information about their collective behaviour - information that is used as a resource in many applications, e.g. communication protocols. However, when it comes to the exploitation of such correlations in the quantum world, identification of the associated 'resource' is extremely challenging and a matter of debate in the quantum community. This dissertation describes three key results on the identification, detection. and quantification of quantum correlations. It starts with an extensive and accessible introduction to the mathematical and physical grounds

for the various definitions of quantum correlations. It subsequently focusses on introducing a novel unified picture of quantum correlations

by taking a modern resource-theoretic position. The results show that this novel concept plays a crucial role in the performance of collaborative quantum computations that is not captured by the standard textbook approaches. Further, this new perspective provides a deeper understanding of the quantum-classical boundary and paves the way towards establishing a resource theory of quantum computations.