

Mathematical Questions and Challenges in Quantum Electrodynamics and its Applications

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Abstract

This workshop is devoted to mathematical foundations and applications of quantum electrodynamics (QED). Though QED belongs to one of the most successful achievements of modern physics it is still full of difficult challenges such as the problems related to the infrared and ultraviolet divergences, justifications of effective many-body descriptions, and scattering theory. During the last years much effort has been invested in developing mathematical machinery for QED, with significant success in the low energy regime and on-going progress in the high energy one.

The goal of this workshop is to discuss topical mathematical problems and latest developments in QED ranging from its foundations to applications, in particular in the fields of: high and low energy QED, persistent models, external field QED, many-body fermion systems and quantum information, optics, transport, and control.

MSC: 13 Mathematical Physics, 9 Operator Algebras and Functional Analysis, 10 Probability and Statistics, 11 Partial Differential Equations.