

When Light Scatters Light: From the Heisenberg-Euler Effective Action to High-Intensity Lasers at CALA

Content

Light-by-light scattering, a purely quantum and nonlinear prediction of Quantum Electrodynamics (QED), has represented both a theoretical and experimental challenge since the formulation of the Heisenberg-Euler effective action. In this talk, a historical review of the development of QED will be presented, focusing on the phenomenon of light-by-light scattering. Subsequently, the Worldline Formalism will be introduced as a robust alternative to perturbation theory based on Feynman diagrams. The computational advantages of this method for simplifying the calculation of scattering amplitudes will be highlighted. Finally, an overview of the experimental efforts to measure this elusive effect will be offered, ranging from the earliest searches to the current research frontier using ultra-high intensity lasers at facilities such as the Center for Advanced Laser Applications (CALA)

Summary

Primary author(s) : Dr. MATA, Moctezuma (Posdoc)

Presenter(s) : Dr. MATA, Moctezuma (Posdoc)