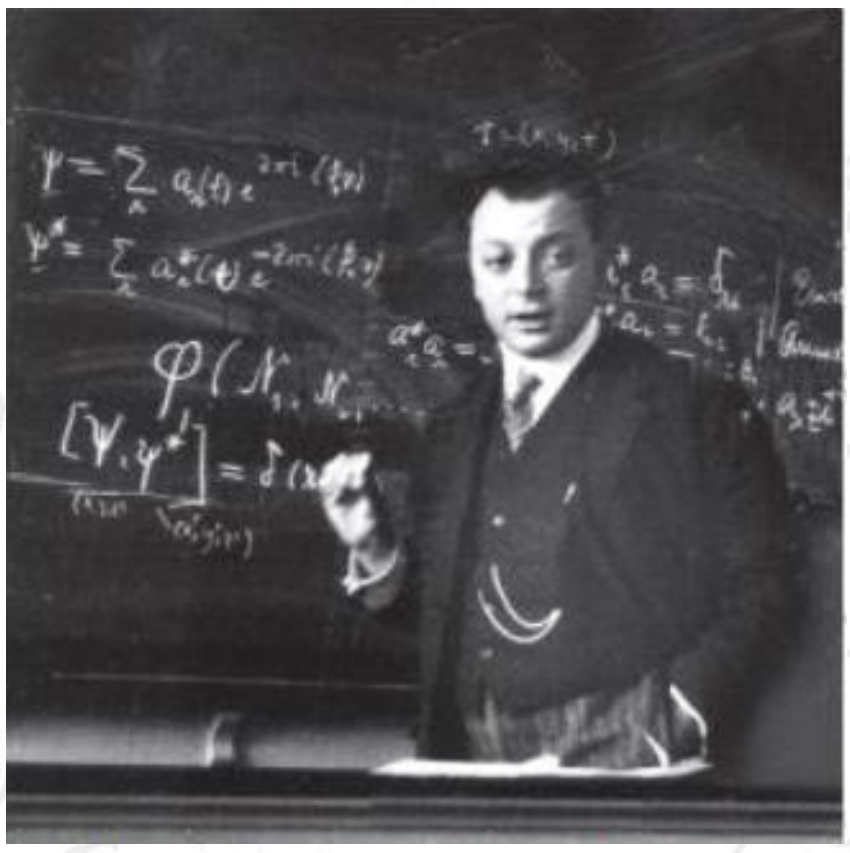
WOLFGANG PAULI CENTRE

Interdisciplinary centre for theoretical physics

WPC Colloquium

7 May 2025

2 pm
DESY Hamburg, CFEL



Intense Light Matter Interactions: from Quantum Optics to Topology

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Abstract:

For more than three decades, harmonic generation has been the cornerstone of attosecond technology, culminating in the Physics Nobel Prize in 2023. The quantum nature of the material response to light has never been in doubt, but the generated light has always been treated classically. Can quantum matter dynamics underlying this process, triggered and controlled by the classical incident light, be mapped onto the quantum properties of the generated harmonic light? It appears that the answer is "yes". I will present our latest results on controlled generation of quantum light in resonant atomic gases and in quantum systems coupled to structured photonic continua, such as atoms inside a waveguide. I also hope to show how intense shaped light can be used to induce nontrivial topological properties in two-dimensional solids, and how harmonic generation can be used to sense this topological change.

More information

https://indico.desy.de/event/46814

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