



Physikalisches Kolloquium

Thursday, 09.11.2023, 16:15, HS 100

Reception with coffee & cookies 16:00

(For university staff: please bring your own cup for sustainability reasons)

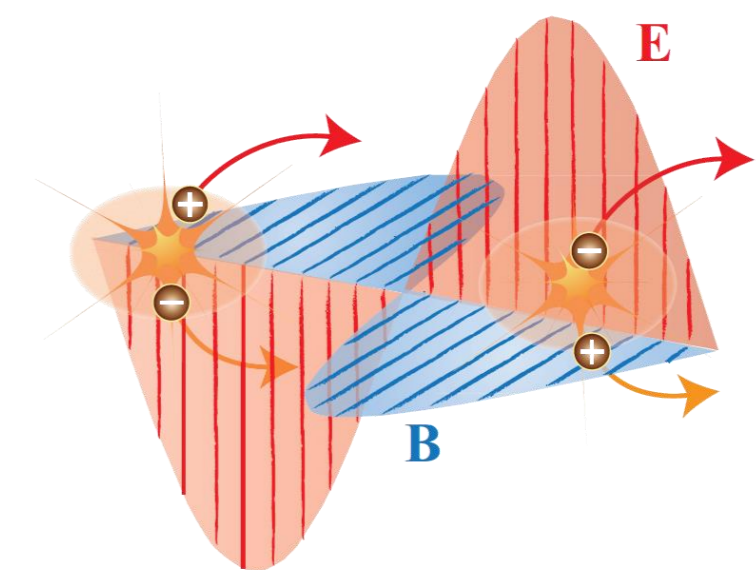
Prof. Dr. Gerd Leuchs, Max Planck Institute for the Science of Light,
Erlangen:

Maxwell's equation and the virtual elementary particles in the vacuum

Abstract

In our perception of the world, there is no void, no empty space. The pure vacuum can be viewed as a combination of a polarizable dielectric and a magnetizable diamagnetic medium. Quantum electrodynamics postulates Maxwell's equation axiomatically leading to Dirac's equation and adds the interaction between the field and electrons. This includes a nonlinear interaction of light with the vacuum. The linear response of the vacuum to an electromagnetic field is already contained in Maxwell's equations [1]. I will show, how this establishes a close link between classical optics and particle physics.

[1] G. Leuchs, M. Hawton, L.L. Sánchez-Soto, Physical Mechanism Underpinning the vacuum permittivity, *Physics* **5**, 179 (2023)



All of you interested in physics are cordially invited!

Contact: Prof. Dr. Johann Peter Reithmaier, Technical Physics, More Information: uni-kassel.de/go/physikalisches_kolloquium