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DDES - DUT Differential Equations Seminar
Seminar Room 114
9:00am - 9:45am, Thursday, April 23, 2026

Maxwell's equations

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Abstract. Maxwell's equations are a coupled system of four partial differential equations, which describe the electromagnetic field: Coulomb's law describes electrostatics, Gauß's law describes magnetostatics, Faraday's law describes the evolution of the electric field and Ampére's law describes the evolution of the magnetic field. Maxwell's equations are both interesting from a mathematical and physical perspective: A suitable combination results in wave equations for the electromagnetic field with their speed matching exactly that of light, which historically first showed that light is in fact an electromagnetic wave. Maxwell's equations therefore serve as a prime example of the connection between elegant mathematics and physical phenomena. Formulating them shows the key applications of vector analysis, their generlization in differential forms and a path to decouple partial differential equations to then transform differential relations into algebraic relations, which can be solved easier.

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- **2021 – 2025:** M.Sc. in Mathematics, University of Augsburg, Germany.
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Research Interests: Differential Geometry, (Higher) Category Theory, (Relativistic) Quantum Field Theory and General Relaticity.