



Im

Oberseminar Partielle Differentialgleichungen

gibt es am

Donnerstag, dem 04. Juli 2013,

einen Vortrag von

Prof. Dr. Rainer Picard

(Universität Dresden):

*“The Structure of Electromagnetic Wave Propagation and
Related Phenomena”*

Beginn: **15:15 Uhr**

Raum: **F 426**

Interessenten sind herzlich willkommen!

H. Freistühler, R. Racke, O. Schnürer

Abstract: Maxwell's equations will be embedded into a general class of well-posed linear evolutionary problems, which turns out to be spacious enough for the discussion of coupling phenomena of electro-magnetic waves with other (linearized) phenomena (multiphysics). It is demonstrated that these problems share a common structure, which is in the simplest case of the form

$$(\partial_0 M_0 + M_1 + A)U = F,$$

where ∂_0 denotes the time-derivative, A is a skew-selfadjoint operator and M_0, M_1 are suitable bounded operators in a Hilbert space H . The complexity of physical phenomena appear as encoded in the corresponding material law

$$M(\partial_0^{-1}) = M_0 + \partial_0^{-1} M_1.$$

The usefulness of this structural perspective is illustrated by applications to various coupled systems, such as the Maxwell-Bloch and the Maxwell-Dirac systems.

Literatur

- 1 R. Picard and D. F. McGhee. *Partial Differential Equations: A unified Hilbert Space Approach*, volume 55 of *De Gruyter Expositions in Mathematics*. De Gruyter. Berlin, New York. 518 p., 2011.
- 2 Mother2012 R. Picard. *Mother Operators and their Descendants*, Technical report, TU Dresden, arXiv:1203.6762v2, 2012. In press: *JMAA* (2013), doi:10.1016/j.jmaa2013.02.004