

Eugene Wigner Colloquium

joint event of GRK 1558 and SFB 910



Prof. Arnd Scheel

University of Minnesota

“Coherent Structures in Nonlocal Equations”

I'll present recent work on pulses and fronts in systems with nonlocal coupling. I'll first discuss pinning and unpinning of fronts. Near the Maxwell point, that is, when potential energies of the asymptotic states are close, interfaces are often discontinuous and cannot propagate: they are pinned. I'll describe results that characterize pinning regions in parameter space and show that speeds obey an unusual but universal $\mu^{3/2}$ asymptotic which is different from conventional $\mu^{1/2}$ asymptotics in discrete systems. I'll also give some motivation and speculation how speed asymptotics may depend in a universal fashion on kernel regularity properties.

In the second part of the talk, I'll explore some of the techniques involved in the study of such traveling wave problems. In particular, I'll explain how 'spatial dynamics' tools can be 'translated' to traveling-wave problems that cannot be cast as differential equations in a spatial variable. As an application, I'll describe the construction of an excitation pulse in a nonlocal FitzHugh-Nagumo equation.

Thursday, 12.05.16 · 16:15h · EW 202

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