UNIVERSITÄT DES SAARLANDES
Fakultät für Mathematik und Informatik
Fachrichtung Mathematik

Mathematisches Kolloquium

Am Freitag, dem 20. Januar 2017 spricht um 14 Uhr c. t. im Hörsaal IV der Fachrichtung Mathematik (Gebäude E2 4)

Prof. Dr. Armin Lechleiter
Universität Bremen

über das Thema:

Inside-Outside Duality and Inverse Scattering: What the eigenvalues of the far field operator tell you about the scatterer's resonances!

Abstract: A typical non-destructive testing scenario is the illumination of an unknown workpiece by waves to measure the resulting scattered wave field by a couple of sensors. The simplest mathematical model for this setting are measurements of the far field of all scattered waves for all incident plane waves. These measurements are the so-called far field pattern of the unknown scatterer and inverse scattering problems typically try to compute information on the scatterer from this quantity. The far field pattern can be used as kernel of a linear integral operator, which is the so-called far field operator. This makes it possible to use tools from functional analysis to analyze inverse scattering problems. For instance, the far field operator can be shown to be normal whenever the scatterer is non-absorbing. The eigenvalues depend on the waves' frequency and, for fixed frequency, tend to 'zero from one side'. (We explain what this means in the talk.) The inside-outside duality is the following curious statement: If some eigenvalue tends to zero 'from the wrong side' as one increases the frequency, then this specific frequency is an interior eigenvalue of the scatterer. Interestingly, this behavior can be observed for all non-absorbing scattering scenarios.

Der Gast wird von Prof. Dr. Thomas Schuster betreut.

Alle Interessenten sind zum Vortrag herzlich eingeladen.

Kaffee und Tee ab 13.45 Uhr im Konferenzraum der Mathematik (Erdgeschoss, Raum 103)

Die Dozenten der Mathematik