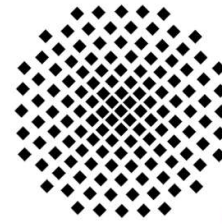# Stuttgarter Physikalisches Kolloquium

Fachbereich Physik, Universität Stuttgart
Max-Planck-Institut für Festkörperforschung
Max-Planck-Institut für Intelligente Systeme

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Dienstag, 14. April 2020	16:15 Uhr	Hörsaal V 57.01

Universität Stuttgart, Pfaffenwaldring 57, 70569 Stuttgart-Vaihingen

Gastgeber: Prof. Dr. Harald Giessen, Universität Stuttgart, Telefon: 0711 - 685-65111

How to tie an optical field into a knot

Mark Dennis
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Abstract

Tying a knot in a piece of string can be a hard practical problem. It seems even harder to tie a *field* into a knot — say a function from real 3-dimensional space to the complex numbers such that the function is zero on a curve which is a given knot or link. Nevertheless, several ways of doing this have been proposed in recent years, linking several areas in modern optics such as optical vortices, position-dependent polarization, optical helicity and tightly-focused beams. I will discuss recent progress in this area, including creating laser beams containing a variety of different knots and links, detecting knottedness in random speckle fields and relations with knots in other systems such as fluids, nuclear physics and quantum chaos. I will conclude with some comparisons with 3D topological textures and skyrmions.