



Universität Stuttgart • Pfaffenwaldring 57 • 70569 Stuttgart  
Fakultät Mathematik Physik

## Einladung

zur öffentlichen Antrittsvorlesung

von Herrn apl. Professor Dr. rer. nat. Wolf-Patrick Düll

Herr apl. Prof. Dr. Wolf-Patrick Düll hält am

**Donnerstag, den 19. Juli 2018 um 16:00 Uhr,**  
im Sitzungssaal 8.122 der Fakultät Mathematik und Physik, Pfaffenwaldring 57,  
70569 Stuttgart Vaihingen

seine öffentliche Antrittsvorlesung zum Thema:

### **On the qualitative behavior of nonlinear dispersive systems**

Abstract: In many physical systems dispersion plays an important role, which means that waves of different wavelengths travel at different speeds. If the systems are nonlinear, it is possible that concentration effects balance dispersive effects such that structures of permanent form like traveling pulses can be observed.

In this talk, we explain how this phenomenon can be modeled with the help of partial differential equations. We present the two most famous nonlinear dispersive differential equations, namely the Korteweg-de Vries equation and the Nonlinear Schrödinger equation, and show that these equations can be formally derived as approximation equations to describe the dynamics of complicated nonlinear dispersive systems.

To understand to which extent these approximations yield correct predictions of the qualitative behavior of the original systems it is important to justify the validity of the approximations by estimates of the approximation errors in the physically relevant length and time scales. Therefore we discuss strategies for proving such error estimates, which is a highly nontrivial problem if the original systems are quasilinear.

Hierzu laden wir ein.

Prof. Dr. Christian Rohde (Dekan)