

Seminar Advanced Topics in Nonlinear Dynamics (Internal Seminar)

Thursday, February 15, 2018 at 14:15 p.m.
at the the Free University Berlin,
Arnimallee 7, rear building, seminar room 140.

Eiji Yanagida
(Tokyo Institute of Technology)

Dynamics of interfaces in the Fisher-KPP equation for slowly decaying initial data

The Fisher-KPP equation is a mathematical model of biological population growth process which is given by a nonlinear parabolic partial differential equation of the form

$$\varepsilon \frac{\partial}{\partial t} u = \varepsilon^2 \Delta u + u(1 - u)$$

with a small parameter $\varepsilon > 0$. In this talk, I will discuss the behavior of interfaces (or thin transition layers) when initial data decay slowly in space. In a singular limit as $\varepsilon \rightarrow 0$, the dynamics of interfaces can be reduced to a level set of a Hamilton-Jacobi equation

$$\frac{\partial}{\partial t} w = |\nabla w|^2 + 1.$$

Then by the method of characteristics, it is shown that various (but not all) motion of interfaces can be observed by taking initial data appropriately. This talk is based on a joint work with H. Ninomiya of Meiji University.

Guests are always welcome!