

情報科学研究科 重点プロジェクト

数学と諸分野の協働推進による  
学際的・総合的な新領域研究の開拓

M A T H E M A T I C S × E X T E N S I V E S C I E N C E

## 第13回講演会 兼 第60回応用数学連携フォーラム

日時

2017年3月28日(火) 16時30分～17時30分

会場

東北大学 情報科学研究科棟 大講義室

講演者

Riccardo Adami (Politecnico di Torino, Italy)

タイトル

The curious occurrence of negative energy ground states for a critical non-linear Schroedinger equation

概要

It is well known that the nonlinear Schroedinger equation models the lightwave propagation in optical fibers. The study of wave propagation in variously shaped devices, such as Y-junctions, H-junctions has gained its popularity in recent years. To understand the properties of the propagation, a key role is played by the behaviour of a special solution minimizing the energy, called ground state. For the so-called " $L^2$  critical" nonlinear Schroedinger equation considered on the Euclid space, ground states cannot have negative energy: indeed, for a ground state to exist it is necessary that the nonlinearity is focusing, and the computation of the moment of inertia due to Glassey shows that every state with negative energy blows up. We show that if the spatial domain is a quantum graph, then the compact core of the graph can trap negative energy ground states if some topological assumption is satisfied. This is a joint result with Enrico Serra e Paolo Tilli.



<http://www.math.is.tohoku.ac.jp/~project/>