Towards nonlinear hybrids: the planar NLS with point interactions.

Riccardo Adami

Politecnico di Torino

`adami.riccardo@gmail.com`

A natural, but not straightforward, generalization of networks is provided by hybrids, namely systems made by gluing together pieces of different dimension. The simplest hybrid is made of a plane connected to a halfline. Suitable matching conditions at the contact point are to be imposed in order to define a well-posed dynamics, and this procedure leads to studying propagation of waves in the presence of point interactions in the plane, subject to a possibly nonlinear dynamics. We discuss the case of the Nonlinear Schroedinger Equation, where the nonlinearity is either self-consistent, or external and concentrated at a point in the plane, morally the connection point of the plane and the halfline. This is a joint project with Filippo Boni, Raffaele Carlone, and Lorenzo Tentarelli.