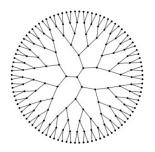ID de Contribution: **16**   Type: **Non spécifié**

Qualitative properties of solutions of NLS on metric graphs

jeudi 11 janvier 2024 16:35 (45 minutes)

In this talk, we will study qualitative properties of solutions to the Nonlinear Schrödinger Equation -u'' + au = |u|$^{p-2}$u on compact metric graphs.
Among the questions of interest are:

- if the graph possesses a symmetry, what about its positive solutions? What about action ground states? Can one identify and describe symmetry-breaking situations depending on parameters (lengths of edges, exponent p,...)?

- what can we say about nodal sets and nodal zones of sign-changing solutions? Can nontrivial solutions vanish identically on some edges? What about nodal ground states?

- when the parameter p gets close to 2, one expects the nonlinear problem to get close to a linear problem, leading to the spectral study of the graph. How to make this heuristic precise?

We will discuss those issues by presenting both general results and example studies.
In particular, we will provide a framework to rigorously study the behavior of the problem in the regime "p close to 2", which will be a powerful tool to understand qualitative properties of solutions.

The talk will end by presenting several open questions and research perspectives.

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