

Title: **Wave equations on bounded domains**

Aim: The aim of this short course is to introduce the students to the study of solutions to the semilinear wave equation on a bounded domain  $\Omega \subset \mathbb{R}^n$ ,

$$\partial_{tt}u - \Delta u + f(u) + k(x)g(\partial_t u) = h(t, x), \quad u(t, \cdot)|_{\partial\Omega} = 0$$

where  $f(u)$  represents a nonlinear restoring force,  $k(x)g(\partial_t u)$  a damping force and  $h(t, x)$  an exterior force. The classical approach to the well-posedness of solutions (existence, uniqueness and regularity) and their long-time behavior will be considered.

Based on the monograph [1] and references therein.

Duration: 6 hours divided into 3 lectures.

Bibliography:

[1] A. Haraux, Nonlinear vibrations and the wave equation. *SpringerBriefs in Mathematics*, BCAM SpringerBriefs, 2018