



THEMATIC PROGRAM IN MATHEMATICAL PHYSICS

*SPECTRAL THEORY, SEMI-CLASSICAL ANALYSIS,
AND CONDENSED MATTER PHYSICS*

Mini-Courses

November 2020 - March 2021

International Conference

Mathematics of Condensed Matter and Beyond (MCMB)

February 22-25, 2021

Monthly Seminars

Seminar by Dr. Ali Wehbe (Lebanese University)

Title: Control and spectral theory

Date and Time: December 17 at 3:00pm

Registration Link:

<https://aub.webex.com/aub/onstage/g.php?MTID=eea91be2840cb4533fe5ee9f5acc6491d>

Abstract:

The theory of control and stabilization of a physical system governed by mathematical equations, in particular by PDEs, can be described as the process of influencing the asymptotic behavior of the system to achieve a desired goal, primarily through the use of control that changes its end state. This theory is applied in a wide range of scientific disciplines and techniques such as noise reduction, structural vibration, waves and seismic earthquakes, regulation of biological systems, the design of robotic systems, etc. In this seminar, we will explain how we can study the stabilization of a physical system by using Reisz basis approach. This technique is based on finding first the asymptotic behavior of the eigenvalues and the eigenfunctions of the damped and undamped systems and then on proving that the system of eigenfunctions of the damped problem form a Reisz basis of the energy Hilbert Space.

Keywords:

Stability, control, Reisz basis, eigenvalues, eigenfunctions, asymptotic behavior.