

**THE CATHOLIC UNIVERSITY OF AMERICA
Washington, DC 20064**

**SEMINAR IN FUNCTIONAL ANALYSIS
AND RELATED AREAS**

Wednesday, October 4, 2023

4:45 p.m. - 6:30 p.m. (including a coffee break)

SPEAKER: Professor Alexander Levin
The Catholic University of America

TITLE: Generalized Gröbner Bases and Hilbert-type bivariate dimension polynomials of modules over polynomial rings

ABSTRACT: We will introduce a new type of Gröbner bases in free modules over polynomial rings over fields, prove some properties of such Gröbner bases and present a Buchberger-type algorithm for their computation. Using the obtained results, we will prove the existence and give a method of computation of a bivariate Hilbert-type dimension polynomial of a finitely generated module over a polynomial ring. We will show that the new dimension polynomial carries more module invariants than the classical Hilbert polynomial and apply this observation to the isomorphism problem for modules over polynomial rings.

The presentations will be given via Zoom. The corresponding link is as follows

<https://cua.zoom.us/j/87627066209?pwd=cWxxTlpIVko5YitkbVo2V0crMXk3QT09>

Meeting ID: 876 2706 6209

Passcode: 925357

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Web page: <https://mathematics.catholic.edu/faculty-and-research/mathematics-seminar/index.html>