

# ICUB Talks: Exact Sciences Section

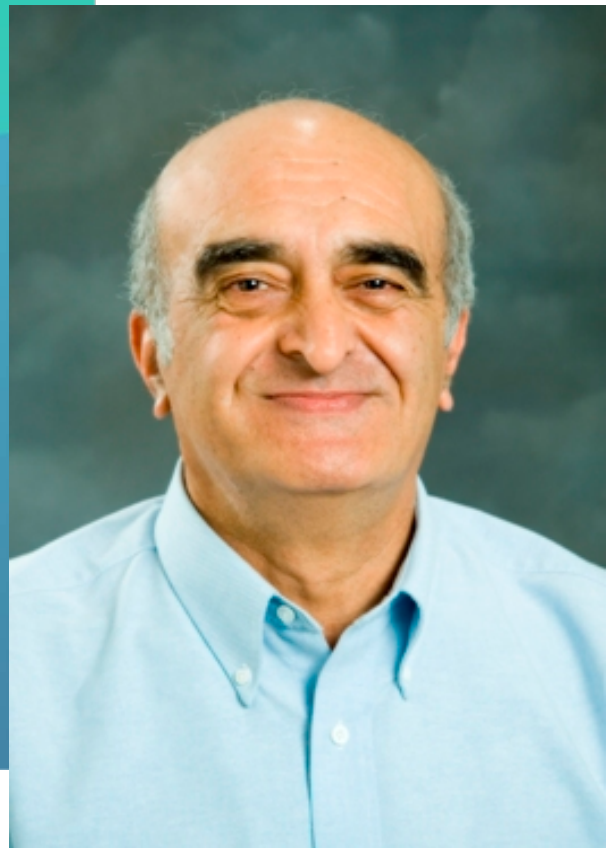
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## **HYBRID APPROXIMATIONS, AND LEGENDRE WAVELETS, FOR FRACTIONAL CALCULUS**

Fractional differential equations (FDEs) are generalizations of ordinary differential equations to an arbitrary (non-integer) order. FDEs have attracted increasing attention and interest due to their ability to model complex phenomena. Because of the extensive applications of FDEs in engineering and science, research in this area has grown significantly all around the world. Generally speaking, most of the FDEs do not have exact analytic solutions. Therefore, finding numerical solutions to these equations are very important.

In recent years, hybrid functions, and Legendre wavelets have found their way into many different fields of science and engineering. Many researchers started using hybrid functions and Legendre wavelets, for analyzing problems of greater computational complexity and proved to be powerful tools to explore a new direction in solving problems in science and engineering.

In this talk, first, an introduction to fractional calculus, hybrid functions, and Legendre wavelets are given. Then, an efficient numerical method based on hybrid functions, or Legendre wavelets, for solving the FDEs is presented. The numerical solutions are compared with available exact or approximate solutions to assess the accuracy of the proposed method.



Universitatea din București,  
Room 215 (second floor)

**Tuesday, June 4th 2019 at 16:30**

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