POLITECNICO DI TORINO

DISMA Dipartimento di Scienze Matematiche G. L. Lagrange

ECCELLENZA 2018 • 2022

CATTEDRA FUBINI

Prof. Alicia Dickenstein

Universidad de Buenos Aires
and Instituto de Investigaciones Matemáticas "Luis A. Santaló"

General Lecture

Algebra and geometry in the study of enzymatic cascades

October 1, 10:00-12:00- Aula Buzano - DISMA

In recent years, techniques from computational and real algebraic geometry have been successfully used to address mathematical challenges in systems biology. The algebraic theory of chemical reaction systems aims to understand their dynamic behavior by taking advantage of the inherent algebraic structure in the kinetic equations, and does not need the determination of the parameters a priori, which can be theoretically or practically impossible.

Prof. Dickenstein will give a gentle introduction to general results based on the network structure. In particular, she will describe a general framework for biological systems, called MESSI systems, that describe Modifications of type Enzyme-Substrate or Swap with Intermediates, and include many networks that model post-translational modifications of proteins inside the cell. She will also outline recent methods to address the important question of multistationarity, in particular in the study of enzymatic cascades, and will point out some of the mathematical challenges that arise from this application.

Seminars

Towards a multi-dimensional Descartes rule (but still far away)

October 3 - 10:00-12:00
Aula Buzano - DISMA

Iterated sparse discriminants and singular intersections of hypersurfaces

October 8 - 10:00-12:00
Aula Buzano - DISMA

Algebra and geometry in the study of enzymatic cascades, suite

October 10 - 10:00-12:00
Aula Buzano - DISMA

Alicia Dickenstein is an Argentine mathematician known for her work on algebraic geometry, particularly toric geometry, tropical geometry, and their applications to biological systems.
She is a full professor at the University of Buenos Aires, a 2019 Fellow of the American Mathematical Societ, a prior vice-president of the International Mathematical Union (2015–2018), and a 2015 recipient of The World Academy of Sciences prize.