Lagrangian systems with nonholonomic constraints

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May 18, 2022
14:00-15:00h on campus in M.G.005
Analysis & Geometry Seminar, Antwerpen

A rolling disk, a skate or a bicycle are all examples of mechanical systems with linear nonholonomic constraints. In this seminar talk, I will first derive their equations of motion in a Lagrangian framework. Next, I will interpret the constraints in terms of a non-integrable distribution and I will discuss a symplectic approach to these systems. Finally, I will introduce a nonholonomic Poisson-type bracket and I will explain its relation to the equations of motion and to the integrability of the nonholonomic distribution.