Leçons inaugurales IRMP

Mardi
29 Janvier
2019

Bâtiment
Marc de Hemptinne
Auditoire Charles
de la Vallée Poussin,
CYCL 01

15h Prof. Céline Degrande
Tracking down new physics

16h Prof. Heiner Olbermann
Paper crumpling

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Tracking down new physics

Abstract:

The Standard Model (SM) of elementary particles has numerous successes. Its latest famous success is the discovery of the Brout-Englert-Higgs boson. However, the SM has also some issues. For example, the SM particles are only responsible for about 5% of the Universe content. The remaining 95% are unknown and labelled dark matter and dark energy.

Many extensions of the SM have been build to tackle one or several of those issues but no physics beyond the SM has been observed so far despite the numerous dedicated searches. My research aims at finding new ways to search for new physics by proposing new measurements for existing and future experiments. In this talk, I will present new observables sensitive to new physics at colliders and in astrophysics.

Vita:

Céline Degrande has come back to UCLouvain in October 2018 as a new academic in CP3. She obtained her PhD at UCLouvain in 2011 and then worked as a postdoctoral researcher at the University of Illinois at Urbana-Champaign, at Durham University and at CERN. Her main research interested is to find evidence of physics beyond the Standard Model both at collider and in astrophysics.

Paper crumpling

Abstract:

When crumpling a thin elastic sheet (think a piece of paper), one observes the emergence of an intricate pattern of regions where the deformation energy focuses. The rigorous analysis of these patterns turns out to be a very difficult and interesting problem, linking nonlinear elasticity, the calculus of variations and differential geometry. A large part of my scientific work can be linked in some way or other to this setting. In this talk, I will present the current state of the art, including some of my own results.

Vita:

H.O. has joined UCLouvain in the fall of 2018 as a new academic at the IRMP. A trained physicist, he obtained his PhD in mathematical physics from Cardiff University. Thereafter he turned his professional interest to mathematical analysis, working as a postdoc at Bonn University and later as non-tenured faculty at Leipzig University. His research is rooted in the calculus of variations, with a focus on questions that link up with materials science and differential geometry.