



## LMS/LadHyX Seminar

5 January 2022 at 10:45 am - Room Jean Mandel

### Instabilities in kirigami structures

Marcelo Dias

University of Edinburgh

#### ABSTRACT

Kirigami, an ancient Japanese art of paper cutting, inspires new ways to tailor the morphology and the mechanics of thin elastic sheets. It has been found to be of special relevance to applications in reconfigurable structures (e.g., large deployable structures) and microstructures (e.g., stretchable electronics). Indeed, careful tailoring of cut patterns results in structures with interesting non-linear macroscopic responses emerging from local instabilities. In this presentation, we will discuss local effects in Kirigami by focusing our attention on the study of the deformation of a thin sheet with a single cut—i.e., the most basic and fundamental geometric building block of Kirigami. We will also discuss a new phenomenon that arises when kirigami sheets interact with a liquid substrate, namely elastocapillary kirigami. We study the effects of a liquid foundation and how it changes the nature of the local instabilities. Our analysis reveals that post-buckling configurations displays two types of a phase transitions: continuous (second order phase transition), which suggests a uniform phase; and a discontinuous transition (first order), leading to a phase propagation through kirigami structures.