

Seminar/Talk

Deploying kirigami: from a trash bin to a luxury bag

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Kirigami technique, based on cutting alternating overlapping slits in a closed-loop pattern, enables the deployment of a three-dimensional structure from a single flat sheet when a perpendicular load is applied. This load may be a point load, applied through a thread attached to the center, or a distributed load, such as the structure's own weight or a transverse flow.At the local scale, the cuts create an assembly of ribbons that behave like springs arranged in parallel and in series. By understanding the local deflection of a ribbon, we propose a method for designing cutting patterns that achieve a desired target shape under various deployment conditions. In this presentation, we focus on kirigami under flow where the overall shape is controlled by a water pump in a closed channel. As the structure deploys, openings are formed within the sheet, allowing the flow to pass more easily and thereby reducing the applied force. This coupling between shape and flow can lead either to a stable equilibrium configuration or, in some cases, to dynamic oscillations. For the latter, we try to understand the phenomenon by decoupling the flow's impact and the structures resonance frequency.

Thursday, December 10, 2026 11:00am - 12:00pm
Moonstone Kitchen, 1st Floor

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