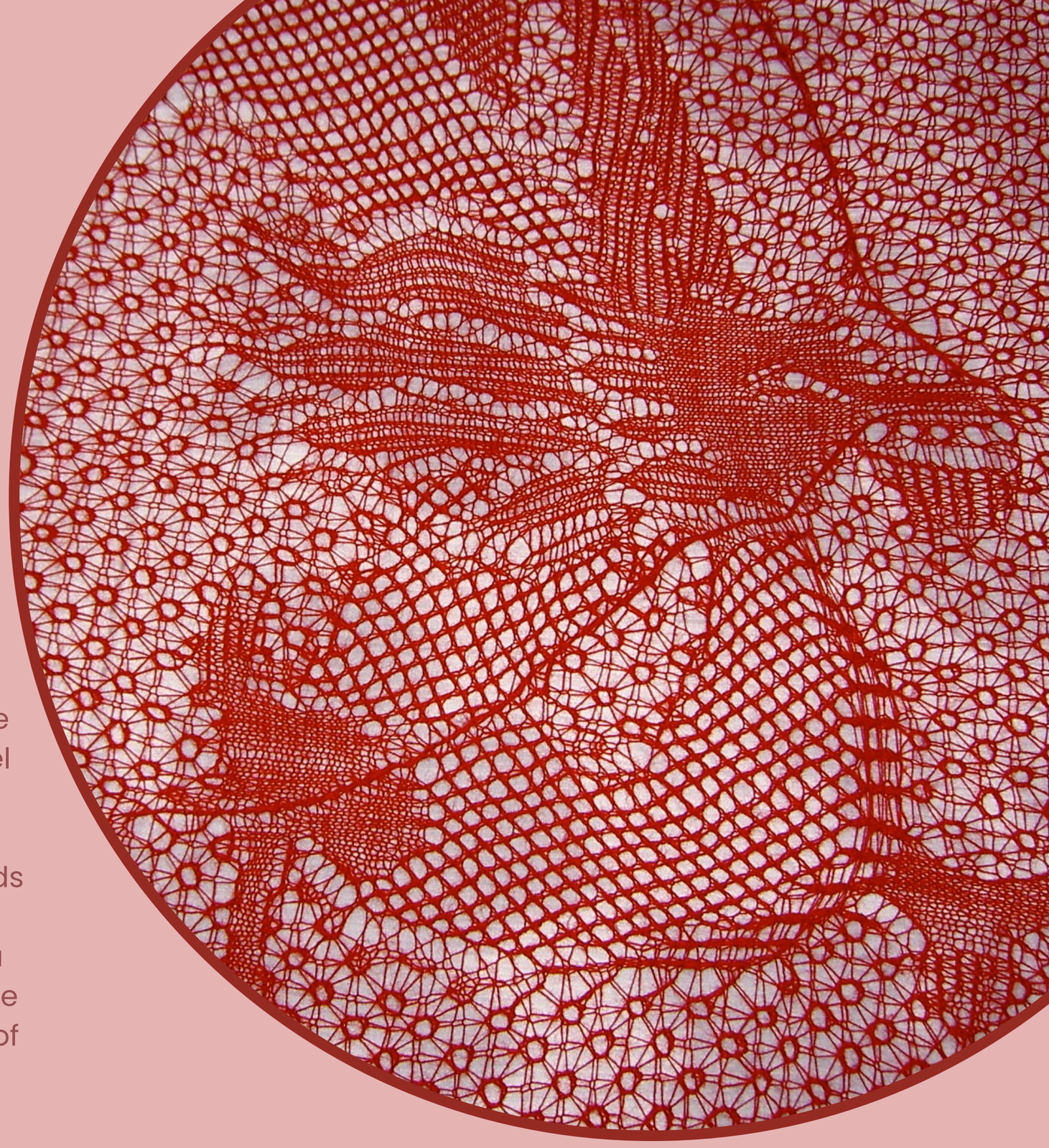
TWISTED TOPOLOGICAL TANGLES OR: THE KNOT THEORY OF KNITTING



ABSTRACT

Imagine a 1D curve, use it to fill a 2D manifold that covers an arbitrary 3D object – this computationally intensive materials challenge has been realized in the ancient technology known as knitting. At a basic level there is only one manipulation that creates a knitted stitch – pulling a loop of yarn through another loop. However, there exist hundreds of books with thousands of patterns of stitches with seemingly unbounded complexity, and the topology of knitted stitches has a profound impact on the geometry and elasticity of the resulting fabric. We have developed a formalization of the topology of two-periodic weft knitted textiles, proving that such knits form ribbon links. This puts a new spin on additive manufacturing – not only can stitch pattern control the local and global geometry of a textile, but the creation process encodes mechanical properties within the material itself.

FRIDAY, AUGUST 11

US PACIFIC.....9AM
US EASTERN.....12PM
CENTRAL EUROPE.....6PM

ELISABETTA MATSUMOTO
Georgia Tech

Featuring "Show and Ask" Presenters

Catherine Hsu
Swarthmore College

Lucía Rossi
University of Leoben

The talk will be on Zoom. Scan this QR code to join!

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