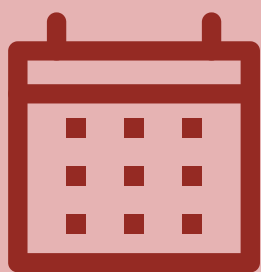
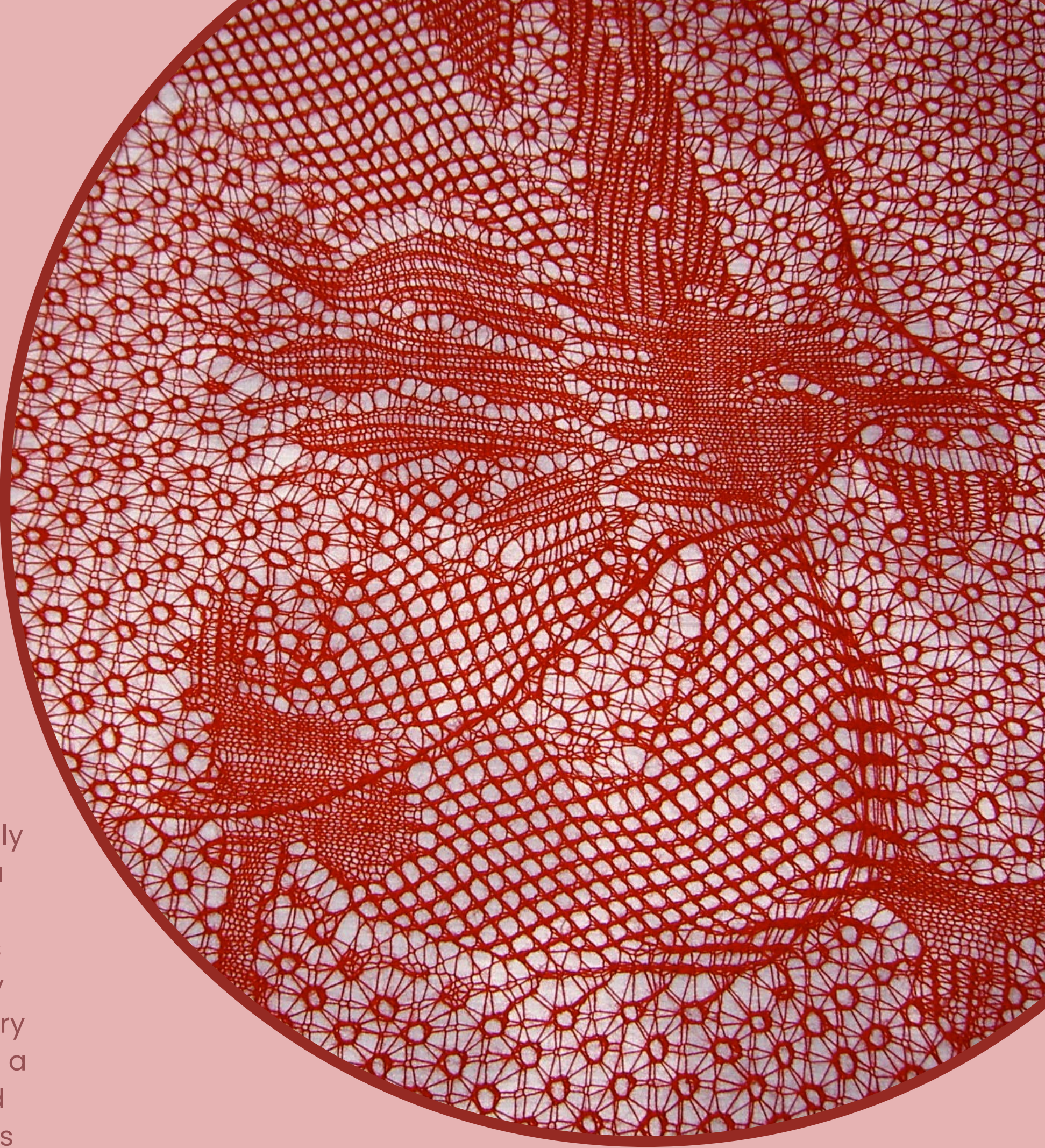


TWISTED TOPOLOGICAL TANGLES OR: THE KNOT THEORY OF KNITTING ABSTRACTIONS

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
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Swarthmore College

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