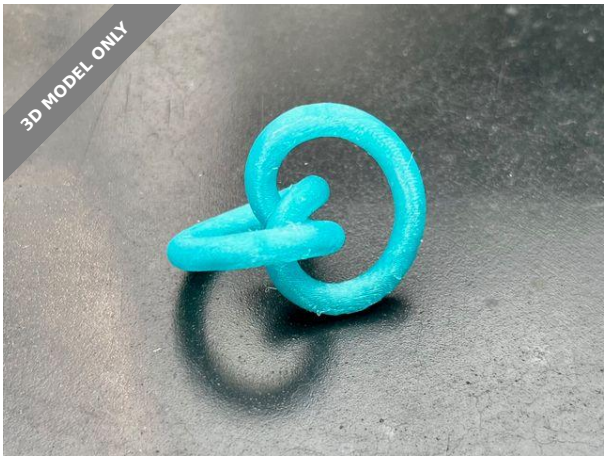
Printables by JOSEF PRUSA



Optimized Rolling Knot

mathgrrl

VIEW IN BROWSER

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Summary

A small trefoil knot that has been optimized for rolling

Learning > Math

Tags: knot desktoy action geek fun math roll nerd easyprint

See this model rolling in action here:

Tritangentless knots have a curious and beautiful property: when realized as physical 3D printed models, they roll. Some tritangentless parameterizations roll more easily and freely than others. In the paper below we numerically optimize parameters to obtain the most “aesthetically pleasing” rolling knots and then create physical models of these knots using 3D printing, thereby leveraging mathematical tools to obtain an elegant kinetic sculpture.

Optimizing Morton's Tritangentless Knots for Rolling
Abigail Eget, Stephen K. Lucas, and Laura Taalman
Proceedings of Bridges 2020: Mathematics, Art, Music, Architecture, Education, Culture
https://archive.bridgesmathart.org/2020/bridges2020-367.html

If you don't have a 3D printer then you can order rolling knots at this link:
https://www.shapeways.com/shops/mathgrrl?section=Rolling+Knot+Collection

Model files

mathgrrl_rolling_knot.stl

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