# Berlin Mathematical School

# BMS Friday Colloquium

## Friday 26 April 2019 at 14:15
*Tea & Cookies starting at 13:00*

BMS Loft, Urania, An der Urania 17, 10787 Berlin
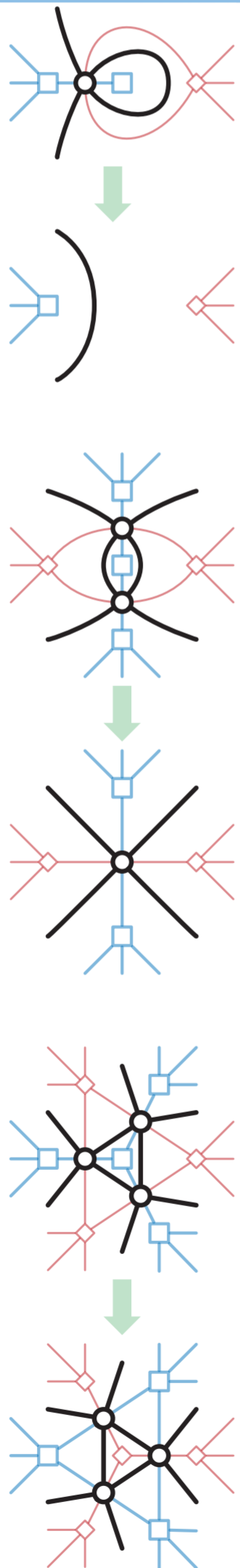
## Jeff Erickson
*(U Illinois)*

### Variations on a theme of Steinitz

In 1916, Ernst Steinitz proved a seminal theorem describing the graphs of 3-dimensional convex polyhedra. In this talk, Erickson will describe two classical proofs of this theorem and recent research that these proofs have inspired. Steinitz himself gave a combinatorial proof using delta-wye transformations and medial graphs; Erickson will describe some recent results on efficiently similifying curves on surfaces via homotopy moves inspired by Steinitz's argument. A second proof can be assembled from Maxwell's 1864 study of reciprocal diagrams and Tutte's 1963 "spring" embedding theorem; Erickson will describe a natural extension of this proof to graphs on the flat torus.

This talk includes joint work with Hsien-Chih Chang, Patrick Lin, and several others.

Jeff Erickson is a professor of computer science at the University of Illinois at Urbana-Champaign, USA. He took up his first position at the computer science department in 1998, and from 2013 to 2016 he was associate department head and chair of the faculty recruiting committee. His main research interests are computational geometry, computational topology, and graph algorithms. Erickson gained his PhD from U California, Berkeley in 1996, and various visiting positions have taken him to Germany, France, Austria and the Netherlands. His awards include a National Science Foundation Career Award (2001-2006) and a Sloan Research Fellowship (1999-2002).

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