Abstract:

In ancient Greece, Euclid described a system of geometry in The Elements. There are deep connections between this geometry and questions in algebra, as explained by the 19th century French mathematician and political activist Evariste Galois. These connections will allow us to settle the classical questions of Euclidean geometry. Next we will explore the ancient Japanese art of origami, and discover how paper folding can be turned into a framework for studying geometry. This paper-folding alternative can do everything Euclid could do, and more! Indeed, this seemingly abstract mathematical theory can have surprising and useful applications.