

Higher dimensional origami constructions

Adriana Salerno
National Science Foundation,
Alexandria, VA – 22314

Abstract

Origami is an ancient art that continues to yield both artistic and scientific insights to this day. In 2012, Buhler, Butler, de Launey, and Graham extended these ideas even further by developing a mathematical construction inspired by origami – one in which we iteratively construct points on the complex plane (the “paper”) from a set of starting points (or “seed points”) and lines through those points with prescribed angles (or the allowable “folds” on our paper). Any two lines with these prescribed angles through the seed points that intersect generate a new point, and by iterating this process for each pair of points formed, we generate a subset of the complex plane. We extend previously known results about the algebraic and geometric structure of these sets to higher dimensions. In the case when the set obtained is a lattice, we explore the relationship between the set of angles and the generators of the lattice and determine how introducing a new angle alters the lattice. (Joint work with Deveena Banerjee and Sara Chari.)

Keywords: Points, lines, angles, geometric construction, lattice.