Unfolding Mathematics at Burning Man

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PDL C-401

We constructed a 2-ton metal, wood, and acrylic interactive sculpture that came to life at Burning Man 2018, with an estimated 6500 person hours invested and over $40,000 in funds raised. Rising 12 feet tall with an 18-foot wingspan, the unfolding dodecahedron was externally skinned with 2240 acrylic windows, illuminated by 16,000 LEDs. The interior, large enough to hold 15 people, was fully lined with a massive mirror over each of the twelve pentagonal faces, alluding to a possible shape of our universe.

The heart of this artwork can be traced back 500 years to Albrecht Durer, and the open problem of trying to find one possible unfolding for convex polyhedra. We develop a visual algorithm and show that *every* unfolding of an n-cube is valid, with elegant relationships to integer partitions and chord diagrams.

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