

Express Riddler

13 September 2019

Riddle:

At long last, Dakota Jones is close to finding the Lost Arc, a geometric antiquity buried deep in the sands of Egypt. Along the way, she discovered what she described as a “highly symmetric crystal” that’s needed to precisely locate the Arc. Dakota measured the crystal using her laser scanner and relayed the results to you. But nefarious agents have gotten wind of her plans, and Dakota and the crystal are nowhere to be found.

Locating the Arc is now up to you. To do that, you must recreate the crystal using the data from Dakota’s laser scanner. The scanner takes a 3D object, and records 2D cross-sectional slices along the third dimension. Here’s the looping animation file the scanner produced for the crystal: [Link](#)

What sort of three-dimensional shape is the crystal? No pressure—Dakota Jones, nay, the entire world, is counting on you to locate the Lost Arc and ensure its place in a museum!

Solution:

The shape is a cube. The cross-sectional planes are normal to a diagonal which connects any two opposite vertices of the cube. The shape is not unique, though, and the cube could be stretched or compressed along that diagonal. But the riddle hints that it is highly symmetric, and a cube itself is more symmetric than the stretched or compressed shapes.