On Friday at 1pm, in CH 7
Michelle Manes will be presenting

**Integer and Rational Points**

Since the time of the ancient Greeks, mathematicians have asked questions about integer and rational solutions to polynomial equations. The line $3x + 6y$ doesn't have any integer points on it at all. However, it's easy to check that the point (-3, 8) is an integer point on the line $29x + 11y = 1$. And it turns out that once you have one integer point on a line, you'll have infinitely many of them.

Asking these questions about curves can be much more complicated. The circle $x^2 + y^2 = 1$ has finitely many integer points, but infinitely many points with rational coordinates. (These rational points are closely related to Pythagorean Triples like 3-4 5 and 5-12-13.) However, the circle $x^2+y^2 = 3$ has no integer or rational points at all, and we can prove it.

These questions very quickly move into areas of current research in mathematics, including questions which are still unknown, like this one: "Can you find a rectangular box so that all of the side lengths, the diagonals of each face, and the long internal diagonals are all integers?"