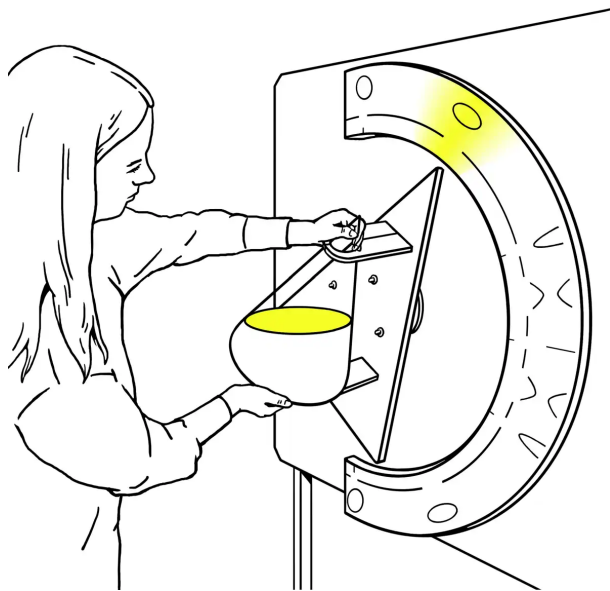# Conic sections

What shapes do the surface edges of the liquid have when you rotate the cone?

Turn the cone filled with the blue liquid.

Watch the surface edges of the blue liquid. Depending on the position of the cone, different mathematical curves form.

One can observe four important curves: circles, ellipses, parabolas, and hyperbolas.

Circle: In the vertical position of the cone, with the tip pointing up or down, the outer edge of the liquid is closed and circular.

Ellipse: If you keep turning the cone, you can see an elliptical edge. The size of the cone determines whether the ellipses are closed.

Parabola: Upon further rotation, the liquid surface is parallel to the cone surface at a certain point. In this case, the outer edge has a parabolic shape.

Hyperbola: If you turn the cone even further, the edge takes on the shape of a hyperbolic curve. This is an open curve that consists of two symmetrical parts. If you held an identical cone with the tip facing the tip of the cone in the exhibit, you would see the same shape of the liquid edge there.

The curves you see are significant in mathematics. They often occur in nature and also have a practical use. For example, planetary orbits have an elliptical shape.

The parabola is used in satellite dishes, and a parabolic mirror was used in ancient times to light the Olympic flame with the help of the sun.

Hyperbolic functions are often used to calculate the courses of chemical reactions in advance. Similar shapes can be observed on the outside of the phaeno building. The cones, on which the building stands, are cut, resulting in parabolic shaped windows.