

Kundt's tube:

[3D30.60 - Kundt's Tube | Instructional Resources and Lecture Demonstrations](#)

[Kundt's tube vid 1](#)

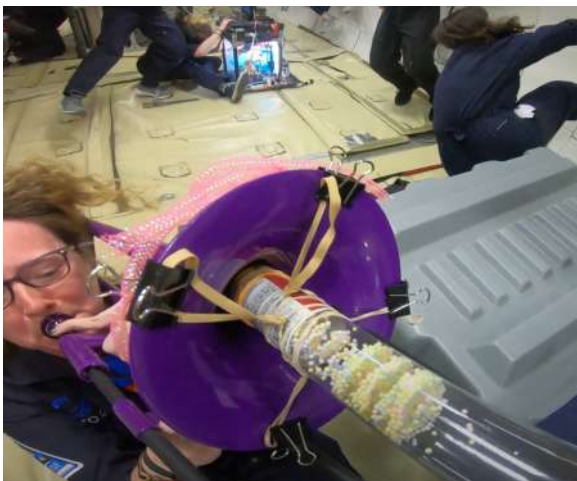
[Kundt's tube vid 2](#)

<https://uicapture.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=d879b1cf-cfe0-453d-965b-af1701034008&start=14.034522> vid 3

Kundt's tube is an experimental acoustical apparatus invented by German Physicist August Kundt in 1866. It is an effective way to visualize standing waves in a gas as well as demonstrating acoustical forces.

The Kundt's tube consists of a transparent horizontal pipe containing a small amount of a fine powder. A sound generator such as a loudspeaker sits at one end of the tube, while the other end is blocked by a movable piston used to vary the tube length.

The piston can be adjusted until the sound from the tube suddenly increases in volume, indicating that the tube is at resonance. This means the length of the total path of the sound wave (from one end of the tube to the other then back) is a multiple of the wavelength of the sound waves.



At this point, the sound waves in the tube are in a form of standing waves, forming equidistant nodes, locations at which the amplitude of vibrations of air is zero. The powder moves with the air and settles in piles at the nodes where the air is still. Measuring the distance between the piles of powder gives the length of one half the wavelength of sound ($\lambda/2$).

Using the known frequency (f) of the sound and the measured length of the wavelength of the sound waves (λ), the speed of sound (c) can be derived with the equation $c = \lambda f$.