Set expectations!!
○ What grade are you aiming for?
○ What do you want to learn in the course?
○ What do you enjoy in physics or astronomy?
○ What would you like to do in the current Project?
○ Where would you like to get support from team members?
○ When are you available; preferred working hours

Atom	Sam	Camiel	Jasper
10	8+	8+	8+
hoe een akoestische camera werkt	samenwerken	Leren werken in een onderzoeksgroep	Hoe werkt het werken in een onderzoeksgroep. Github.
Het praktische	Het feit dat je theorie in de praktijk kan toepassen.	Het theoretische & wiskundige	Het theoretische gedeelte van deeltjesfysica.
Ik kan programmeren.	Programmeren en animeren.	Programmeren is leuk, wil wegblijven van poster/filmpje voor zover mogelijk	Metingen doen in de praktijk, poster maken. Plannen en organiseren.
de animatie	De poster	Poster/filmpje	Het programmeren.

Ma	Di	Wo	Do	Vr	Za	Zo
				Poster Feedback		
Animatie Feedback	25-06, Poster deadline 9.00AM					

Please make sure you cover the following
○ Clara & Joshua available 11-12h
○ Set expectations: ambitions, availability, competences
○ Determine platform(s): Overleaf, **Github**, Onenote, GDrive, ...

○ Determine meeting frequency/schedule/location
○ Make minutes of your meeting!

Proberen 4 dagen in de week aanwezig te zijn van minimaal 9 tot 13.
Aan het begin van elke dag een kort overleg inplannen om progressie en vragen te bespreken. Met deze sessie willen we proberen de dag zo duidelijk en gestructureerd mogelijk te werk te kunnen gaan.

150 woorden maximum (poster)

Freely vibrating rods will have antinodes at both endpoints. This can be derived in as follows: scalar fields $\Psi(u, t)$ that describe vibrations must obey wave equation

$$\frac{\partial^2}{\partial^2 t}\Psi(u, t) = c^2 \nabla^2\Psi(u, t) ,$$

where c is the wave speed [1]. When describing the vibrations of a free rod, the boundary condition $\frac{\partial\Psi}{\partial x}|_{x = 0, L} = 0$ is typically assumed, indicating that there is no net force at the ends of the rod [2]. Combining the general solution for the wave equation with the boundary condition, it can be shown that $\Psi(u, t)$ describes a wave with anti-nodes at the ends of the rod. The same argument can be extended to explain this phenomenon in a free triangle.

[1] https://en.wikipedia.org/wiki/Wave_equation
[2] https://galileo.phys.virginia.edu/classes/152.mf1i.spring02/Boundary%20Conditions.htm#:~:text=The%20free%20end%20boundary%20condition%20for%20a%20string%20is%2C%20then%2C%20that%20its%20slope%20goes%20to%20zero%20at%20the%20boundary.

Uitleg filmpje

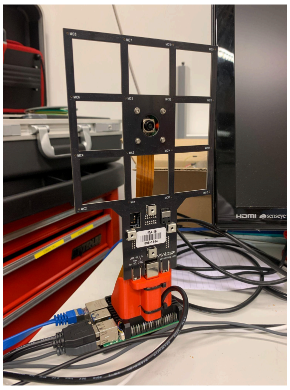
show picture of mr Chladni on board
show drawings of rod vibrating at the endpoints
*show assumption 1: “1. Obey wave equation: $\frac{\partial^2}{\partial^2 t}\Psi(u, t) = c^2 \nabla^2\Psi(u, t)$”.
demonstrate what it means for one piece of rod to accelerate the same as the piece of rod next to it
point to the outer side of the rod when saying that there’s no force acting from outside
point to the part of rod next to the side when saying that the force comes from the rest of the rod
show the pieces of rod “accelerating differently”
Mathematically, this is the same as saying THIS: $\frac{\partial\Psi}{\partial x}|_{x = 0, L} = 0$
show sines and cosines with an arrow pointing to two maxima (ideally let those be the endpoints of the graph

About 200 years ago, my colleague, mr. Chladni discovered that free vibrating rods mostly move at the endpoints, like so. This result can be derived quite easily if we make some assumptions. First, we must assume that our wave function obeys the wave equation. Next, we assume that one infinitesimally small piece of the rod accelerates at the same rate as the piece of rod next to it. After all, if this weren't true, our rod would fall apart! Let’s take a closer look at what this means. Because we are talking about a free rod, there is no force acting on either endpoint of the rod. Thus, the net force that’s acting on the end of the rod only comes from the rod itself. But wait. If we allow the net force at an endpoint to be non-zero, that would mean that the piece of rod attached to it is applying this net force, and as a consequence, the two pieces of rod would accelerate differently. We assumed that this can’t be true at any point in the rod, so we can conclude that the endpoint of the rod mustn't undergo any force from the rest of the rod. Because the force in the rod is related to the amount of bend in the rod, this is equivalent to saying that the rod mustn't be bent at either endpoint. Mathematically, this is the same as saying THIS. Now, if we combine the general solution of the wave equation, which is a linear combination of a bunch of sines and co-sines, with our newfound boundary condition, we'll find that our wavefunction must take maxima at the endpoints of the rod! But what happens if we transform the rod into a TRIANGLE? Will it still vibrate like this, or will it start doing something else? Well, using exactly the same arguments as before, the triangle SHOULD still be vibrating mostly at the endpoints. THIS is what group 24 has tried to verify experimentally, using an acoustic camera array. So, do you think the group found the result they expected? Did they discover new physics? Did they manage to find anything at all? I don't know the answer to any of these questions, but I do know for a fact that the group is happy to tell you all about how their project turned out on the 27th of June, so go pay them a visit!

Nieuwe theorie voor poster:

An acoustic camera consists of a n x m array of microphones, with a camera in the center (fig. 1).

fig 1



subsc: The AC we used: a miniDSP UMA-16 v2 microphone array and a Raspberry Pi Camera Module 3 Wide camera operated by a Raspberry Pi 5 computer.