

## Copy

title: - Struggles in Science (Practice Talk) author: - Mae Andersen  
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refs.bib

# What is an Optical Resonator?

An optical resonator is characterized by its **resonant modes**.

# Jargon: Resonant Modes

- ▶ resonant: Something that continues to ring or “sing”



mode: Any distinct pattern or vibration in a physical system

Revisit: What is an Optical Resonator?

An optical resonator is an object that when interacting with light, will continue ring or “sing” with light. You will notice that this “singing” only occurs for distinct patterns or vibrations of light.

—— # Idea #1 of Optical Resonators > Has resonant modes which get excited due to incoming light.

# Illustration of an accoustic resonant mode

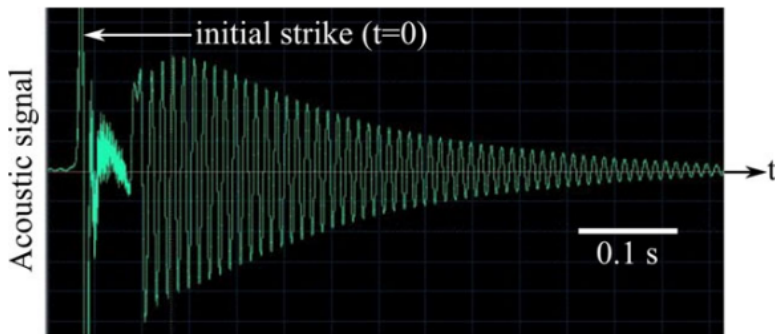


Figure 1: helmhotz resonator

*The accoustic resonator is knocked by the palm of a hand ( $t = 0$ ).*

*refs:[@Lalanne2018]*

# Illustration of an acoustic resonant mode

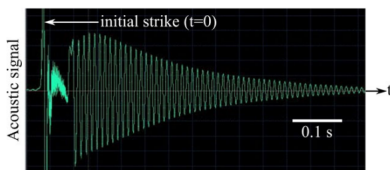


Figure 2: helmhotz resonator

*The acoustic resonator is knocked by the palm of a hand ( $t = 0$ ).*

- ▶ initially, the acoustic signal is very complex
- ▶ for  $t > 0.1$ , the acoustic signal:
  - ▶ oscillates at the resonant frequency
  - ▶ gradually decays in time

*refs: [Lalanne2018]*

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# Question: Resonant modes have distinct patterns or frequencies, but do

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## Idea #2 of Optical Resonators

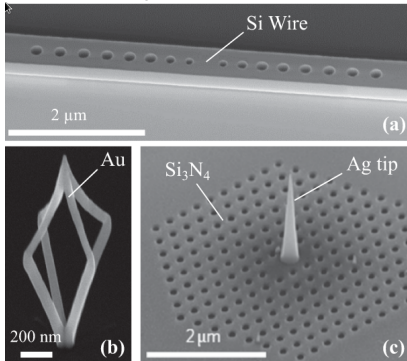
*A resonant mode's energy decays after it gets excited (some decay really fast while others take a while).*

## Idea #3 of Optical Resonators

*Looking at the resonator signal after “long enough” is a way to look at the resonant mode's signal!*

# Resonators Come in All Shapes, Sizes, and Materials

- ▶ Optical resonators are actually very diverse!
  - ▶ (a) just patterns of holes
  - ▶ (b) it looks like a cage?
  - ▶ (c) it is a tip in the middle of holes



*refs: [ @Lalanne2018 ]*

# Make good experiences in stem!!!



My entire social life changed, and that was hard

When I came out, my social identity changed non-adiabatically. I had to build a new social life as a new person. It was one of the hardest things I've ever done.

I accumulated a lot of stress from wearing dresses and makeup out in public

At age 24, I felt really really **\*\*really\*** awkward trying to be myself