

PHL101: Physics for Engineers

- Modern Physics
- Materials' property

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- Optics
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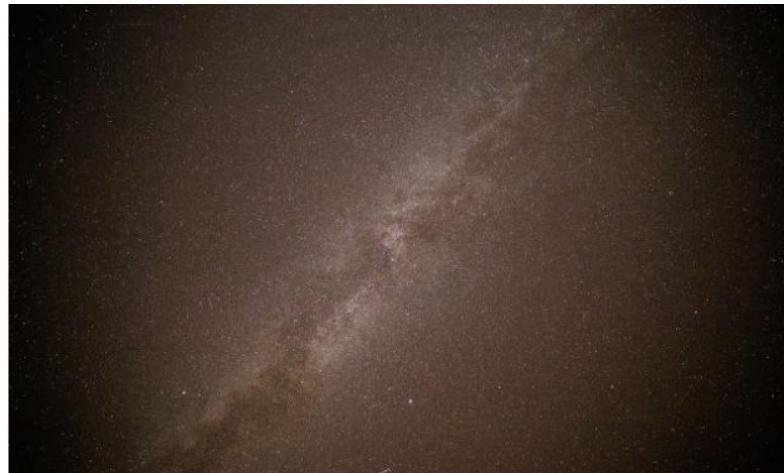


- Nature Lover
- Yoga enthusiastic
- Enjoy Sports, Cooking and Photography

<https://sites.google.com/view/achaudhary/home>

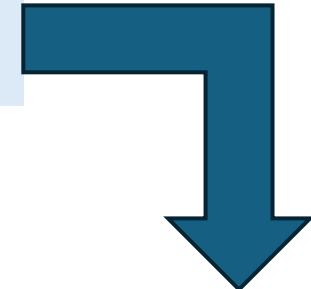
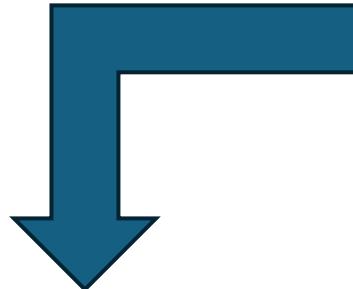
28-07-2025

PHL101_Dr. Anjali Chaudhary



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- Mid Sem exam

Evaluation

- Surprise test

- **Physics** is the fundamental science that studies matter, energy, and the interactions between them, encompassing everything from the smallest particles to the vast universe.
- **Modern Physics:** Explores the behaviour of matter and energy at the atomic and subatomic levels, including quantum mechanics and relativity.

Materials' property



Wood

Insulator

Dull appearance



Metal

Conductor

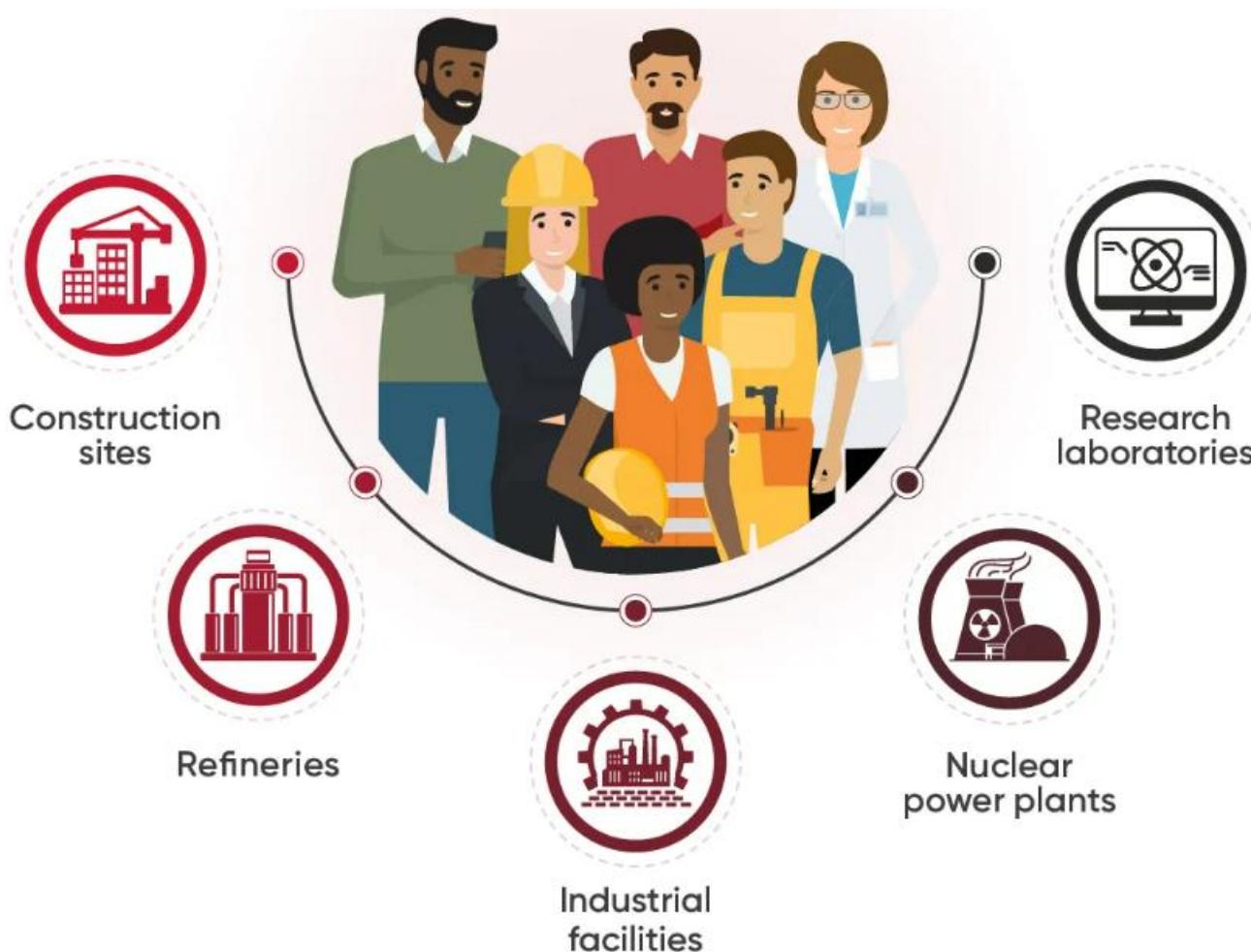
Shiny appearance

Based on a certain **property**, you can **distinguish a material**.

1. Electrical Conductivity
2. Appearance

Materials' property: Why important for engineers?

WHAT ENGINEERS DO?



Materials' property: Why important for engineers?

1. Pick Application → Determine required Properties

Properties: mechanical, electrical, thermal, magnetic, optical.

2. Properties → Identify candidate Material(s)

Material: structure, composition.

3. Material → Identify required Processing

Processing: change *structure* and overall *shape*
ex: casting, sintering, vapor deposition, doping
forming, joining, annealing.

Basic Understanding on Materials' properties is important

Materials' property: Example from my lab

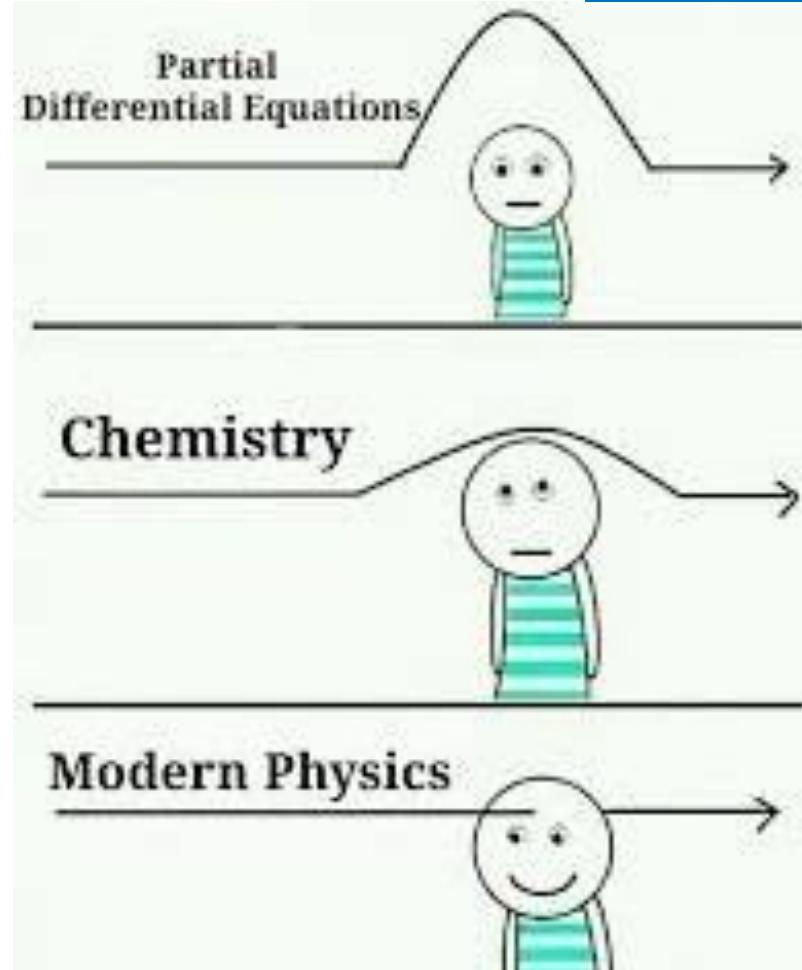
1. Pick Application → Determine required Properties
Photodetector electrical and optical
2. Properties → Identify candidate Material(s)
Material: Semiconductor
1. Electrical Conductivity between metals and insulators
You can tune the conductivity of semiconductor
2. Optical
3. Material → Identify required Processing
Processing: change *structure* and overall *shape*
ex: lithography and etching

Modern Physics

Gen Z...I think is modern...

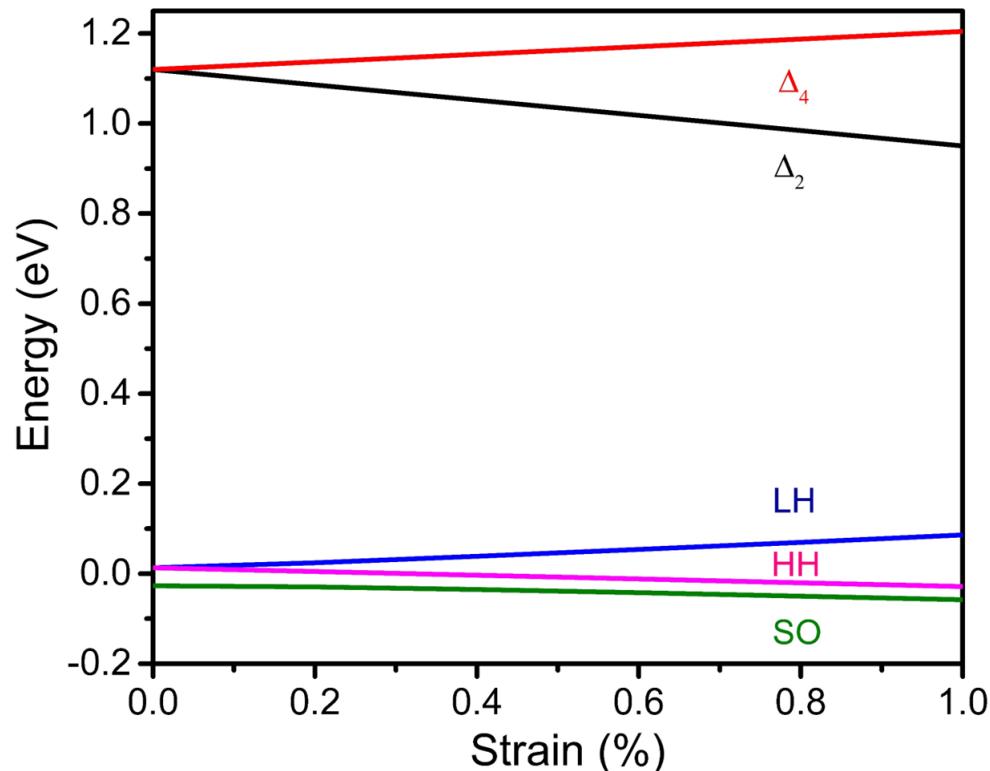
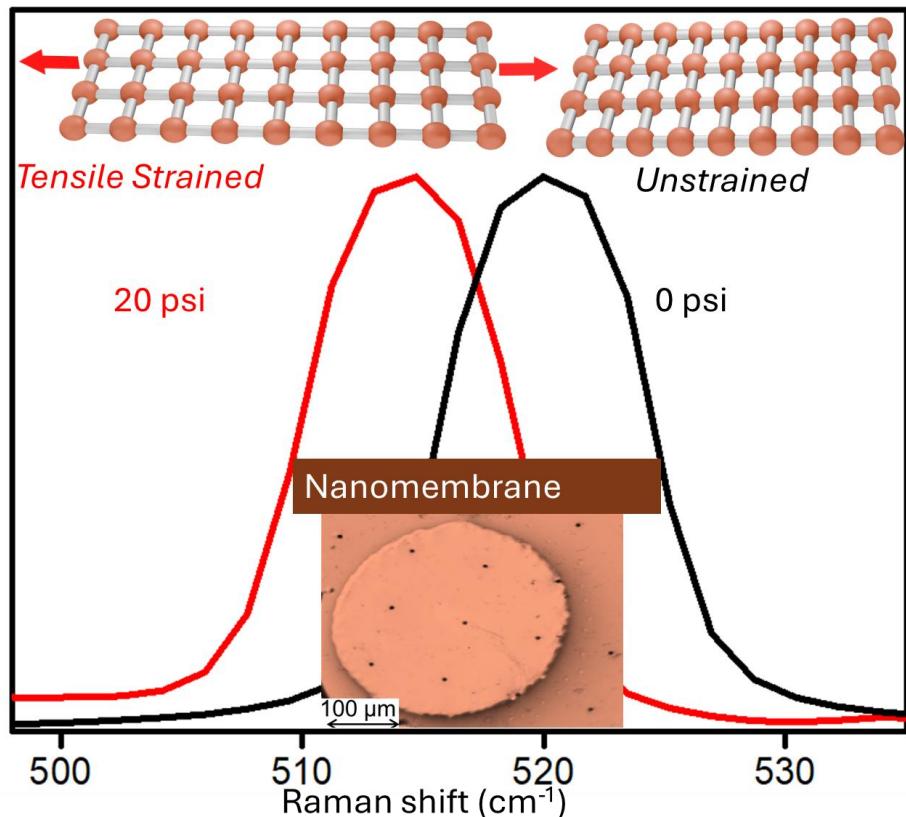
so you must also be aware of

MODERN PHYSICS



Modern Physics: Example from my lab

- Tuning the atomic structure of Si using strain



Experiment tells --> Si is strained

Theoretical calculations -->
atomic structure of Si changes

Ref : <https://pubs.acs.org/doi/full/10.1021/acsanm.5c00242>

When you start a class and
your new Instructor says,
“We’re here to study ”



And your reaction right now



PHL101: Physics for Engineers

Google classroom

xzhkp3m

Class will start at 10:35 am,
no one is allowed to enter after that