

We meet to share ideas and support each other in the teaching of Physics

Theme **Biophysics**

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IOP Physics Coach

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IOP Physics Coach

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Assistant Professor (Physics) at DCU

programme

Chair of Physics with Biomedical Sciences degree

IOP *Rosse medal* winner in 2014 for her research

Hub resources on Padlet

IOP Physics Hub padlet
Resource area

Hub 91 to 98	Hubs 81 to 90	Hubs 71 to 80	Hubs 61 to 70
Hub-98_Ireland's Physics Heritage Hub-98 Notes and Resources Hub-98 Presentation Eoin Gill's talk on Robert Boyle	Hub-81_Electricity Hub-81 Notes and Resources Hub-81 Presentation Rory - Electric Potential Rory - Current and Voltage	Hub-71_Dyscalculia Notes and Resources Hub-71 Presentation Anne O'Shea - Dyscalculia	Hub 61_Success & Success Notes and Resources Success - Richard Moynihan Structure strips - R Moynihan Solar Eclipse 1 - R Geoghegan Solar Eclipse 2 - R Geoghegan
Hub-97_Make-it-yourself Physics Hub-97 Notes and Resources Hub-97 Presentation	Hub-82_Brecon-2023 Hub-82 Notes and Resource Hub-82 Chatlog Physics World Rory using Archimedes for Density	Hub-72_X-rays Notes and Resources Hub-72 Presentation	Hub 62__Science Week 2022 Notes and Resources Hub-62 Presentation Science--Tullamore - Noreen Flynn Paper Poppers - Mary Gorey Sample Science Week Programme
Hub-96_Circuits Hub-96 Notes and Resources Hub-96 Presentation	Hub-83_Oscillations Hub-83 Notes and Resources Rory presentation: Waves & radio Hub-83 presentation	Hub-73_Inclusive Physics Notes and Resources Hub-73 Presentation Will Stark vision impaired physics	Hub-63_Physics Help Notes and Resources Hub-63 Presentation
Hub-95_Engineering Hub-95 Notes and Resources	Hub-84_Popular Physics Hub-84 Notes and Resources	Hub-74_Force Notes and Resource Hub-74 Presentation	

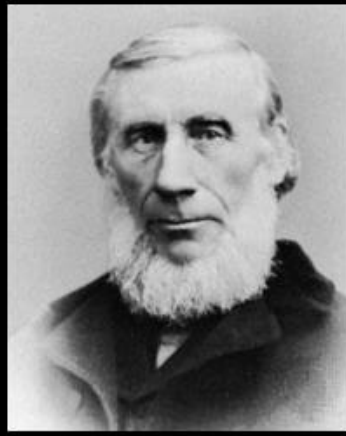
Eoin Gill
was our guest



Robert Boyle



Nicholas Callan



John Tyndall

Largest Battery in the World (1848) in Maynooth

- Zinc and cast iron
- Potassium Nitrate, Sulphuric acid and Water
 - 577 cells
 - Over 1,000 volts

<https://www.robertboyle.ie/robert-boyle-summer-school/>



Edith Anne Stoney
(born Dublin 1869)

First woman medical physicist

<https://www.tcd.ie/physics/300/>

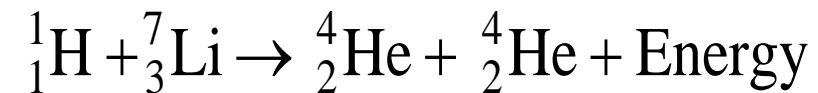


300

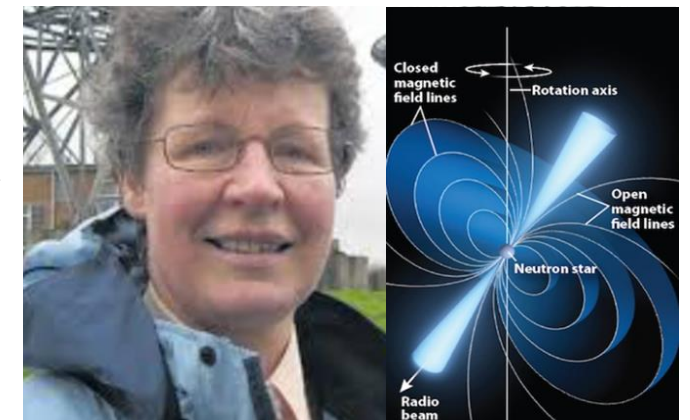
Tercentenary of Physics in Trinity | 1724 – 2024



Ernest Walton **split the nucleus** in 1932 with Cockroft



Jocelyn Bell Burnell
discovered **pulsars**
in 1967



Overview of Hub-99

Our Physics syllabus mentions:

Eye defects

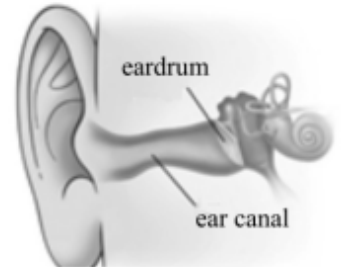
Hearing impairment

ECG

Diagnostic imaging

Some sample exam questions

The ear canal acts as a cylindrical pipe closed at one end. It is of average length 2.3 cm. The speed of sound in air is 340 m s^{-1} .
What is the fundamental frequency of the ear canal?



Blood pressure can be measured in many ways. One technique uses the Doppler effect; another uses strain gauges contained in Wheatstone bridges.



Eye

$$\frac{1}{f_1} + \frac{1}{f_2} = \frac{1}{f}$$

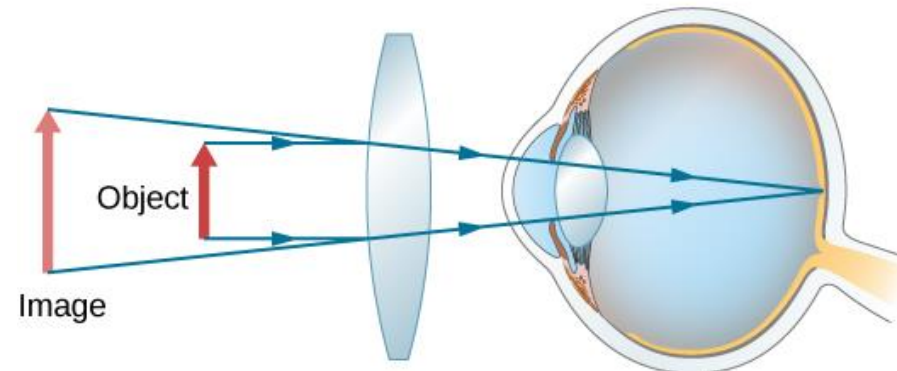
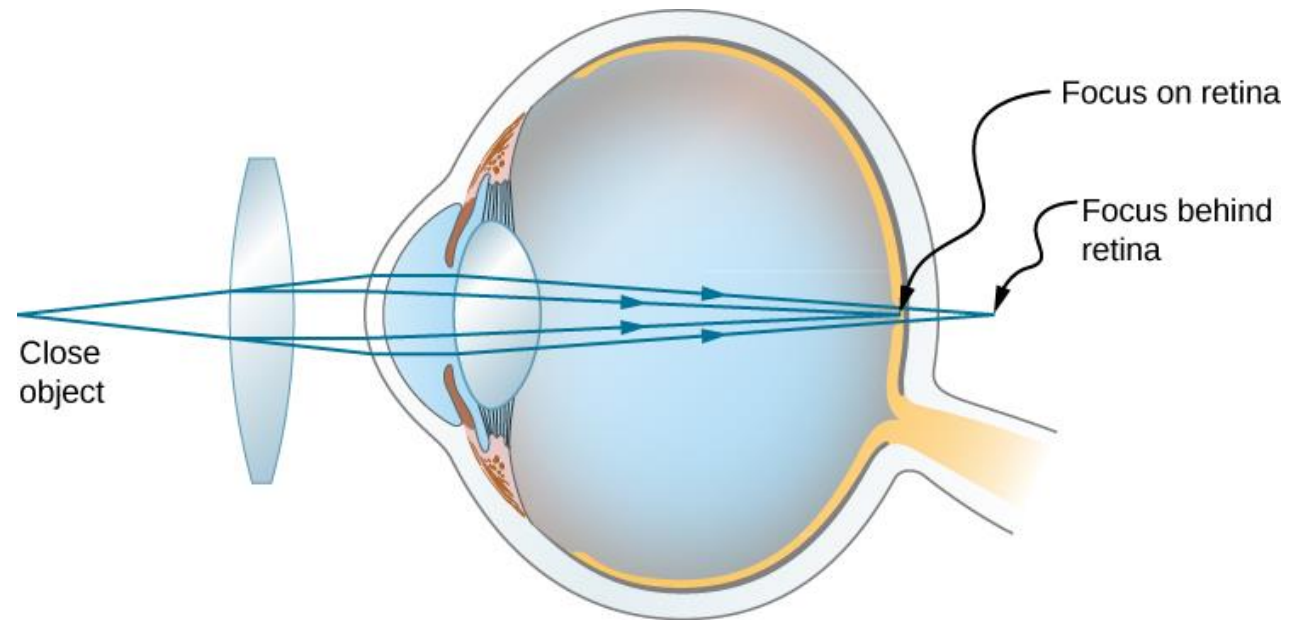
$$P_1 + P_2 = P$$

1. Myopia (Short-Sightedness):

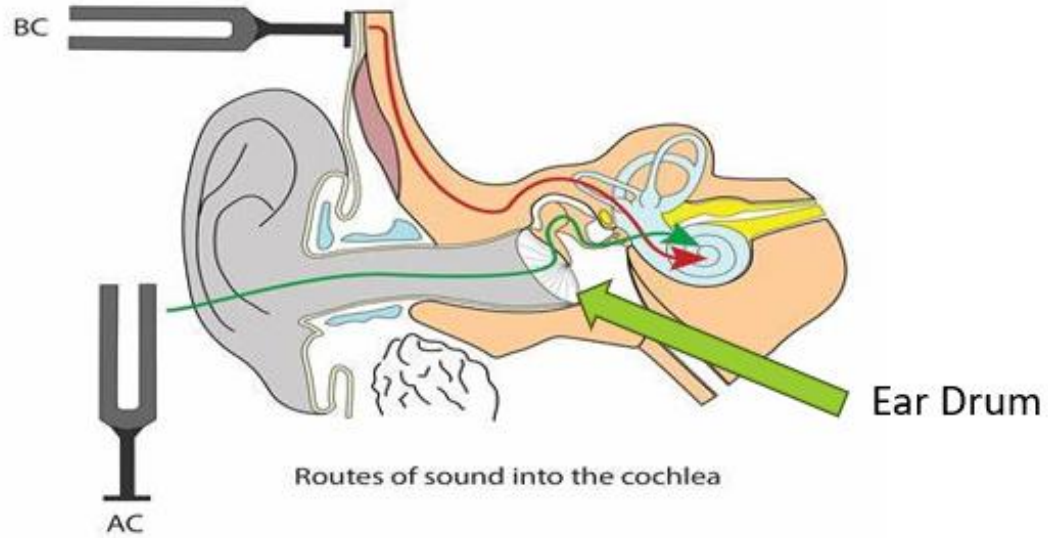
Symptoms: People with myopia can see near objects clearly but struggle to focus properly on distant objects. Myopia is corrected using a **concave lens**.

2. Hyperopia (Long-Sightedness):

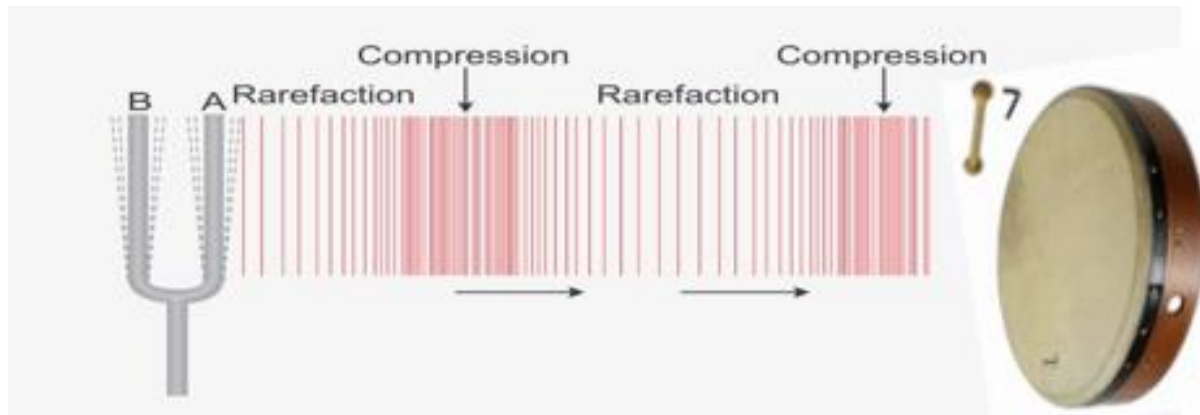
Symptoms: People with hyperopia can see distant objects clearly but struggle with near vision. Hyperopia is corrected using a **convex lens**.



Ear

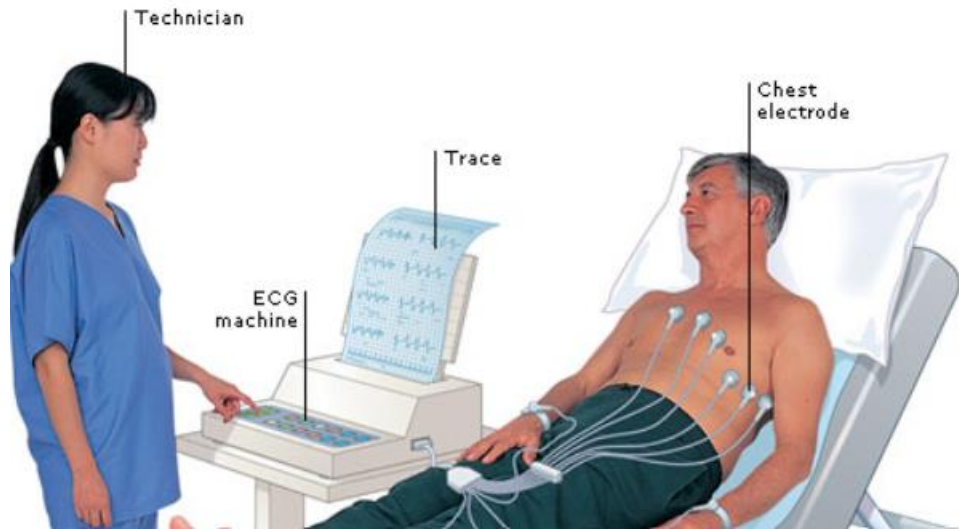


Range of human hearing is
20 to 20,000 Hz.



Bodhran
or
Drum

ECG Electro Cardio Graph



Defibrillators AEDs

External Defibrillators (AEDs):

(Automated External Defibrillators or AEDs) are used.

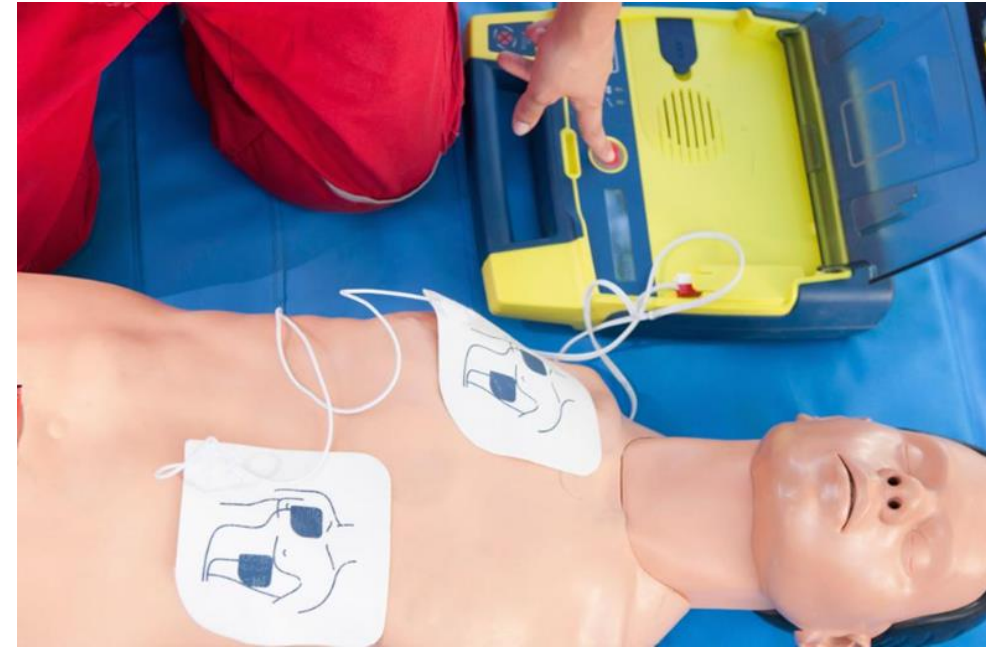
External defibrillators are used in emergency situations

Sticky pads containing **electrodes** are attached to the chest of someone experiencing cardiac arrest.

These **electrodes** send information about the person's heart rhythm to a computer in the AED.

The computer analyses the heart rhythm to determine if an electric shock is needed.

If necessary, the **electrodes** deliver one or more shocks to restore a normal heart rhythm

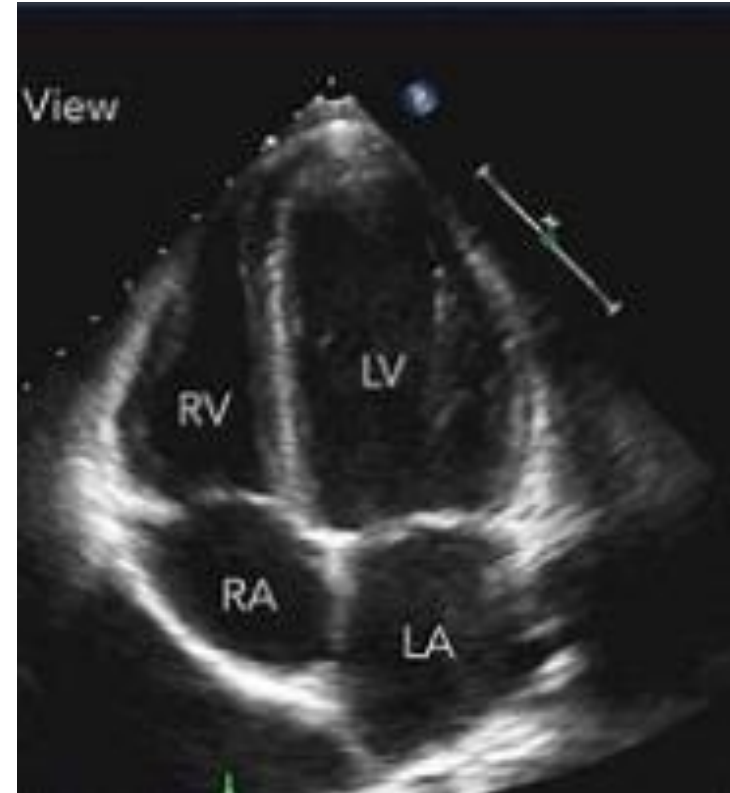


Ultrasound (20kHz to 20MHz)

Ultrasound is a safe medical imaging technique that employs high-frequency sound waves to create detailed images of internal body parts.

Uses include:

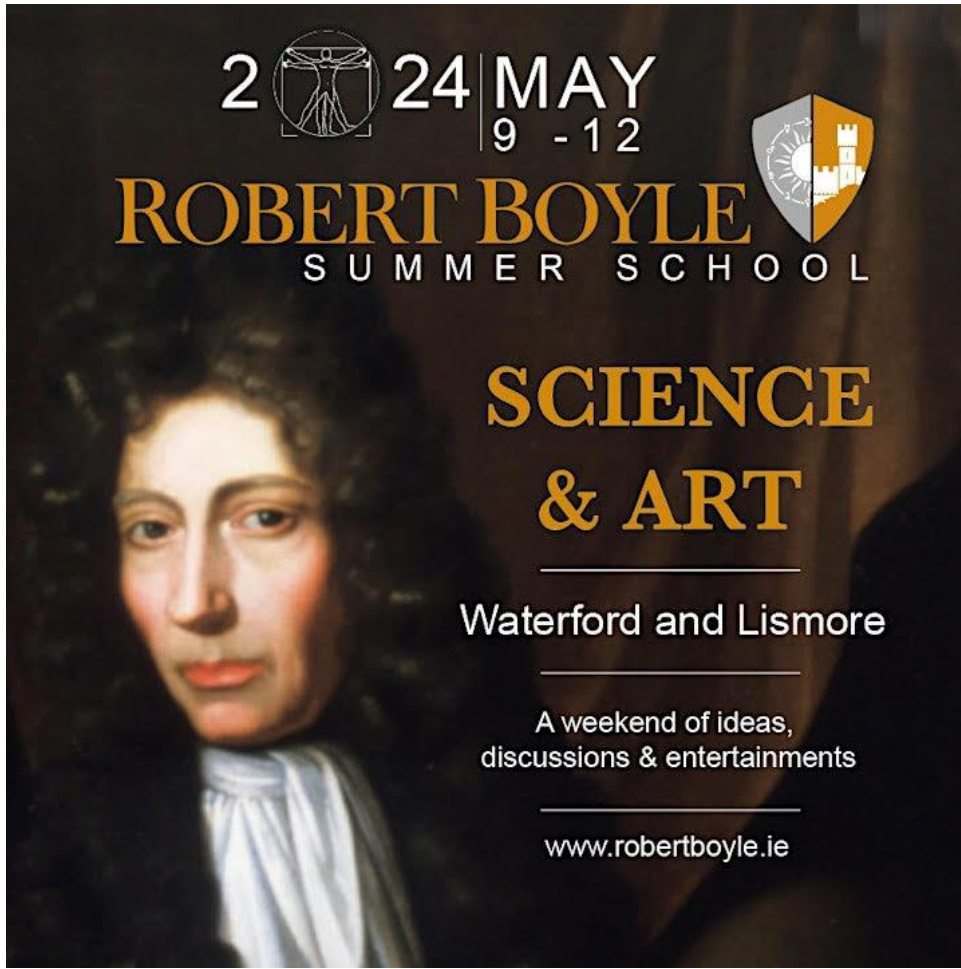
1. **Monitoring pregnancy:**
2. **Cardiac Imaging:**
3. **Breast check imaging**



Dr. Jennifer Gaughran shared her full presentation and also her solutions to 4 mathematical problems.

Both these documents were emailed to attendees.

Upcoming events



Booking and further information at:
<https://www.robertboyle.ie/robert-boyle-summer-school/>

Hub-100

2 May

Physics Miscellany

The next IOP Physics Hub

Next IOP Physics Hub will be on 2 May 2024

Booking for Hub-100 at:

<https://www.smartsurvey.co.uk/s/GQOT1C/>

or

<https://spark.iop.org/events>

Resources including Notes, Weblinks & Presentations
will be emailed to attendees and
will be available at the following link:

[IOP Physics Hub padlet](#)

IOP Physics Hub

<https://spark.iop.org/events>

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