Physics

a lifetime of opportunities

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Science at the University of Malta

- Biology
- Physics
- Chemistry
- Geo Sciences
- Mathematics
- Space Sciences and Astronomy
- Statistics and Operations Research
Why study Physics?

Interesting

Important

Career opportunities

There is a high demand for physicists in virtually all sectors of the economy.
Science at the University of Malta

Faculty of Science - Physics
What can you learn from a degree in Physics

Physics core
- Computer Architecture
- Numerical Skills

Problem Solving
- Critical Thinking
- Statistical Analysis

Software Development
- Time management, teamwork, communication skills, ...

Mathematics core
A lifetime of opportunities

**BSc**
Bachelor of Science

- **Academia**
  Postgraduate studies
  - Taught Masters,
  - Research Masters, PhD

- **Work in Industry**
  Scientists (R&D QA), Finance, Banking, Analysts, iGaming, Insurance, etc.

- **Work in Public Authorities**
  Scientists with ERA, PA, MCCAA (metrology), MCA, etc.

- **Work in the Government Sector**
  Medical Physicists, Scientists, Administration, Policy, Teaching, etc.
Industrial Careers

Manufacturing
Product design and modelling, quality assessment

IT Industry
Software development, optimization, model design

Environment
Energy industry, water management, monitoring (seismic, atmosphere, etc)

Actuary Science
Insurance, hedge fund manager, finance, banking

iGaming
Big data engineer, risk assessment, game developer

Medical Industry
Medical physics, drug design, quality control in drug manufacturing

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University of Malta
What do you need to get started?

**Physics (4 yrs – Joint Hons):**
- **Physics** – Advance at grade C or better
- **Pure Mathematics** – Intermediate at grade C or better
  or
- **Physics** – Intermediate at grade C or better
- **Pure Mathematics** – Advance at grade C or better

**Computational Physics:**
- **Physics** – Intermediate at grade C or better
- **Pure Mathematics** – Advance at grade C or better

**Physics (3 years – Single Hons):**
- **Physics** – Intermediate at grade C or better
- **Pure Mathematics** – Advance at grade C or better

To be offered in the near future

- Physics and Mathematics
- Physics and Statistics and Operations Research
- Physics, Medical Physics and Radiation Protection
- Physics and Geosciences
Research at the Department of Physics

Electromagnetics
- Medical applications of microwaves
- Antenna design
- Measurement and modelling of electromagnetic fields

Instrumentation
- Development of novel sensors in collaboration with industry
- Instrumentation design and support for research projects

Astronomy and Astrophysics
- Radio astronomy and Astroinformatics
- Galaxy formation and development
- Cosmology and modified theories of gravity

Quantum Optics and Condensed Matter
- Quantum Optics, Optomechanics, Quantum Thermodynamics
- Mesoscopic Quantum mechanics, Quantum Information
Electromagnetics Research Group (EMRG)

Anechoic chamber tests

Ablation of certain types of cancer

PET-CT showing solitary lung cancer nodule
Microwave applicator advanced into target
PET-CT one year following ablation shows no residual viable tumour.
Quantum Optics & Quantum Information theory

npj Quantum Information volume 6, Article number: 5 (2020)

Optomechanics
Quantum thermodynamics

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Graduate Researchers and Collaborations

Faculty of Science - Physics

University of Malta
The Radio Universe

Square Kilometre Array (SKA) will produce 10 times the current global internet traffic

Novel **machine learning** methods to detect new radio sources (star forming galaxies)!
Space Debris

The **Northern Cross Array** can see 10cm diameter objects at 2000 km.

An approximated **9000 kg of space hardware** are currently orbiting the Earth.
Galaxies and Observational Cosmology

Detecting the **earliest galaxies** in the Universe

Galaxy Morphology
Opening a window on the Universe

How did the Universe evolve?

What is the nature of gravity?

What are black holes?
Detecting **exoplanets** as they pass over their host star

Looking for the **goldilocks zone** in exosystems

**Huygens probe** landed on the planet **Titan** while measuring its atmosphere
Dr Deandra Cutajar

"My physics degree opened up a lot of opportunities. I landed a job in the gaming industry before submission of my PhD thesis. A degree in physics guarantees employment and provides an opportunity to understand rather than just knowing."

Byron Magri

"A physics degree equipped me with the ability to distil problems down to their essence, understand their root causes and implement their solution. It gives the right mix of analytical skill and intuition to tackle day to day challenges both in and out of the workplace."
Undergraduate Opportunities

• Summer Internships with industry
  - Abroad (IASTE)
  - Local

• Summer Internships with the University

• CERN internship
A History of Excellence

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