Why study Physics?

• Physics answers the big questions
  – Energy generation and distribution
  – Global warming
  – Environmental monitoring/protection
  – Health (Diagnostics and Therapeutics)
  – Quantum/optical computing
  – Nanoscience/nanotechnology
Why does one element in the periodic table underpin the technological developments in the information age?

Most traditional manufacturing processes use materials because of their intrinsic properties.

Scientists learned how to control the properties of silicon!
• Physicists provide leadership in:
  – Basic research
  – Commercial R&D
  – Education and Training
  – Finance/Market Prediction and Modelling
  – Industry, Business, Public Service
  – Engineering, Design, Innovation
Why study Physics?

- A physics degree provides a broad education
- Applicable to a wide variety of jobs
  - IT Literate
  - Problem Solving
  - Mathematical Modelling
  - Ability to think ‘outside the box’
It offers a challenging and rewarding career focused on the creation of new knowledge.

It requires the best and the brightest academic minds.

A scientific research career is an international passport.
Why Physics at DCU?

• DCU campus environment

• Excellent IT and Library Facilities
Why Physics at DCU?

• Great sports facilities including a 25 m pool
Why Physics at DCU?

• Modern, well-equipped student centre: The Hub

• State-of-the-art performance centre: HELIX
Why Physics at DCU?

- Purpose-built physics building
- Major investment in undergraduate laboratories
Why Physics at DCU?

• Academic staff from Ireland, UK, Germany, France, Netherlands, Russia, US and Australia

• High research publication rate per staff member.
Why Physics at DCU?

• Senior staff participate in research centres
  
  BDI, NCPST, PRECISION

• Two National Research Centres founded by School Professors
  
  NCPST, NCSR
Why Physics at DCU?

- International collaborations, for example:
  - CERN
  - DESY FEL
  - ITER
  - SOLEIL
  - DIAMOND
  - ASTRID
Why Physics at DCU?

• School is actively involved in Physics Education Research
• Physics staff have won President’s Teaching and Research Awards
• Every First Year has a personal academic tutor
Why Physics at DCU?

- Two Physics computing labs (Windows and UNIX)
- Continuous programme of facility upgrading
- School IT Manager
Why Physics at DCU?

• Dedicated Technical Staff

• Support Undergraduate Laboratories at all levels
Physics Degrees at DCU

- Physics with Biomedical Sciences  
  (DC173)

- Physics with Astronomy  
  (DC167)

- Applied Physics  
  (DC171)
<table>
<thead>
<tr>
<th>Year</th>
<th>Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Mechanics, Optics, Thermal Physics, Electricity and Magnetism, Chemistry, Computing, Labs and Projects</td>
</tr>
<tr>
<td>Year 2</td>
<td>Quantum Mechanics, Modern Optics, Electronics, Mathematics, Labs and Projects</td>
</tr>
<tr>
<td>Year 3</td>
<td>Wave Optics, Relativity, Quantum Mechanics, Statistical Mechanics</td>
</tr>
<tr>
<td>Year 4</td>
<td>Choice of Optional Topics, Final Year Project</td>
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Physics is of vital importance to the Biomedical fields

NMR / PET / CAT Scanners
Imaging Technology
Radiation Therapy / Nuclear Medicine
Diagnostic Devices
Laser Treatment
<table>
<thead>
<tr>
<th>Year 1</th>
<th>Chemistry, Physiology</th>
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</thead>
<tbody>
<tr>
<td>Year 2</td>
<td>Biology/ Biochemistry, Anatomy, Biomechanics</td>
</tr>
<tr>
<td>Year 3</td>
<td>Immunology</td>
</tr>
<tr>
<td>Year 4</td>
<td>Advanced Biomaterials and Processing, Laser Physics and applications, Project work in biomedical field</td>
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</tbody>
</table>
Physics is at the core of modern astronomy, both in terms of experimental apparatus, theory, and analysis of data.

Imaging Technology
Data Acquisition
Computational Physics
Cosmology and Relativity
Physics with Astronomy

<table>
<thead>
<tr>
<th>Year</th>
<th>Includes</th>
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<tbody>
<tr>
<td>Year 1</td>
<td>The Universe, Programming</td>
</tr>
<tr>
<td>Year 2</td>
<td>Advanced Programming, Relativity, Nuclear and Particle Physics, Optical Techniques, Space Science and Technology</td>
</tr>
<tr>
<td>Year 3</td>
<td>Galactic Astronomy, Stellar Physics</td>
</tr>
<tr>
<td>Year 4</td>
<td>General Relativity, Applied Spectroscopy, Digital Signal Processing, High Energy Astrophysics</td>
</tr>
</tbody>
</table>
General physics degree aimed at industrial R&D and fundamental and applied research

Semiconductor Physics
Digital Signal Processing
Optics and Photonics
Computer Modelling
Instrumentation / Measurement
Includes:

<table>
<thead>
<tr>
<th>Year 1</th>
<th>The Universe, Programming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 2</td>
<td>Advanced Programming, Solid State Physics, Electronics</td>
</tr>
<tr>
<td>Year 3</td>
<td>Semiconductor Physics, Wave Optics</td>
</tr>
<tr>
<td>Year 4</td>
<td>Quantum Electronics, Electrodynamics, Materials Growth and Characterisation, Solid State Physics, Photonics, Digital Signal Processing</td>
</tr>
</tbody>
</table>
Applied Physics
   Six month INTRA placement
Physics with Biomedical Sciences
   Six month INTRA placement (in hospital / biomedical industry)
Physics with Astronomy
   Field trip to foreign observatory
   Six month INTRA placement
• Lab Placement in School or Research Centre

• Opportunities to extend research placement via SFI UREKA

• Scholarship opportunities to spend a term in the US
Physics with Biomedical Sciences

HD3 or OB3 in Mathematics
HC3 in a Science subject

Points:
420 (cut off) - 2011
Physics with Astronomy

HD3 or OC3 in Mathematics
HD3 or OC3 in a Laboratory Science

Points:
370 (cut off) -2011
Applied Physics

HD3 or OC3 in Mathematics
HD3 or OC3 in a Laboratory Science

Points:
360 (cut off) -2011
Employment Prospects

Intel, Meteor, 
O₂, Eircom, AIB Group, 
Hibernian Group, FORFÁS, 
SFI, HP, Alcatel, RCSI, DIT, 
St. James’s/Mater/Tallaght Hospitals, Google, First Derivative….
DCU has responded to the need for a new generation of science teachers by preparing a new integrated curriculum including:

Science
Mathematics
Education
Information Technology
You have the option of entering the Physics programmes after a common first year on Common Entry into Science (DC201) – Cutoff points 400 - (2011)
Where will physicists be needed in the next 5-20 years?

- Computing? Computer Hardware?
- Internet? Mobile Communications?
- Finance? Science Teaching?
- Medical Physics? Research Scientist?

Physics graduates from DCU have followed all these career paths.
At DCU we have the

People

Facilities

Opportunities