



## Careers linked with particle physics

# Theoretical particle physicist

Theoretical particle physicists are **self-motivated** and **logical** as they develop mathematical and physical models linked with fundamental particles. They use the models to understand the interaction between matter and radiation. Theoretical particle physicists use observations made by experimental particle physicists in a **creative** way to develop theories that predict new phenomena.

### Science to know

Particle model | Energy Transfer | Wave properties

### Level

PhD degree

### Where theoretical particle physicists work

*IPPP - Institute for Particle Physics Phenomenology*

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this institute scan the QR code



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## Careers linked with particle physics

# Electronic engineer apprentice

Electronic engineer apprentices are **imaginative** and use science, maths and engineering skills to design and develop electronic devices. They need to be **organised** when they install or maintain electronic devices and machinery. Electronic engineer apprentices are **open-minded** as they will work with different teams on projects such as lasers, accelerators and space science.

### Science to know

Voltage & Resistance | Energy Transfer | Current

### Level

Apprenticeship

### Where electronic engineer apprentices work

*Vulcan Laser Facility*

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# Careers linked with particle physics

## Mechanical engineer

Mechanical engineers are **creative** when they develop a variety of components for particle accelerators. They are **hard-working** as they have to be involved in all stages designing, installing and testing these components. To develop new equipment, mechanical engineers need to **communicate** with other STFC teams working on different projects.

### Science to know

Pressure | Contact forces | Heating and cooling

### Level

University degree

### Where mechanical engineers work

CERN

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## Careers linked with particle physics

# Data scientist

Data scientists need to be **organised** to turn the huge amounts of raw data collected by experiments every day into meaningful information. They use different tools such as data mining, machine learning and statistics to extract, analyse and interpret data. Data scientists are **curious** and **passionate** about using data to solve problems.

### Science to know

Particle model | Energy costs | Energy Transfer

### Level

University degree

### Where data scientists work

*Fermilab*

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## Careers linked with particle physics

# Cloud architect

Cloud architects maintain and improve the systems used for cloud computing - any computing that takes place remotely via the internet. They are **collaborative** as they work with different teams to help them use cloud computing facilities. They need to be **open-minded** and **imaginative** to find ways to make sure that cloud computing is safe and secure.

### Science to know

Speed | Light | Energy costs

### Level

University degree

### Where cloud architects work

*SCD - Scientific Computing Department*

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## Careers linked with particle physics

# Accelerator physicist

Accelerator physicists are **passionate** about the many uses of accelerators to support particle physics, material science, manufacturing and medical applications. They are **imaginative** about finding ways to use particle accelerators for medical diagnostics, treatment and sterilisation. Accelerator physicists also need to be **observant** because accelerators often need to be calibrated to produce the right amount of particles.

### Science to know

Electromagnets | Particle model | Energy transfer

### Level

PhD degree

### Where accelerator physicists work

*ESS - European Spallation Source*

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## Careers linked with particle physics

# Beamline technician

Beamline technicians need to be **logical** to ensure that the equipment linked with beams of particles created by particle accelerators is correctly installed. They are **resilient** while they assist other teams at STFC to use the beamline to carry out experiments. Beamline technicians need to be **hard-working** to ensure that work is carried out in a safe manner using the correct processes.

### Science to know

Electromagnets | Wave Properties | Magnetism

### Level

A-Levels

### Where beamline technicians work

*ISIS Neutron and Muon Source*

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## Careers linked with particle physics

# Project manager

Project managers leading STFC research projects are **tenacious**. They **collaborate** with different teams to plan the research project, the budget and the schedule to complete the project on time. Project managers need to be good **communicators** and regularly report to other people on the progress and achievements of projects.

### Science to know

Speed | Energy costs | Climate

### Level

University degree

### Where project managers work

*Boulby Underground Laboratory*

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## Careers linked with particle physics

# Cryogenics technician

Cryogenics technicians need to be **logical** and **organised** because they are responsible for managing and operating the equipment used to cool matter to temperatures of  $-200^{\circ}\text{C}$  or lower. They contribute to projects such as developing supercooled magnets for accelerators and cooling space satellites. Cryogenic technicians are also **resilient** when they maintain equipment and rectify faults that occur.

### Science to know

Heating and Cooling | Magnetism | Energy transfer

### Level

A-Levels

### Where cryogenics technicians work

*LHC - Large Hadron Collider*

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## Careers linked with particle physics

# Energy manager

Energy managers are **self-motivated**, setting targets and implementing measures to ensure all experiments at STFC can be powered. They are **observant** as they monitor energy consumption and undertake audits of venues and equipment to see where energy costs can be made. Energy managers are **passionate** about controlling energy use to reduce the impact of organisations on the environment.

### Science to know

Energy costs | Earth resources | Climate

### Level

University degree

### Where energy managers work

CERN

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## Careers linked with particle physics

# Quality assurance engineer

Quality assurance engineers are **self-motivated** and oversee the construction, maintenance and modification of equipment used across STFC facilities. They have to be **patient** as they plan rigorous tests to investigate how well equipment is performing. Quality assurance engineers are **resilient** and document all of their findings and try to find solutions for any malfunctions.

### Science to know

Pressure | Contact forces | Electromagnets

### Level

University degree

### Where quality assurance engineers work

*DUNE - Deep Underground Neutrino Experiment*

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## Careers linked with particle physics

# Radiation protection supervisor

Radiation protection supervisors are **tenacious** because they must ensure that staff use ionising radiation safely. They need to be **observant** when they monitor contamination levels and radiation dose rates. Radiation protection supervisors are **patient** and create contingency plans in case of human exposure to ionising radiation or the damage, theft or loss of a radioactive source.

### Science to know

Particle model | Periodic Table | Cells

### Level

University degree

### Where radiation protection supervisors work

CERN

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## Careers linked with particle physics

# Diagnostic radiologist

Diagnostic radiologists are **observant** as they study images created by radiographic techniques to diagnose illness and injury. They are **organised** as they assess patients to find out which radiographic technique is the most suitable to their condition. Diagnostic radiologists need to be **open-minded** as they work with other healthcare professionals to provide the best support for patients.

### Science to know

Electromagnets | Cells | Elements

### Level

Masters or PhD Level

### Where diagnostic radiologists work

*ATLAS - A Toroidal LHC ApparatuS*

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## Careers linked with particle physics

# Vacuum processing technician apprentice

Vacuum processing technician apprentices need to be **observant** when they inspect components of the vacuum system in particle accelerators. They need to be **logical** because creating the vacuum is a process which requires many steps. Vacuum processing technician apprentices are also **curious** and investigate any changes from normal operating conditions which may affect the particle beam inside the accelerator.

### Science to know

Pressure | Energy Transfer | Heating and cooling

### Level

Apprenticeship

## Where vacuum processing technician apprentices work

CERN

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## Careers linked with particle physics

# Science communication officer

Science communication officers are **collaborative** and learn how technicians, engineers and scientists are contributing to STFC projects. They are good **communicators** explaining to the public why the science is important and what it means in an understandable way. Science communication officers are also **hard working** and need to meet deadlines for reports, news articles and social media updates.

### Science to know

Elements | Particle model | Electromagnets

### Level

University degree

### Where science communication officers work

*SURF - Sanford Underground Research Facility*

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## Careers linked with particle physics

# Embedded systems engineer

Embedded systems engineers are **creative** and design ways for different systems in particle accelerators (which may use different types of software) to work together. They often **collaborate** with engineers and scientists to understand how information should be transmitted across different systems and projects. Embedded systems engineers have to be **tenacious** when troubleshooting faults in the systems.

### Science to know

Energy transfer | Voltage & Resistance | Contact forces

### Level

University degree

### Where Embedded systems engineers work

*ALICE - A Large Ion Collider Experiment*

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## Careers linked with particle physics

# Experimental Particle Physicist

Experimental particle physicists are **imaginative** as they design and run particle accelerator experiments. They base their designs on models created by theoretical particle physicists. Experimental particle physicists are also **patient** and **tenacious** as they analyse the enormous quantities of data created by particle accelerators to find meaningful results.

### Science to know

Particle model | Energy Transfer | Wave properties

### Level

University degree

### Where experimental particle physicists work

*ATLAS - A Toroidal LHC ApparatuS*

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