

# Physics

## The Subject

Physics is an experimental science, as it seeks to explain the universe itself from the very smallest particles currently accepted as quarks, which may be truly fundamental to the vast distances between galaxies.

It's an important subject for those wishing to go on to study Physics, Medicine, Engineering or other sciences at university, but also very interesting for those who wish to understand the universe better.

Topics studied include Mechanics, Thermal Physics; Waves; Electricity and Magnetism; Circular Motion and Gravitation; Atomic, Nuclear and Particle Physics and Energy Production.

Physics is, above all, a human activity, and students need to be aware of the context in which physicists work.

The distinction between SL and HL is one of breadth and depth.

For the successful study of Physics in the IB Diploma Programme, a strong foundation and fluency in mathematics is essential.

## The Teachers



Søren Detlefsen (SD)



Karsten Wedel Madsen (KW)



Palle Bindzus Petersen (PP)

## Physics and theory of knowledge

In physics there are rich opportunities for students to make links to their TOK course. Knowledge questions are open ended questions about knowledge such as:

- When performing experiments, what is the relationship between a scientist's expectation and their perception?
- What is the role of imagination and intuition in the sciences?
- How do we distinguish science from pseudoscience
- How does scientific knowledge progress?

- What are the similarities and differences in methods in the natural sciences and the human sciences?

### **Physics and international-mindedness**

The scientific method in its widest sense, with its emphasis on peer review, open-mindedness and freedom of thought, transcends politics, religion, gender and nationality.

Increasingly there is a recognition that many scientific problems are international in nature and this has led to a global approach to research in many areas. The reports of the Intergovernmental Panel on Climate Change are a prime example of this. On a practical level, the group 4 project (which all science students must undertake) mirrors the work of real scientists by encouraging collaboration between schools across the regions.

The power of scientific knowledge to transform societies is unparalleled. It has the potential to produce great universal benefits, or to reinforce inequalities and cause harm to people and the environment. In line with the IB mission statement, group 4 students need to be aware of the moral responsibility of scientists to ensure that scientific knowledge and data are available to all countries on an equitable basis and that they have the scientific capacity to use this for developing sustainable societies.

### **Link to IBO subject brief**

<https://www.ibo.org/globalassets/publications/recognition/physicsHL2016englishw.pdf>