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# University of Pretoria Yearbook 2019

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## Particle and astroparticle physics 310 (PHY 310)

**Qualification** Undergraduate

**Faculty** [Faculty of Natural and Agricultural Sciences](#)

**Module credits** 18.00

**Programmes** [BSc Physics](#)

**Prerequisites** PHY 255 and PHY 263 and PHY 356

**Contact time** 1 practical per week, 1 discussion class per week, 2 lectures per week

**Language of tuition** Module is presented in English

**Department** Physics

**Period of presentation** Semester 2

### Module content

Relativistic kinematics, fundamentals of elementary particle physics, the four forces of nature and the Standard Model, beyond the Standard Model, early universe cosmology (inflation, baryogenesis), the Cosmic Microwave Background, high-energy astronomy (cosmic rays, gamma rays and neutrinos), gravitational waves, dark matter (evidence, candidates, detection), dark energy and the Standard Cosmological Model.

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