

# Astronomy & Astrophysics

ecouraging interest in science

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## Astronomy and astrophysics

- Astronomy vs astrology
- Astronomy vs astrophysics
- Observational astronomy
- Stellar astrophysics
- Galaxies and the universe
- Extraterrestrials – other life in the universe?

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## PHYS 132 (Introductory Astronomy), VUW course

- Elementary spherical astronomy
- Astronomical instruments: the telescope
- Stars and their measurable properties
- Correlations between stellar properties: the HR diagram
- The mass of stellar and sub-stellar objects
- Stellar interiors, energy sources and variability
- Stellar evolution
- Extrasolar planets
- Stellar death: white dwarfs, neutron stars & black holes
- Science history: eg black hole concept evolution
- Galaxies, cosmology and the big bang

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## Euclidian geometry is sometimes wrong!

- **Pythagorus**: right angle triangles

$$c^2 = a^2 + b^2$$

- **Pythagorus**: any triangle – the cosine rule

$$c^2 = a^2 + b^2 - 2ab \cos \theta$$

- **Spherical astronomy** – the surface of a sphere

$$\cos c = \cos a \cos b + \sin a \sin b \cos C$$

- **Riemann/Einstein's** curved **space-time**

$$ds^2 = dx^2 + dy^2 \quad (\text{Euclid}) \quad \longrightarrow \quad ds^2 = g_{\mu\nu} dx_\mu dx_\nu$$