Course Title:	**Statistics**
Number of hours/semester:	6h, 1st Semester
Number of ECTS:	-
Lecture outline, contents:	This course is a brief introduction to inference methods. We begin by introducing the distribution laws used in counting experiments (binomial, Poisson and Gauss distributions), which are found in many analyses in high-energy (astro)physics and cosmology. We then investigate how to model a data set governed by such laws. How can the model of a data set be chosen and parameterized? How can the best-fit parameters and associated uncertainties be identified? How can the quality of the fit be assessed? If the fit is appropriate, how can inference on the broader physical problem be made? Each session is divided into two parts: an initial lecture to familiarise students with the mathematical concepts underlying statistical inference, and a hands-on session to implement these concepts using Python libraries that are standard in the scientific fields covered by NPAC, namely *emcee* and *iminuit*. *Keywords*: probability density function, Bayesian / frequentist, likelihood, χ^2, covariance, propagation of uncertainty.
Pedagogical methods:	Lectures and hands-on computer sessions
Prerequisites:	Some basic knowledge in descriptive statistics and in Python programming
Modalities of knowledge assessment:	-
Bibliography	1. Chapters “Probability” and “Statistics” of the Particle Data Group reviews, G. Cowan (2022), doi: 10.1093/ptep/ptac097 2. Numerical Recipes, 3rd Ed.: The Art of Scientific Computing, W. J. Press et al. (2007), isbn: 0521880688