

Annex 01 SPACE 1/2025, Cosmology, Space Science & Space Technology

Scientific sector:	PHYS-05/A
Contract duration (max 24 months):	24 months
Profile of the researcher to be hired:	The candidate must have a PhD degree with proven research experience carried out abroad. Two reference letters will be required. The candidate will be required to carry out his/her research activity in close collaboration with the SPACE Area of the Scuola Superiore Meridionale. He/she must also engage in the teaching and tutoring activities of the Scuola Superiore Meridionale, possibly holding courses within the PhD programs or the study program envisaged for undergraduate students.
Description of the research project on which the post-doc researcher will be engaged:	The research activity must be consistent with the scientific sector PHYS/05, with particular reference to Cosmology, Extragalactic Astrophysics and Relativistic Astrophysics. The candidate must have experience in formulating cosmological and astrophysical models to be compared with observations from large surveys and, in particular, with data of Large Scale Structure and Cosmic Background Radiation. The candidate must be able to manage archives of astronomical and cosmological data to test models of dark energy, inflation and theories of gravitation. In particular, the candidate has to deal with quantum effects in the early universe, as well as evaluate possible observables to be theoretically inferred as a consequence of a possible quantum signature (for example, particle production, baryogenesis, couplings with scalar and fermionic fields, etc.). The research activity will also be aimed at the design and development of algorithms and analysis tools for the management of large amounts of data from astrophysical observations.