Marie Skłodowska Curie Action – Postdoctoral Fellowship 2023
Expression of interest – Hosting offer
(MSCA-PF-2023)

Contact Person/Scientist in charge *(data of the principal investigator of the research group/lab or scientific supervisor)*	**Name**	Guilherme
	Surname	Leite Pimentel
	Email	guilherme.leitepimentel@sns.it
Laboratory /Department /Institute /Centre / *(data of the centre/department where the fellow would be located*	**Name**	Theoretical Physics Group, Scuola Normale Superiore
	Address	Piazza dei Cavalieri 7, 56126 Pisa
Research Area *(Please select one the following research areas: corresponding to the eight MSCA evaluation panels. You can select between one and up to three scientific areas per EOI)*		Physics (PHY)
Brief description of the Centre/Research Group *(max. 1,600 characters including spaces: information about the research centre or research group, scientific staff. Please include URL if possible)*		The research interests of the Theoretical Physics Group at SNS span a wide range of fields. We pursue fundamental questions related to cosmology, gravity, string theory, particle physics, and effective field theory. The group consists of faculty, post-docs, graduate students and affiliates. Current members are: Faculty: Guilherme Leite Pimentel, Augusto Sagnotti, Enrico Trincherini Postdocs: Adrien Kuntz PhD students: Bruno Bucciotti, Craig Clark, Marco Costa, Andrea Luzio, Salvatore Raucci, Francesco Serra, Tom Westerdijk, Chen Yang More information can be found at: https://www.heptheory.sns.it

Project description	Cosmological correlation functions are an important
(max. 1,800 characters including spaces: short description of the research project / research line where the fellow would be hosted and develop his /her project)	window into the beginning of the universe, encoding its initial conditions. There is a very active observational effort to measure this initial conditions with increasingly exquisite accuracy, as well as a blossoming research program of understanding the statistical properties of cosmological fluctuations from basic physical principles.
	In order to better characterize and compute cosmological correlation functions, a recent influx of ideas from several areas of theoretical physics (such as scattering amplitudes, conformal field theories, holography, etc.) have provided new tools allowing for analytic results that seemed out of reach. It is clear that we are scratching the surface of a rich subject of decoding the natural mathematical structures behind perturbative cosmological correlators.
	The MSCA fellow would work on aspects of cosmological perturbation theory. Areas of potential focus could be: (i) the study of correlators of spinning particles in gauge theories and gravity, (ii) a deeper understanding of loop calculations of cosmological correlation functions, for formal and phenomenological applications, (iii) a ``bootstrap'' program for correlation functions of stochastic inflation.
Applications: documents to be submitted and deadlines *(Please indicate the documents that the candidate fellow should submit to establish contact: CV, letter of motivation, letter of references, etc., please indicate deadline. Recommended deadline: April 2023)*	CV, letters of reference Deadline: May 2023