Code B_2715

Department	Mechanical, Chemical and Material Engineering
UniCa reference person	Michele Brun
Project title in English	StaM: Statistical effects due to thermal fluctuations in Mechanical system
Project title in Italian	StaM: Effetti statistici dovuti ad effetti termici in sistemi Meccanici
Subject area of reference (World University Ranking)	ENGINEERING AND TECHNOLOGY
Project summary and VPS' profile	Despite the wide diffusion of statistical techniques, the approaches that allow to study the effects of thermal fluctuations on mechanical systems are rather limited. The interaction involves different length scales, where deterministic and statistical effects are important. The project is focused on the evaluation of the effects of thermal fluctuations on different mechanical phenomena. These are well understood at the continuum macroscale, but still requires an explanation from statistical methods and probability theory of large assemblies of microscopic entities without assuming or postulating any natural laws, but explains the macroscopic behavior of nature from the behavior of such ensembles. Applications may include brittle and ductile fracture propagation, entropy production and reciprocity relation, stick-slip properties and friction, wave propagation and plasticity in micro-structured media. The project will bring together the expertise from different fields, including mechanical and electrical engineering, physics, mathematics and material science. The seminal models of advanced materials and structures developed in the project will be studied with both analytical and numerical approaches and the design of possible experimental demonstrations will be also an argument of investigation. We look for a Full/Associate Professor or equivalent research positions, with high experience in multidisciplinary physics including mechanics. His/her main expertise can be in the fields of Physics, Applied Mathematics, Mechanical/Civil/Electrical/Aerospace Engineering. The candidate will disseminate his/her knowledge to students in seminars or short courses. He/she will collaborate with the research group in the department and will interact with PhD, MSc and BSc students.
Proposed length of stay	Short visit of 6 days
Expected period of activity	June/September 2024
Academic position of the VPS'	Professor
Course of Study	Laurea magistrale (2nd cycle University Degree), Dottorato di ricerca (PhD Course)
Language of instruction	English