

ANNEX 7

ID NUMBER	MPHS_7
PHD TITLE	MATHEMATICAL AND PHYSICAL SCIENCES FOR ADVANCED MATERIALS AND TECHNOLOGIES
AVAILABLE POSITIONS	1 SSM Doctoral Fellowship
	5 PNRR Doctoral Fellowships (on research themes relevant for the PNRR)
	1 PNRR Doctoral Fellowships – Public Administration (on research themes relevant for the specific PNRR subprogram)
	1 PNRR Doctoral Fellowship – Digital and Environmental Transition (on research themes relevant for the specific PNRR subprogram)
PHD AND SELECTION FEATURES	<p>The Ph.D. program in Mathematical and Physical Sciences for Advanced Materials and Technologies consists in a 4 years study and activity path characterized by a multidisciplinary training. It combines fundamental disciplines, such as Mathematics and Physics, with applied engineering disciplines involving various aspects of Materials Science. The program is aimed both to students interested in a theoretical, qualitative and numerical study of the models used in Materials Sciences and to students interested in the study and development of frontier technologies in disciplines such as physics of matter, fluid dynamics, thermodynamics of materials and electronics. The admission to the Ph.D. program is granted after passing a public competition based on qualifications, a scientific report and an interview. A Selection Committee will examine the qualifications and the scientific reports of the applicants. A score of maximum 60 points will be assigned at this stage. Then a short list of applicants will be admitted to the interviews, where a score of maximum 40 points will be assigned to each candidate.</p>
DESCRIPTION OF THE RESEARCH LINES OF THE DOCTORAL PROGRAM	<p>The objective of this Ph.D. program is to train highly qualified researchers and professionals to an interdisciplinary approach to a wide range of problems in Materials Science. To this end we offer a first year of training and study aimed to strengthen the students' mathematical background in topics such as partial differential equations (including stochastic PDEs), differential geometry, calculus of variations, and the students' background in topics such as mechanics, elasticity, physics of matters, fluid dynamics, thermodynamics of materials, micromagnetism, electronics. After the first year, students select the topic on which they intend to carry out their research program. On one hand they may choose a mathematically oriented path aimed to carry on research on the mathematical models, tools and theories of interest to Materials Sciences. On the other hand, they may choose a physics-engineering path aimed carry on research on topics such as: liquid crystals, epitaxial growth of thin films, nanotubes growth, hysteresis of nanostructured surfaces, micromagnetic phenomena, plasmonics, spintronics, nonlinear optics, rheology, fluid dynamics of Newtonians and viscous liquids, transport of gases and vapors in polymers, transport of particles in polymeric matrices.</p> <p>Recipients of PNRR-funded scholarships are expected to be involved in one of the research topics outlined in the PNRR plan, for more information see https://www.governo.it/sites/governo.it/files/PNRR.pdf). These topics focus on the development of knowledge, including applied knowledge, in public research institutions.</p>
SCIENTIFIC COORDINATOR	Prof. Nicola Fusco

SCIENTIFIC REPORT TO BE ATTACHED TO THE APPLICATION	Scientific report in English (max. 2,500 words/15,000 characters, short bibliography included) with a description of the topic of the master's thesis or a scientific topic addressed subsequently by the candidate in the course of her/his experience, divided into sections illustrating the state of the art, objectives, results obtained, methodology used, and possible future developments.
COURSE LENGTH (IN YEARS)	4
ANNUAL GROSS AMOUNT OF THE SCHOLARSHIP	€ 19,000 + 50% increase of the monthly installment of the fellowship for stays abroad (for a maximum of 12 monthly installments)
RESEARCH BUDGET	10% of the fellowship in the first year, 20% of the fellowship in the three following years.
E-MAIL ADDRESS FOR INFORMATION	mphys@ssmeridionale.it
PROGRAM'S WEBPAGE	https://www.ssmeridionale.it/it-it/dottorato/rubriche/mathematical-and-physical-sciences-for-advanced-materials-and-technologies-mphys-3122-1-ec0ae85c1f4e17a600e2164778b04bfd
WEBSITE FOR INFORMATION AND NOTIFICATIONS TO CANDIDATES	https://www.ssmeridionale.it/en-us/la-scuola/bandi-di-concorso/dottorati