

AEROSPACE ENGINEERING

IIT - System design and component analysis of a space-based solar power station for providing power to Earth or Moon

Funded By	FONDAZIONE ISTITUTO ITALIANO DI TECNOLOGIA [Piva/CF:09198791007]
Supervisor	ROMANO MARCELLO - marcello.romano@polito.it
Contact	Remo Proietti Zaccaria (IIT)
Context of the research activity	<p>The activity will focus on energy wireless harvesting/transfer for Space applications with three main chapters: i) system level astrodynamics (orbital and attitude dynamics modeling and control), as well as the preliminary design of a space-based solar power collection and retransmission station to provide electrical power at the Earth or Moon surface; ii) System-level preliminary analysis of the state of the art in energy harvesting/transfer at high frequency, understanding of the existing modeling and realization of a model going beyond the present limits; iii) mission analysis, with emphasis on selected scenarios (to be determined during the early phase of the study). Type of research work: system analysis and trade-off, astrodynamics modeling, opto-electronics modeling.</p>
Objectives	<p>The objective is to realize a full system-engineering model of a space-based solar power station for providing power to Earth or Moon, which includes a high-fidelity model of wireless energy collecting/transfer at high frequency.</p>
Skills and competencies for the development of the activity	<p>The candidate should have a Master degree in Physics, Aerospace Engineering, Applied Mathematics or similar discipline. Analysis, synthesis, and independent problem solving capability is a need. Knowledge of simulation tools such as Matlab, Python, Comsol Multiphysics, FENICS, will be positively considered. Experience with Linux, and LaTeX is useful. Fluency in English, both spoken and written, is required.</p>