



# PhD in FISICA / PHYSICS - 40th cycle

## THEMATIC Research Field: DEVELOPMENT OF FUNCTIONAL BARRIER FOR PEROVSKITE SOLAR CELLS

**Monthly net income of PhDscholarship (max 36 months)**

**€ 1400.0**

In case of a change of the welfare rates during the three-year period, the amount could be modified.

**Context of the research activity**

**Motivation and objectives of the research in this field**

Lead halide perovskites are promising semiconducting materials for solar energy harvesting. However, the presence of heavy-metal lead ions is problematic when considering potential harmful leakage into the environment from broken cells and also from a public acceptance point of view. Moreover, strict legislation on the use of lead around the world has driven innovation in the development of strategies for recycling end-of-life products by means of environmentally friendly and cost-effective routes. Lead immobilization is a strategy to transform water-soluble lead ions into insoluble, nonbioavailable and non transportable forms over large pH and temperature ranges and to suppress lead leakage if the devices are damaged.

This project will focus on the development of encapsulant materials which are able to

- 1) protect lead-free perovskites from oxidation;
- 2) capture lead in case of device failure.

**Methods and techniques that will be developed and used to carry out the research**

- Materials solution and vacuum processing
- Wet chemistry
- Analytical chemistry
- Electronic microscopy
- Electronic characterization

**Educational objectives**

- Material science
- Optoelectronics
- Inorganic chemistry



<b>Job opportunities</b>	<ul style="list-style-type: none"> <li>- PV industry</li> <li>- Energy related technologies industry</li> <li>- academia</li> </ul>
<b>Composition of the research group</b>	1 Full Professors 2 Associated Professors 3 Assistant Professors 4 PhD Students
<b>Name of the research directors</b>	Dr. Annamaria Petrozza

<b>Contacts</b>
Annamaria.petrozza@iit.it

<b>Additional support - Financial aid per PhD student per year (gross amount)</b>			
<b>Housing - Foreign Students</b>	<b>1st year</b>	<b>2nd year</b>	<b>3rd year</b>
	1000.0 € per student	1000.0 € per student	1000.0 € per student
max number of financial aid available: 1, given in order of merit (only for students with scholarship)..			
<b>Housing - Out-of-town residents (more than 80Km out of Milano)</b>	--		

<b>Scholarship Increase for a period abroad</b>	
<b>Amount monthly</b>	700.0 €
<b>By number of months</b>	6

<b>Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information</b>
<p><b>Educational activities:</b> Educational activities (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences). Financial aid per PhD student per 3 years: 5707,20 Euros</p> <p><b>Teaching assistantship:</b> There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.</p> <p><b>Computer and desk availability:</b> individual use computer and desk</p>