



## PhD in FISICA / PHYSICS - 40th cycle

### THEMATIC Research Field: EDIBLE ELECTRONIC DEVICES AND SENSORS

#### 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

<b>Motivation and objectives of the research in this field</b>	<p>The emerging field of edible electronics is creating great scientific resonance by envisioning a technology which is safe for ingestion, environmentally friendly, cost-effective, and degraded within the body after performing its function, either digested or even metabolized. Long-term opportunities include smart pharmaceuticals and direct food tagging. Sensors are key to such applications. We offer one scholarship in the framework of the ERC project "ELFO: Electronic Food" <a href="https://elfoproject.eu/">https://elfoproject.eu/</a>.</p>
<b>Methods and techniques that will be developed and used to carry out the research</b>	<p>The research will be performed within the "Printed and Molecular Electronics" group, led by Mario Caironi in the Center for Nano Science and Technology, of the Istituto Italiano di Tecnologia. The study will require the fabrication and characterization of edible electronic devices (transistors) and sensors, especially targeted to sense parameters in the gastrointestinal tract (pH, temperature, pressure, different biomarkers).</p>
<b>Educational objectives</b>	<p>Expanding the knowledge of the electronic properties of food and food derivatives, learning solution-based fabrication techniques, exploring the toxicological properties of synthetic carbon based materials, developing sensor science with edible components, working in a multidisciplinary field.</p>
<b>Job opportunities</b>	<p>Edible Electronics is new multidisciplinary research field, providing a great opportunity to be exposed to several different environments, from academia to industry. Careers in academia, in industry, industrial R&amp;D and</p>



	consulting are possible.
<b>Composition of the research group</b>	1 Full Professors 0 Associated Professors 6 Assistant Professors 9 PhD Students
<b>Name of the research directors</b>	Mario Caironi, Alessandro Luzio

<b>Contacts</b>	
<p>mario.caironi@iit.it alessandro.luzio@iit.it</p> <p><a href="https://www.iit.it/research/lines/printed-and-molecular-electronics">https://www.iit.it/research/lines/printed-and-molecular-electronics</a><a href="https://elfoproject.eu/">https://elfoproject.eu/</a></p>	

<b>Additional support - Financial aid per PhD student per year (gross amount)</b>			
	1st year	2nd year	3rd year
<b>Housing - Foreign Students</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: max 5707,20 euros per student.</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 or shared use computer and desk</p>