



PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 41st cycle

Research Area n. 2 - Electronics

THEMATIC Research Field: SINGLE PHOTON DETECTORS FOR HIGH COUNT RATE APPLICATIONS

Monthly net income of PhDscholarship (max 36 months)
1500.0
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	The PhD research will focus on the design of Single Photon Avalanche Diode (SPAD) modules for high count rate applications. The detector modules should reach very high count rate, exceeding the present state of the art for silicon SPADs, and reaching at least 2 Gcps.
Methods and techniques that will be developed and used to carry out the research	The SPAD modules will be based on dedicated SPAD chips, designed and fabricated in scaled and advanced CMOS technologies. The modules will be optimized for each specific application, and its performance will be validated by experimental measurements, which will be carried out in collaboration with end-users with well-assessed expertise in the field.
Educational objectives	The PhD student will acquire in-depth skills in PCB design, programming FPGAs and microcontrollers, developing Graphical User Interfaces and developing optical set-ups for different applications.
Job opportunities	The research project will open many opportunities in the field of electronic circuit design, giving the possibility to proceed further in a researcher position or to work in a company.
Composition of the research group	2 Full Professors



	1 Associated Professors 0 Assistant Professors 9 PhD Students
Name of the research directors	Prof. Federica Alberta Villa

Contacts
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents	--

Scholarship Increase for a period abroad	
Amount monthly	750.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p><u>EDUCATIONAL ACTIVITIES</u> (purchase of study books and material, including computers, funding for participation in courses, summer schools, workshops and conferences).</p> <p><u>TEACHING ASSISTANTSHIP</u>: availability of funding in recognition of supporting teaching activities by the PhD student 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><u>COMPUTER AVAILABILITY</u>: 1st year: Yes 2nd year: Yes 3rd year: Yes</p> <p><u>DESK AVAILABILITY</u>: 1st year: Yes 2nd year: Yes 3rd year: Yes</p> <p>Premiality Premialities will be recognized to the PhD candidate.</p>



Up to 1700 euro (gross amount) after the completion of the 1st year;
up to 1700 euro (gross amount) after the completion of the 2nd year;
up to 1700 euro (gross amount) after the completion of the 3rd year.

The premialities will be assigned provided that she/he demonstrates a significant contribution to the growth of scientific excellence, the industrial valorization of research, the networking and communication activities of the Department.