



# PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 40th cycle

Research Area n. 2 - Electronics

**THEMATIC Research Field: LOW-POWER DATA CONVERTERS FOR QUANTUM  
COMPUTING**

**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>	This research activity is within the field of data converters, targeting the design of CMOS ADCs for interfacing quantum computing processors. Operation at cryogenic temperatures is required with Gb/s data rates and power dissipation below 0.5mW/qubit.
<b>Methods and techniques that will be developed and used to carry out the research</b>	Requirements due to the specific application field will be derived from literature and the behaviour of already implemented CMOS ADC will be investigated to become familiar with the performance limitations of CMOS devices at cryo temperatures. The ADC architecture will be then selected and compact models will be developed to support the system development with the corresponding algorithms. The system will be then implemented in a chip and experimentally verified.
<b>Educational objectives</b>	The student will be trained in different disciplinary areas such as computing architectures, cryogenic electronics, integrated system analysis and verification, analogue design, chip assembly, testing measurements.
<b>Job opportunities</b>	Designer with major semiconductor companies and research centres.
<b>Composition of the research group</b>	4 Full Professors



	1 Associated Professors 5 Assistant Professors 10 PhD Students
<b>Name of the research directors</b>	Prof. Andrea L. Lacaita

<b>Contacts</b>
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<b>Additional support - Financial aid per PhD student per year (gross amount)</b>	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

<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><u>EDUCATIONAL ACTIVITIES</u> (purchase of study books and material, including computers, funding for participation in courses, summer schools, workshops and conferences): financial aid per PhD student. 5.707,20 Euro per student</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>