

Ph.D position Project EIPHI GS TACTICQ

Job title	PhD Research Position in Quantum Computing
Job type (PhD, Post-doc, Engineer)	PhD
Contract duration (months)	36 months
Qualifications (Master, Ph.D ...)	Master
Job hours (full time/ part time)	Full Time
Employer	UBFC Université Bourgogne Franche-Comté
Financing Institutions	Région Bourgogne Franche-Comté & Graduate School EIPHI
Host Laboratory	ICB Laboratoire Interdisciplinaire Carnot de Bourgogne
URL Host Laboratory	https://icb.u-bourgogne.fr/en/home-page/homepage/
Address Host Laboratory	ICB Site de Belfort
Job description	<p>Subject: Measuring Quantum entanglement and quantum contextuality with a Noisy Intermediate Quantum Computer</p> <p>The candidate will be working as a PhD student on a subject on quantum computing. The development of Noisy Intermediate Quantum (NISQ) computer allows us to test and measure on real quantum devices some physical properties like entanglement and contextuality. Entanglement and contextuality are two quantum properties that are considered as resources in quantum information theory. Even if it is not necessarily well understood, the role played by these resources in many quantum protocols and algorithms is fundamental. In this thesis this resources will be studied from a mathematical perspective but also tested on quantum computers through the cloud. For instance algebraic invariants can be used to measure or distinguish different classes of entanglement but their implementation and measure on a quantum device is not necessarily known. Similarly contextual inequalities have been implemented on NISQ computer but many other experiences can be conducted to characterise contextual configuration with the geometry of the symplectic polar space.</p>
Supervisor(s)	Dr. Frédéric Holweck
Candidate profile	The candidate should have a strong background in either mathematics, physics or computer science with interest and motivations to study quantum information and quantum computing. We expect the candidate to be comfortable in programming language such as Python
Keywords	Quantum computing, Entanglement, contextuality, Noisy Intermediate quantum computer
Application deadline	01/06/2022
Application Depending on the type of position	<p>Please send the following documents (all in one PDF file) by e-mail to Frédéric Holweck frederic.holweck@utbm.fr :</p> <p>1) For EU candidates: Copy of your national ID card or of your passport page where your photo is printed. For non-EU candidates: Copy of your passport page where your photo is printed.</p> <p>2) Curriculum Vitae (may include hyperlinks to your ResearchID, Research Gate Google Scholar accounts).</p> <p>3) Detailed list of publications (may include hyperlinks to DOI</p>

	<p>of publications).</p> <p>4) Letter of motivation relatively to the position (Cover Letter) in which applicants describe themselves and their contributions to previous research projects (maximum 2 pages)</p> <p>5) Copy of your Master degree if already available.</p> <p>6) Coordinates of reference persons (maximum 3, at least your master thesis supervisor): Title, Name, organization, e-mail.</p> <p>If you have questions regarding the application, please contact the supervisor.</p>
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