

### JOB OFFER

Position in the project:	<b>Researcher for the Maestro project no. 2021/42/A/ST2/0035</b>
Scientific discipline:	Quantum Physics
Job type (employment contract/stipend):	<b>Part-time employment</b> <i>financed by the National Science Center</i>
Number of positions offered:	1
Remuneration/stipend amount/month:	PLN ~ 2 000 gross <i>Per month</i>
Position starts on:	<b>September 1<sup>st</sup> 2022</b>
Maximum period of contract	<b>56 months</b>
Institution:	<b>International Centre for Theory of Quantum Technologies, University of Gdansk, Poland</b>
Project leader:	<b>Prof. dr hab. Paweł Horodecki</b>
Project title:	Relativistic Causality and Information Processing (in Polish: Przyczynowość relatywistyczna a przetwarzanie informacji)
Project description:	<p><b><u>About ICTQT</u></b></p> <p>We are looking for the <b>Postdoctoral Researcher</b> to work in New Quantum Resources Group at the International Centre for Theory of Quantum Technologies (ICTQT).</p> <p>ICTQT was created in 2018 within the International Research Agendas Programme of the Foundation for Polish Science co-financed by the European Union from the funds of the Smart Growth Operational Programme, axis IV: Increasing the research potential (Measure 4.3). The founders of ICTQT are Marek Żukowski (the director) and Paweł Horodecki (the research group leader). The Centre's official partner is IQOQI-Vienna of the Austrian Academy of Sciences.</p> <p><b>The Centre consists of 6 groups:</b> Multiphoton Quantum Optics for Quantum Information (leader Marek Żukowski); New Quantum Resources (leader Paweł Horodecki); Foundational Underpinnings of Quantum Technologies (leader Ana Belen Sainz); New Quantum Resources and Thermodynamics (leader Michał Horodecki); Quantum Cybersecurity and Communication (leader Marcin Pawłowski); Quantum Open Systems in Relation to Quantum Optics (leader Łukasz Rudnicki).</p> <p>More about the research groups please find at you will find here: <a href="https://ictqt.ug.edu.pl/">https://ictqt.ug.edu.pl/</a></p> <p><b><u>About the group</u></b></p> <p>The broad aim of the New Quantum Resources Group would be to perform research concerning quantum phenomena which could be used for quantum information processing.</p> <p><b>Exemplary goals of the group are:</b></p> <ul style="list-style-type: none"> <li>- Connections between quantum computational speedup and contextuality/Bell-“nonlocality”</li> <li>- New protocols on randomness amplification</li> </ul>

	<ul style="list-style-type: none"> <li>- Research on communication networks</li> <li>- Connections between violations of Bell inequalities and of non-contextuality and the quantum advantage in communication complexity</li> <li>- Quantum batteries as open quantum systems</li> <li>- Relativistic quantum information processing</li> </ul> <p><b>About the “Relativistic Causality and Information Processing” project:</b></p> <p>The project’s central goal is to study the information-processing properties within the broad framework of „within-and-beyond-quantum” theories (relativistic quantum physics, PR-boxes, GPTs, etc.). To this end an integrative methodology combining the tools from i.a. quantum information, quantum field theory, relativity and cryptography will be developed. Finally, protocols for physical implementations and/or simulations of some of the theoretical findings will be developed.</p> <p>PhD students positions are offered by the International Centre for Theory of Quantum Technologies of the University of Gdansk within the implementation of the Maestro project entitled “Relativistic causality and information processing. The project is financed by the National Science Centre (NCN).</p>
Key responsibilities include:	<ol style="list-style-type: none"> <li>1. Active scientific research.</li> <li>2. Presentation and discussion of ideas and results with a diverse audience at the ICTQT and at the external events.</li> <li>3. Participation in mentoring of PhD students.</li> <li>4. Participation in activities organized by the ICTQT.</li> <li>5. Active participation in seminars, group meetings, etc.</li> </ol>
Profile of candidates/requirement	<ol style="list-style-type: none"> <li>1. PhD degree in physics, mathematics or computer science</li> <li>2. proven scientific record</li> <li>3. experience in at least one of the following domains: measure theory, spacetime geometry, quantum information.</li> <li>4. The candidate should be committed to working collaboratively within inclusive and diverse environment.</li> <li>5. Good written and oral communication skills are appreciated.</li> </ol>
We offer:	<ol style="list-style-type: none"> <li>1. Employment in a rapidly developing unit, the International Centre for Theory of Quantum Technologies at the University of Gdansk.</li> <li>2. possibility of accommodation with the family</li> <li>3. Scientific and organizational support.</li> <li>4. Basic equipment and core facilities.</li> <li>5. Friendly, inspiring, interdisciplinary environment.</li> </ol>
Required documents:	<ol style="list-style-type: none"> <li>1. curriculum vitae;</li> <li>2. a research resume with a list of research projects in which the candidate took part (with specification of the role); PDF files of publications (if there are any); A list of talks at conferences and workshops, and a list of prizes and awards;</li> <li>3. Documents confirming scientific degrees (copy of PhD diploma, or equivalent);</li> </ol>
Please submit the documents to:	<b>ictqt@ug.edu.pl</b>
Application deadline:	<b>18.07.2022</b>