

Scientific Area	Quantum interfaces
Topic title	Light-matter quantum dynamical interplay in CQED with ultracold gases
Main host institution	University of Strasbourg https://www.unistra.fr/
Supervisor/institution	Dr Tom Bienaimé https://eqm.cesq.fr/index.php/tom-bienaime/
Co-Supervisor/institution	Matthieu Le-Tacon / Karlsruhe Institute of Technology: https://www.iqmt.kit.edu/english/21_529.php
Mentor¹/institution	TBC
Secondment institution	TBC
Topic description	
<p>An ultracold atomic gas placed inside a high-finesse cavity enables for in-depth exploration of the quantum dynamics at play between light and matter in the extreme regime of strong coupling. Indeed, on such an experimental platform, one can measure in a complementary way the correlations of the light field leaking out of the cavity (photonic degrees of freedom) as well as probing the spacial structuring of the atomic density (matter degrees of freedom). Having access simultaneously to these two observables provides invaluable insights to the understanding of these complex and coupled quantum systems.</p>	
Recommended applicant's profile	
<p>Strongly motivated student interested in exploring experimental quantum optics on an ultracold atom platform.</p> <p>Solid background in physics and quantum mechanics. Ideally (but not mandatory), basic knowledge of atomic physics and previous experiences working in a labs with optics and lasers during internships in optics and laser physics.</p>	

¹ Mentor: The primary role of the mentors will be to identify and facilitate specific training objectives, advise on any problems faced by the DC, including career matters with an external perspective and provide mediation in the case of disputes.