



Call 2017

# CEBBEC

**Controlling EPR and Bell correlations in  
Bose-Einstein condensates**

*Chris Westbrook*



# CEBBEC highlights

**CHALLENGE** – achieve quantum enhanced atom interferometers with spatially separated paths. Success implies enhanced accelerometers and gyrometers



**SOLUTION** – production of two-mode squeezed atomic states, as and improved parameter estimation

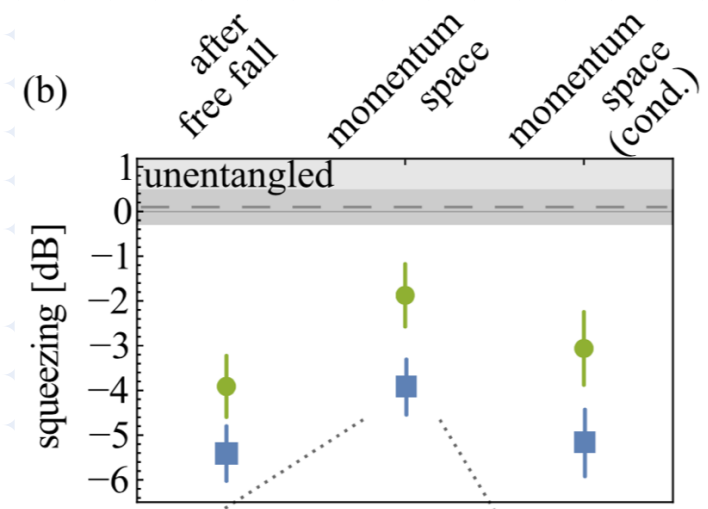


**PLANNED AND SURPRISING/UNPLANNED**



**OUTCOMES** – spatially separated two-mode squeezed states

(Anders et al. Phys. Rev. Lett. 2021)



# IMPACT (RRI aspects)



**GENDER:** 1 female project leader (TUW) who left to take a permanent position in France (CEA). 2/8 hired postdocs female.



**OPEN SCIENCE:** all results published in open access publications (at least arXiv)



**SCIENCE EDUCATION:** extensive participation in post-secondary education concerning quantum metrology, optics and technology



**PUBLIC ENGAGEMENT:** regular participation, especially at LCF and TUW groups in open houses and school visits to laboratories



# IMPACT (potential users)

**RELEVANT INDUSTRY BRANCH:** Navigation and defense



**KEY COMMERCIALY RELEVANT APPLICATIONS:** atom interferometry for accelerometers, gyrometers and gravimeters



**EXISTING/POTENTIAL END USERS:** Thales Research and Technology (Palaiseau, FR), project to realize atom chip based accelerometer and gyro. Close collaboration with LCF. Project leader and recent hire were PhD students in the LCF group



# QUANTERA

ERA-NET Cofund in Quantum Technologies



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 731473.