Contribution ID: 2

## Talbot interferometry with a point-like source: rationale, technology, & experiment

Monday, 23 March 2015 11:30 (45 minutes)

We are building a matterwave interferometer for 10<sup>6</sup> amu particles with 200 nm separation to test the superposition principle for massive particles [1]. A successful demonstration would correspond to a macroscopicity [2] mu=18 and would begin to constrain CSL lambda\_CSL<1.4  $\cdot$ 10<sup>r</sup> -11 Hz. I will outline the theoretical approach, describe the rationale for our design choices, and review the experimental progress so far. For particles in free-flight, our target mass appears to be a practical maximum for earth-bound experiments; I will briefly mention the MAQRO consortium which seeks to put an experiment like ours into space [3] References

[1] Bateman, Nimmrichter, Hornberger, Ulbricht, Nat. Comm. 5, 4788 (2014)

[2] Nimmrichter & Hornberger, Phys. Rev. Lett. 110,160403 (2013)

[3] Kaltenbaek et al., Exp. Astro. 34, 123 (2012).

Presenter: BATEMAN, James (University of Southampton)

Session Classification: Quantum interferometry