



Physical Sciences Seminar

Levitated Optomechanics with Rotating Nanoparticles

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Host: Misha Lemeshko

Using laser fields to levitate aspherical nanoscale particles offers an attractive route towards ultra-sensitive torque sensors [1] and fundamental tests of quantum mechanics. In this talk I will present the theory of ro-translational optomechanics [2] and environment-induced orientational decoherence [3,4]. I will argue that cooling the rotation of aspherical nanoparticles into the quantum regime is feasible and opens the door for the observation of orientational quantum revivals [5], a complete recurrence of its initial orientation after integer multiples of a characteristic revival time.[1] S. Kuhn, B. A. Stickler, A. Kosloff, F. Patolsky, K. Hornberger, M. Arndt, and J. Millen, Nat. Commun. 8 1670 (2017)[2] B. A. Stickler, S. Nimmrichter, L. Martinetz, S. Kuhn, M. Arndt and K. Hornberger, Phys. Rev. A 94 033818 (2016)[3] B. A. Stickler, B. Papendell, and K. Hornberger, Phys. Rev. A 94, 033828 (2016)[4] B. A. Stickler, B. Schrinski, and K. Hornberger, Phys. Rev. Lett. (accepted) arxiv:1712.05163 (2018)[5] B. A. Stickler, B. Papendell, S. Kuhn, J. Millen, M. Arndt, and K. Hornberger, arXiv:1803.01778 (2018)

Monday, October 1, 2018 11:00am - 01:00pm

Big Seminar room Ground floor / Office Bldg West (I21.EG.101)



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