## Seminar/Talk

# Large momentum transfer Raman atom interferometer without k-reversal AND Common Scientific Meeting

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Host: Onur Hosten

Alternating the propagation direction of the Raman light (k-reversal) has been essential for implementing traditional large momentum transfer (LMT) for a Raman atom interferometer, where a series of light pulses are used to perform both /2-pulse and -pulse. In this talk, I will present our method of performing LMT without k-reversal [1]. We use microwave /2-pulse and Raman -pulse to perform LMT, which uses the same principle as shown in the original Spin-Dependent-Kick interferometer [2]. However, we applied an additional microwave  pulse in the middle of the interferometer sequence to reverse the spin states, which allows closing of the interferometer arms by the same Raman light -pulses without k-reversal. I will present a proof-of-principle demonstration of a 4hk atom interferometer and discuss its scalability to 4Nhk. I will discuss the complicated feature due to the non-unity fidelity of Raman pulses. I will also comment on the connection between our scheme and the Bragg atom optics. [1] G. Peng , B. Lanigan , R. Shah , J. Lim , A. Kaushik , J. P. Cotter , E. A. Hinds , and B. E. Sauer, Large momentum transfer Raman atom interferometer without k-reversal, Phys. Rev. Res. 7, L032045 (2025) [2] M. Jaffe, V. Xu, P. Haslinger, H. Mller, and P. Hamilton, Efficient adiabatic spin-dependent kicks in an atom interferometer, Phys. Rev. Lett. 121, 040402 (2018).

**Wednesday, March 18, 2026 12:30pm - 02:15pm**
Moonstone Bldg / Ground floor / Seminar Room G (I24.EG.030g)

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