

FWS19-2019-000055

Abstract for an Invited Paper  
for the FWS19 Meeting of  
the American Physical Society

**Atoms and molecules as quantum sensors<sup>1</sup>**

JONATHAN WEINSTEIN, University of Nevada, Reno

Ensembles of atoms and molecules can be used to make the world's most accurate clocks and sensors. These sensors can be used for practical applications, as well as for particle physics experiments and tests of the standard model. We will discuss how these sensors work, the transition from ensembles of atoms to single-atom quantum sensors, simple methods for improving quantum coherence, and future possible improvements with entangled atoms. We will also discuss our research using alkali atoms trapped in a crystal of solid hydrogen as quantum sensors.

<sup>1</sup>This material is based upon work supported by The National Science Foundation under Grants PHY 1607072 and PHY 1912425.