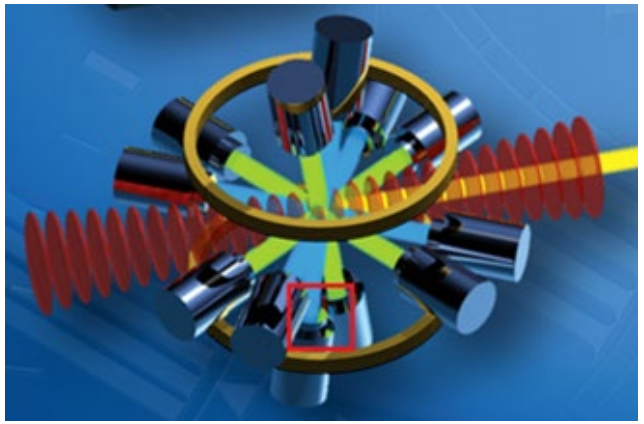
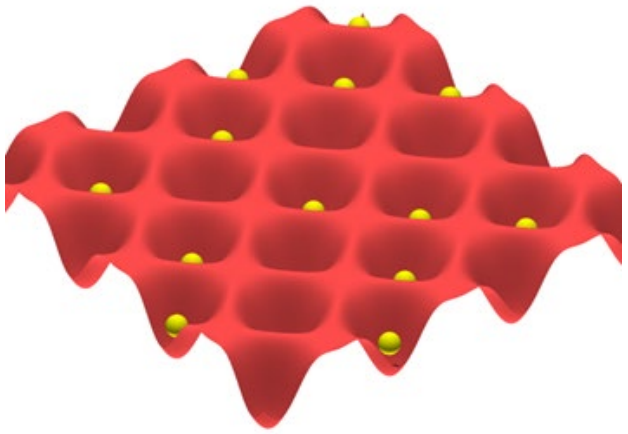
Optical atomic clocks (Andrew Ludlow, andrew.ludlow@nist.gov)



Our research focuses on the development of optical clocks with ultracold atoms. Using tightly-confined ytterbium in the idealized potential of a magic-wavelength optical lattice, the lattice clock probes the next frontier of atomic timekeeping. Our recent efforts seek to advance the optical lattice clock by implementing new quantum control techniques, extreme laser frequency stabilization, ultra-coherent atom-light interactions, and new quantum technologies for simplifying optical clocks. In addition to exploring the fundamental limits of optical clocks from atom-light interactions, our research also includes optical-clock-based searches for beyond-Standard-Model physics and new applications like gravitational sensing with clocks. More information on our research can also be found in a few articles listed below. Please feel free to reach out with any questions.



- **W. McGrew et al., "Atomic clock performance enabling geodesy below the centimeter level," Nature 564 87 (2018).**
- **Boulder Atomic Clock Optical Network Collaboration, "Frequency ratio measurements at 18-digit accuracy using an optical clock network," Nature 591, 564–569 (2021).**
- **X. Zhang et al., "Subrecoil Clock-Transition Laser Cooling Enabling Shallow Optical Lattice Clocks," Phys. Rev. Lett. 129 113202 (2022).**
- **J. Siegel et al., "Excited-Band Coherent Delocalization for Improved Optical Lattice Clock Performance," arXiv:2402.04968 (2024).**

Our labs are located at the National Institute of Standards and Technology, near the south side of CU campus. Please feel free to email any questions, or reach out to have more discussion. We have an RA opening in experimental AMO physics.