



# Atomic Lunar Seismometer

PI: Nan Yu/JPL

**Platform:** Lander deployment

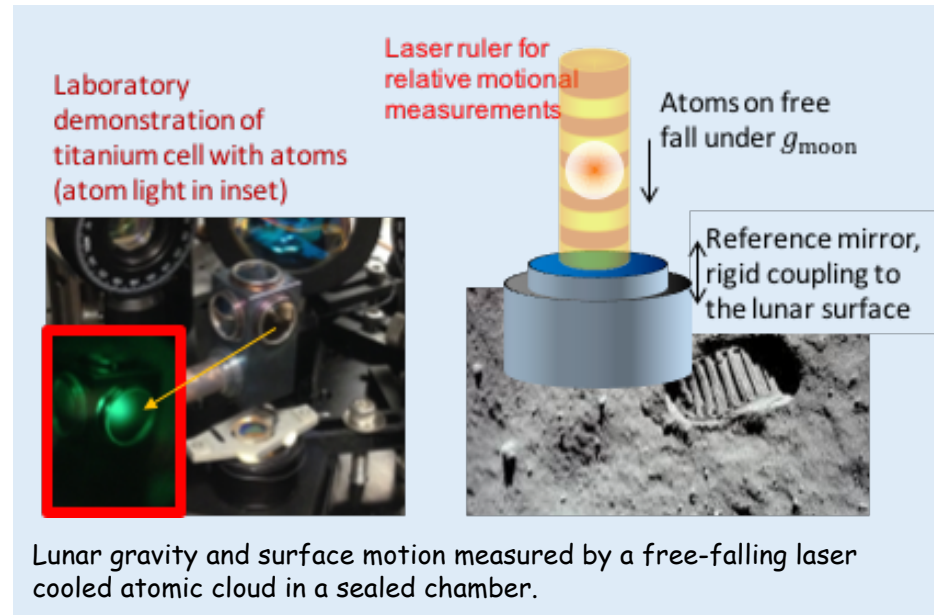
## Science:

- Study of deeper and overall lunar interior and structure by measuring seismic waves and long-period global normal modes from 10 mHz to 1 mHz
- Diagnoses of internal structure and core with simultaneous observation of gravity tides at the time scales of days and months
- Demonstration of long-period signal measurements on lunar surface for future more extensive network implementation.

## Objectives:

- Mature atomic lunar seismometer instrument concept to TRL6 for a lunar lander and future seismic network missions
- Demonstrate and validate acceleration vector sensitivities of  $3.5 \text{ nm/s}^2/\sqrt{\text{Hz}}$  seismetry and  $2 \text{ nm/s}^2/\sqrt{\text{Hz}}$  gravimetry on the Moon surfaces.
- Demonstrate long-term stability by measuring Earth gravity at the several-day timescale and comparing it with the known Earth tidal models.

**CoIs:** Sheng-wey Chiow, James Kohel, Ethan Elliott, Mark Panning (science), Bruce Bills (science), all from JPL



## Key Milestones:

- Year 1
  - Engineer design study and risk reduction complete
  - Parts procurements and vendor fabrications in process
- Year 2
  - Subsystems construction and testing complete
  - Electronics and software complete
- Year 3
  - Instrument brassboard integration and tests at TRL5
  - Environment tests with TRL6 verified

TRL 4 to 6