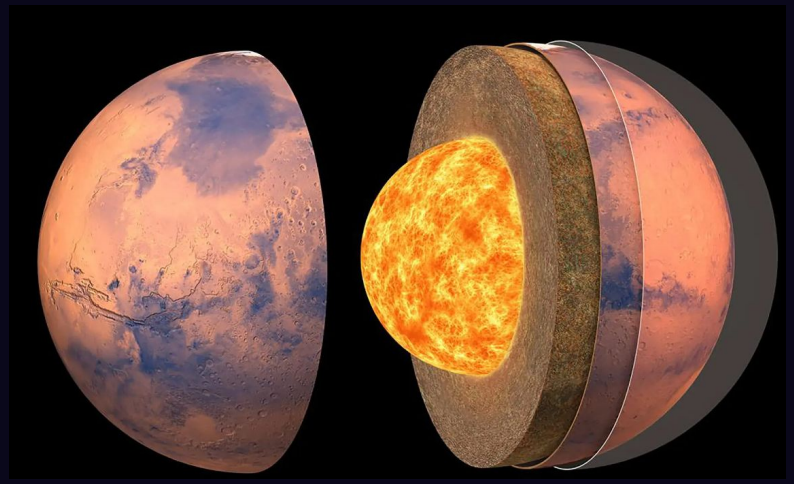
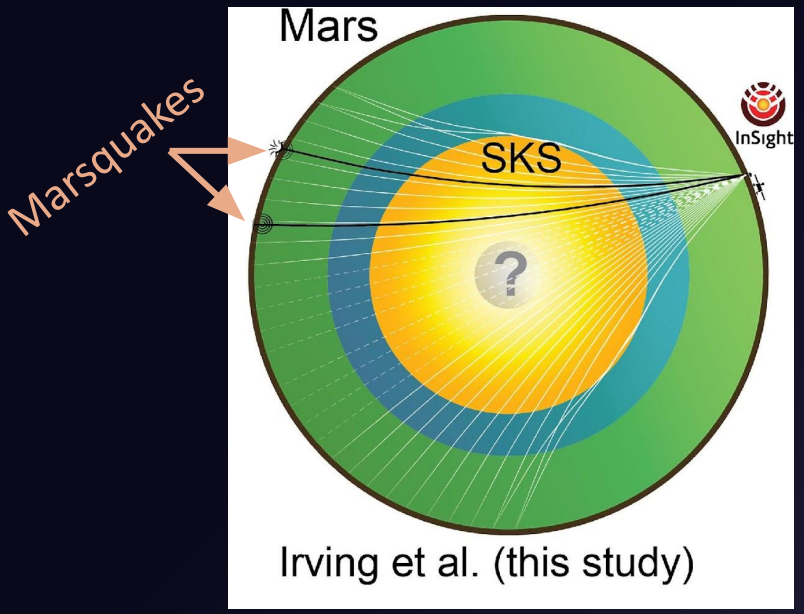
# First observation of seismic waves passing through the core of Mars






- A team of researchers set out to answer the question: “What is the size and composition of the martian core?”
- The team analyzed seismic signals from two marsquakes on the side of Mars opposite the InSight lander to identify waves that passed through the core. They then compared the travel times of these waves (i.e., the time required to travel from the marsquake epicenter to the seismometer) with those of waves taking different paths through the planet’s mantle to determine the seismic wave velocity in the core.
- These results indicate a somewhat smaller and denser core compared to previous estimates, leaving the researchers to infer that Mars’ core contains 20–22 wt% of light elements like sulfur, oxygen, carbon, and hydrogen.
- A precise determination of the light element budget of Mars’ core is vital in comparing the processes at play during the formation of the Earth and Mars. Such a comparison could reveal the extent to which differences between Earth and Mars are a consequence of the material which accreted to form the two planets and which are due to the physical conditions (e.g., pressure and temperature) present during planetary differentiation.

Irving et al. (2023) *PNAS*