Scientific Achievement
The structure of a new phase in the H₂+H₂O system ("C₀") was experimentally resolved using single-crystal X-ray diffraction.

Significance and Impact
The oxygen topology of this phase shows strong similarities with the mineral quartz, strengthening analogies between ice and silicate minerals. C₀ holds >5wt% H₂ in large channels that provide mobility.

Research Details
• Single crystals grown at 400 MPa and 280 K within diamond anvil cells and probed using Raman spectroscopy and single-crystal X-ray diffraction.

• Composition is (H₂O)₂H₂ with three formula units per unit cell. Chiral hexagonal structure, space group P6₅22.

(A) Supercell of the C₀ structure viewed down the crystallographic c-axis. H₂ molecules are shown in blue. (B) Single channel along the c-axis is a tube constructed of hydrogen-bonded water molecules with pentagonal tiling. (C) Tubes consist of interpenetrating spiral chains of H₂O and H₂.