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High-pressure thermal properties of liquid, crystalline, and amorphous H2O ZACHARY GEBALLE, VIKTOR STRUZHKIN, Carnegie Inst of Washington — We have developed a new technique to measure thermal conductivity and heat capacity of any insulator compressed inside a diamond anvil cell. The method uses Joule heating of a platinum foil or thin-film that is pressed against the sample. Electrical current oscillates at frequencies up to 300 kHz and we infer the amplitude of temperature oscillation via a third-harmonic voltage measurement. The melting and freezing of water in a diamond cell, including 30 K hysteresis, is documented with this new technique when temperature is varied over hours. We will also present calorimetry results using cooling timescales from seconds to milliseconds, which may be short enough to pass through "no-man's land" into the stability field of glassy water.

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