

Meet the scientists exploring when hydrogen stops moving like a gas and starts moving like a liquid

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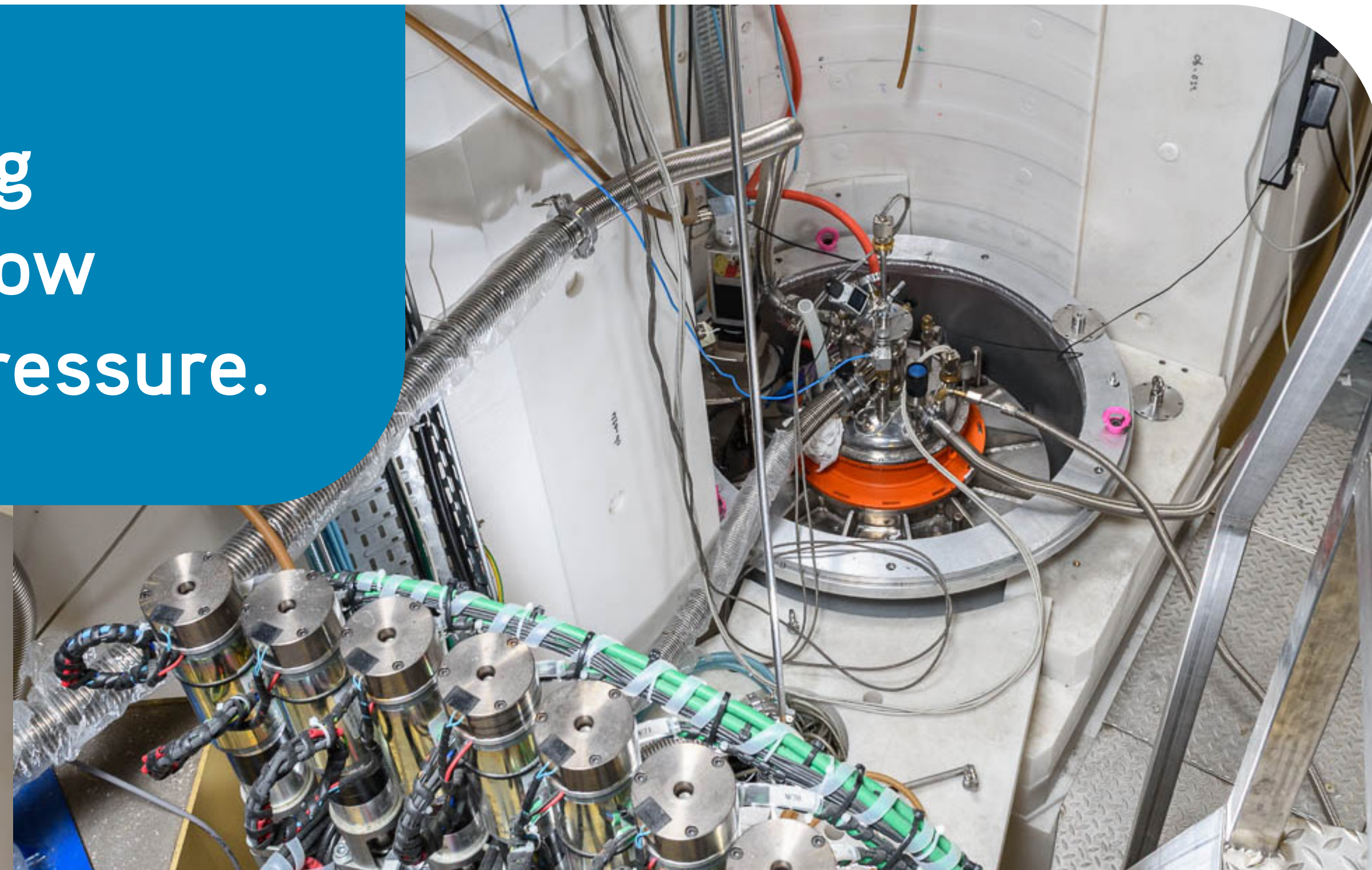
Simon Baudoin

Hydrogen is one of the simplest molecules in nature, but under extreme conditions its behaviour is far from simple.

When it is pushed beyond its critical point, it becomes **supercritical**: no longer clearly a gas, not quite a liquid, but something in between.



Using quasielastic neutron scattering on PANTHER, the team can follow how hydrogen molecules diffuse under pressure.



By measuring changes in the neutron signal, they can extract the self-diffusion coefficient and see how molecular motion evolves from gas-like to liquid-like behaviour.

“With cold neutrons on IN6, we observed a gas-like to liquid-like crossover in methane, a classical supercritical fluid.

Now, using thermal neutrons on PANTHER, we want to know whether the same picture holds for hydrogen, a supercritical quantum fluid, where quantum effects may give molecules additional ways to move.”

Maria Rescigno





By studying supercritical hydrogen, this experiment tests how quantum effects shape molecular diffusion in a state of matter that is neither gas nor liquid, yet important in both industrial processes and planetary systems.