SE-JRA: High Temperature

Aerodynamic levitation

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Containerless Furnaces

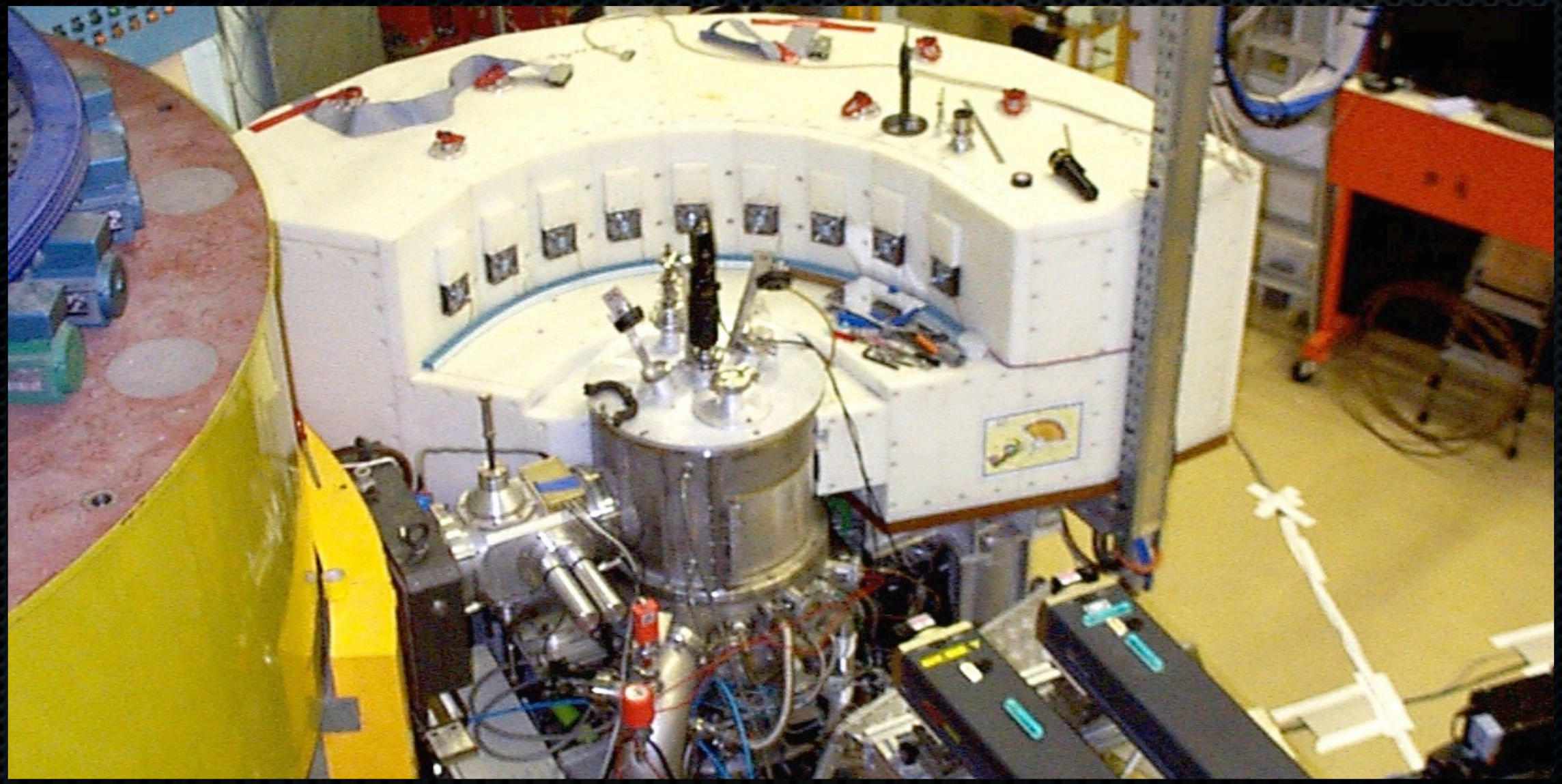
- Motivation ?
  - Why liquids may not solidify below their normal freezing point (supercooling) ?
  - The molecular processes by which liquids acquire amorphous rigidity upon cooling are not understood
  - Can we improve glass blowing, crystal growth, food processing, preservation of life ?

Credits: J. Cusack – EMBL

Supercooled pure water…

Why water does not freeze in clouds ?

T. U. Schülli, R. Daudin, G. Renaud, A. Vaysset, O. Geaymond & A. Pasturel, *Nature* **464** (2010) 1174



Vitreous $(CaO)_x$-$(Al_2O_3)_{1-x}$

Good mechanical properties and high transparency in the mid-infrared range up to 6µm (D4 - T > 1900K)

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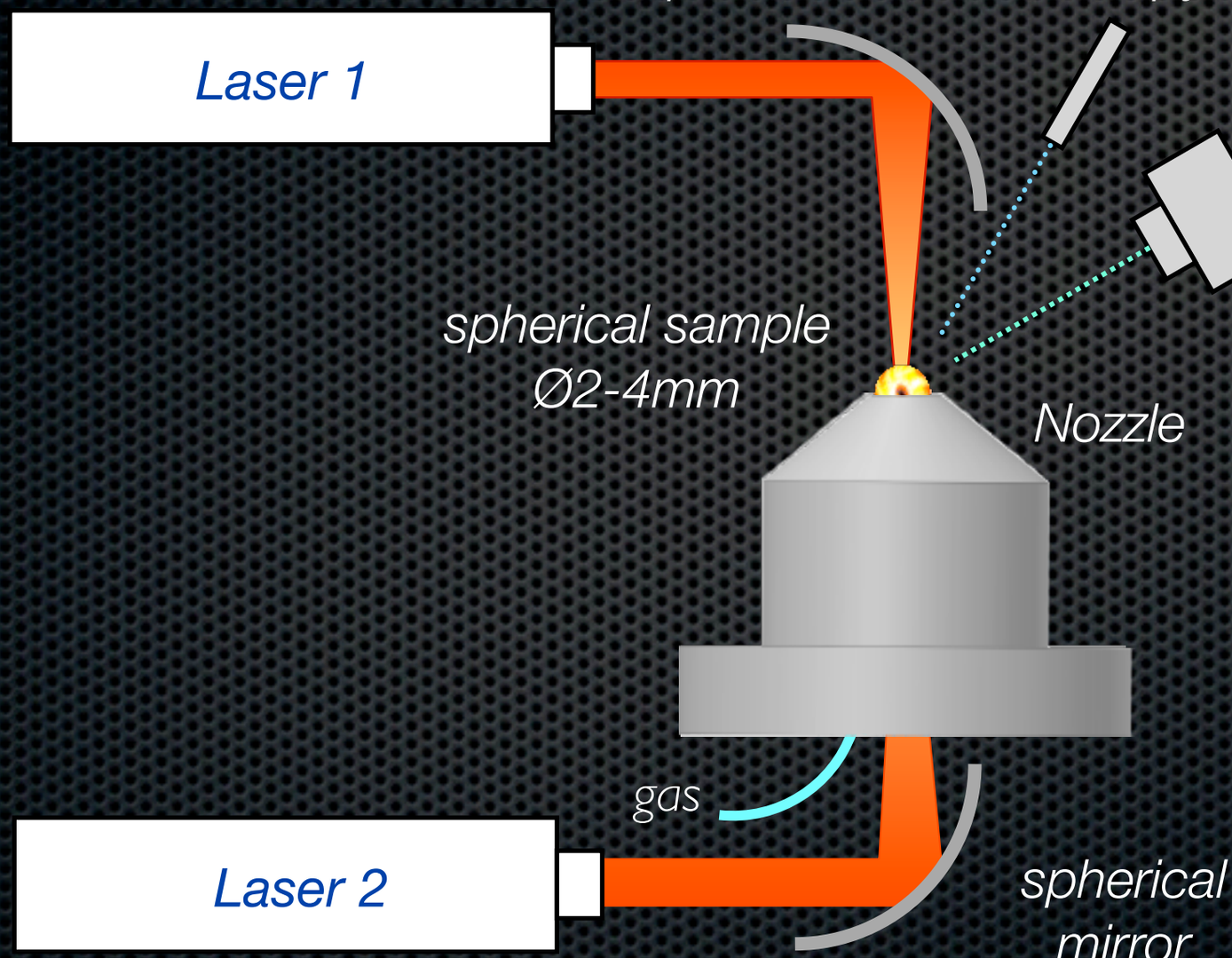
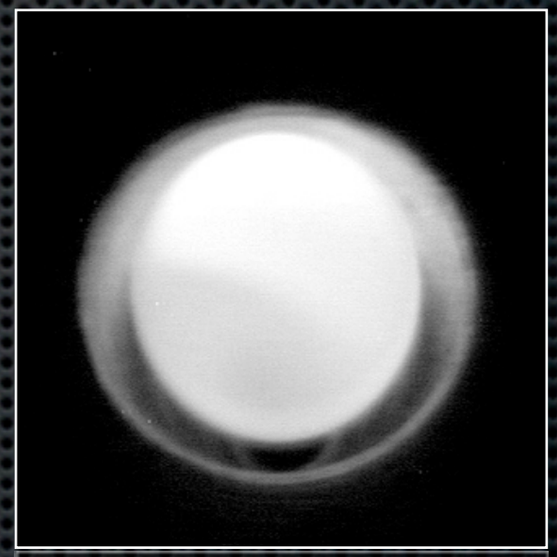
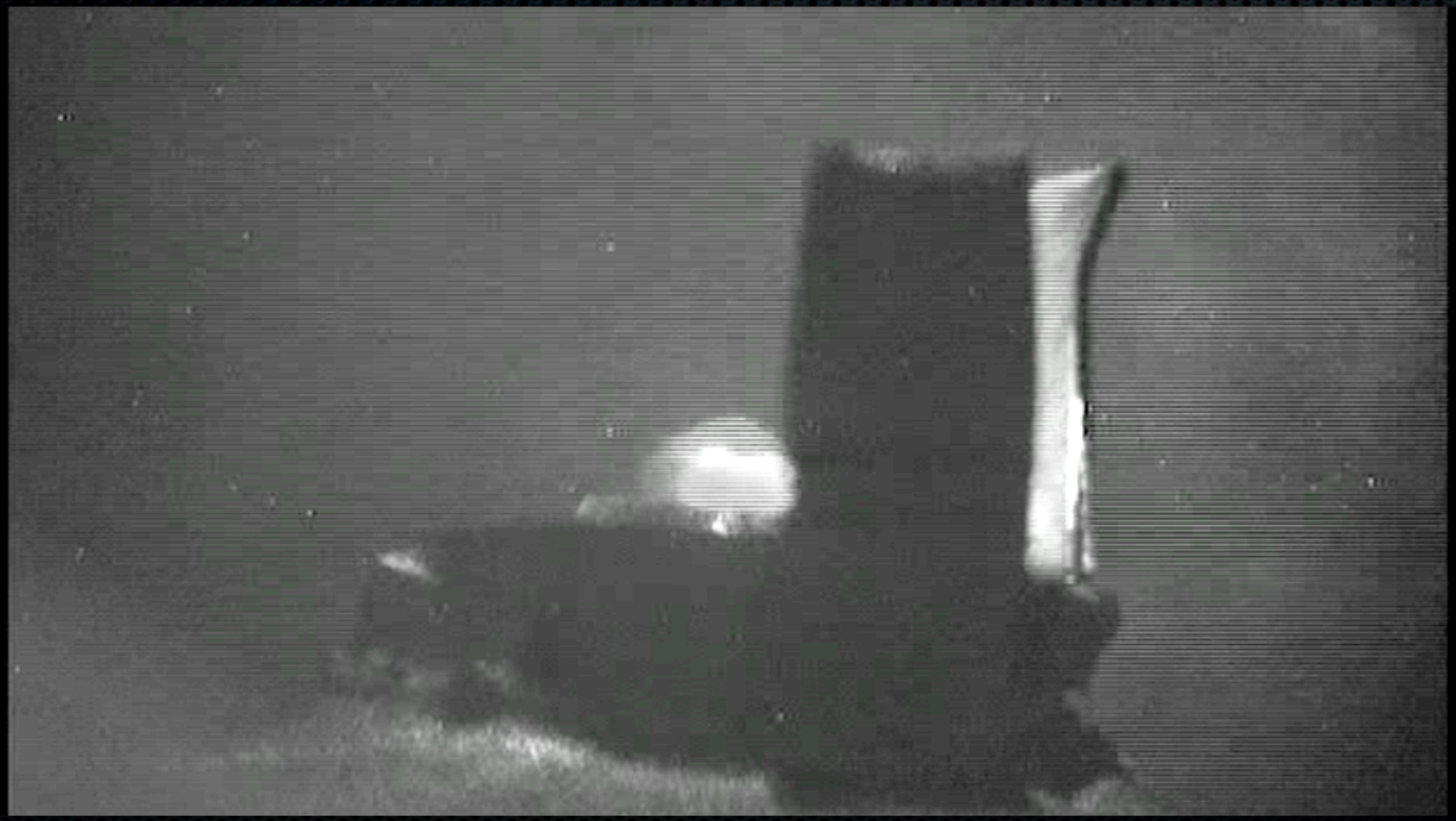




- 300 to 3000 K
- Ø2-4 mm sample
- ⅔ sample in beam
- polarised neutrons



Aerodynamic levitation

Standard technique (video recorded on IN22)

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- New technique for neutron scattering…

1. Brainstorming meetings
2. Trials at CEMHTI (CNRS - Orléans)
3. Construction of a test rig using different nozzles geometries, different gases and several samples (3 sizes: Ø2, Ø4 and Ø6mm, 3 densities: Aluminium, stainless steel, lead).

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