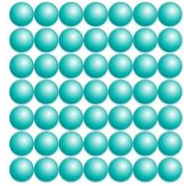


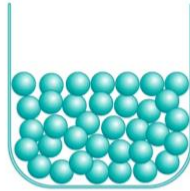
Laser Light Scattering in Complex Fluids

Our understanding of gases and crystals are quite mature, but the physics of liquids remains a major challenge. Particularly challenging are highly viscous liquids near the threshold for solidification whose slowing molecular motions become increasingly more complex as transition into a glass takes place.



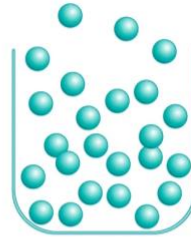
Solid

The molecules that make up a solid are arranged in regular, repeating patterns. They are held firmly in place but can vibrate within a limited area.



Liquid

The molecules that make up a liquid flow easily around one another. They are kept from flying apart by attractive forces between them. Liquids assume the shape of their containers.



Gas

The molecules that make up a gas fly in all directions at great speeds. They are so far apart that the attractive forces between them are insignificant.

Image: Encyclopedia Britannica

In the **Glass Dynamics Lab**, we employ **photon correlation spectroscopy (PCS)** as a primary means to investigate the nature of slow molecular motions in a variety of primarily inorganic glass-forming liquids. Research activities include working with high temperature furnaces to produce high quality glass samples, using laser spectroscopy to study these glasses in the molten state and developing models to interpret the findings.

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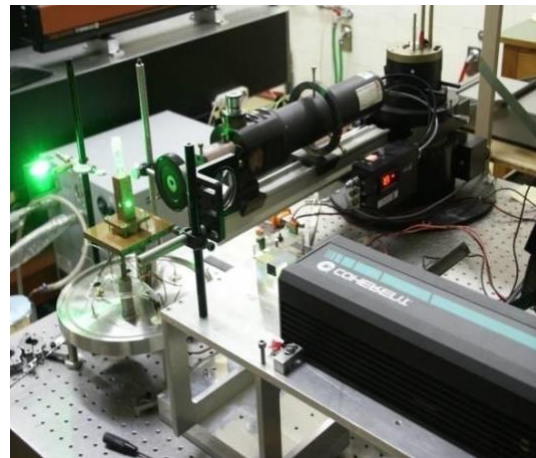


Image: <https://www.old.iom.cnr.it/>

Recent publications:

D. L. Sidebottom, "Generic α -relaxation in a strong GeO₂ glass melt" *Phys. Rev. E* **107**, L012602 (2023).

G. Dirks, J. Pereira and D. L. Sidebottom, "Dynamic light scattering in low connectivity phosphate glass melts crosslinked by Na or Zn" *J. Non-Cryst. Sol.* **X 17**, 100157 (2023).

H. Uppala and D. L. Sidebottom, "Evidence for ionic diffusion in dynamic light scattering from glass-forming sodium borate melts" *J. Non-Cryst. Sol.* **588**, 121627 (2022).