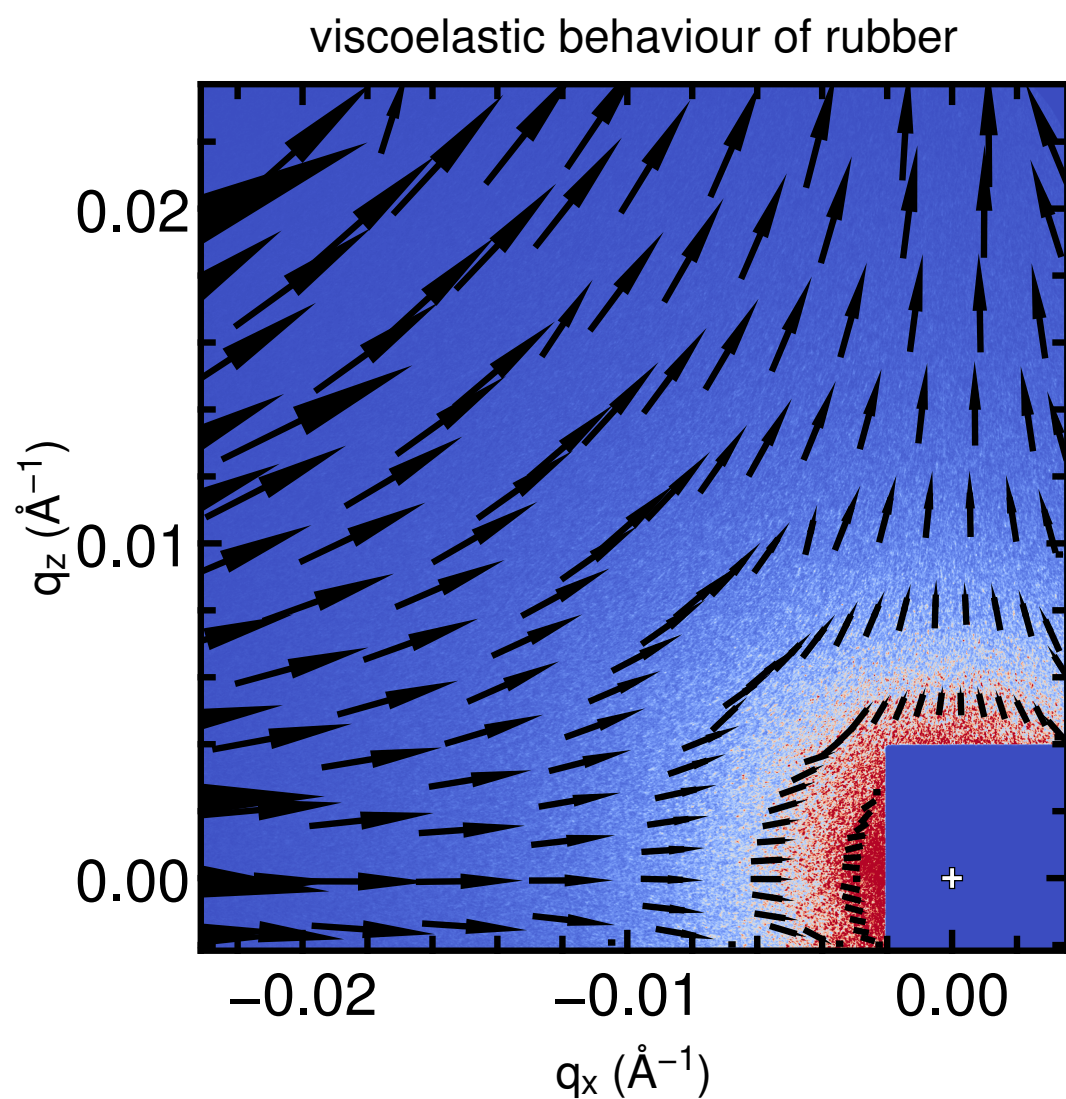


# Mark Sutton

## X-ray Photon Correlation Spectroscopy: Past, Present, and Future

Fluctuations, Brownian motion or thermal noise is where materials store thermal energy. Fluctuations are how materials stay in equilibrium or change in response to external changing conditions. X-ray photon correlation spectroscopy (XPCS) is a technique that uses the coherence properties of x-rays to give detailed information about fluctuations and their dynamics at nanometer length scales, both in equilibrium and non-equilibrium systems. After discussing the basis of the technique, this talk will discuss three aspects of XPCS. First, some of the interesting results obtained to date; second, the current status and limitations of XPCS; and finally, the exciting new capabilities opened up by new sources such as the APS Upgrade and x-ray free-electron lasers.



**Mark Sutton** is a James McGill Professor of Physics at McGill University. His studies concentrate on equilibrium and non-equilibrium dynamics of systems of interest to materials science. Most recently, he has been employing the ability to perform x-ray photon correlation spectroscopy using coherent x-ray beams. This technique exploits the unique properties of the coherent radiation at third-generation synchrotron sources and recent developments in x-ray optics and detector technology. He is a fellow of the Royal Society of Canada and a member of the Canadian Association of Physics. He has been awarded the Compton Medal from the Advanced Photon Source and the Brockhouse Medal and the Medal for Lifetime Achievement in Physics from the Canadian Association of Physicists.

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