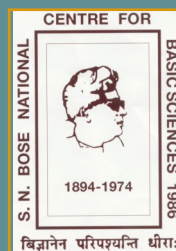




# Institute Colloquium



**S. N. Bose National Centre for Basic Sciences**  
(An Autonomous Research Institute established under DST, GOI)



**10 April, 2023**



**4 PM**  
at FERMION, SNBNCBS



**Webinar Link**

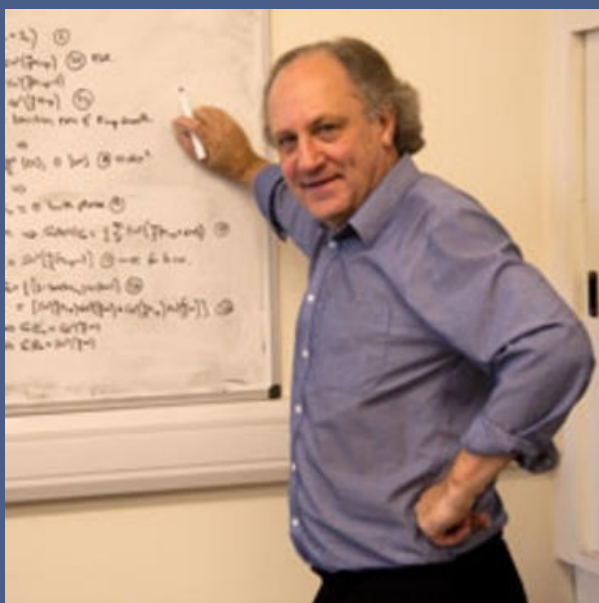
**YouTube YouTube Link**

## *Title:*

**Many-body localisation, multifractality and all that: a Fock-space perspective**

## *Abstract:*

Many-body localisation (MBL) driven by disorder in quantum many-body systems has attracted great interest in recent years, in part because the existence of an MBL phase represents a fundamental breakdown of the ergodic hypothesis which underpins equilibrium statistical mechanics. Since the phenomenon is a many-body one, a natural framework within which to understand it is the underlying Fock space, the random network or 'lattice' on which MBL occurs. With this perspective, MBL can be viewed as an unconventional Anderson localisation problem on the complex, correlated Fock-space graph of the quantum many-body system. The talk aims to give a general introduction to MBL from this point of view (including deciphering the words above); together with vignettes of some obviously occurring questions, such as the character of MBL eigenstates and the nature of the MBL transition.



## *Speaker:*

**Professor David Logan**

Coulson Professor of Theoretical Chemistry, University of Oxford and Infosys Visiting Chair at the Indian Institute of Science, Bengaluru

## *Short biography of the Speaker*

Prof. David Logan has been Coulson Professor of Theoretical Chemistry since 2005, having joined the Oxford faculty in 1986 for his first position as a University Lecturer. He recently co-founded and was the first Director of the TMCS Centre for Doctoral Training. Prof. Logan's research interests centre on quantum many-body theory and statistical mechanics, and includes theories of both strongly interacting as well as disordered systems; most recently in the area of many-body localisation. He has strong collaborative links with the Condensed Matter Theory Group in Oxford Theoretical Physics. He also has longstanding scientific connections to India, currently holding an Infosys Visiting Chair at the Indian Institute of Science, Bengaluru; and is a Foreign Fellow of the National Academy of Sciences, India. His work has been recognised by the RSC through the awards of the Marlow Medal, Corday-Morgan Medal and the Tilden Medal.