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## In Search of Simple Dynamical Models in Complex Systems: From Binary Mixtures to Electrolyte Conduction and Biological Water

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Path breaking works by Raman and Mizushima on vibrational spectroscopy have laid the foundation of many subsequent significant discoveries in different areas of physics, chemistry and biology. Professor Mizushima's discovery of rotational isomerism is an apt example of the use of Raman spectroscopy in discovering simplicity in complex situations. During the last decade, increasing number of noteworthy applications of time domain Raman and other forms of ultrafast spectroscopic techniques have been made in understanding complex chemical systems, ranging from vibrational relaxation in binary mixtures to the dynamics of water in biological systems. In this lecture, I shall discuss construction of simple models to understand several such complex systems, much in the spirit of Raman and Mizushima. I shall address anomalous vibrational phase relaxation (Raman line width) near the gas-liquid critical point and also in binary mixtures, ionic mobility in electrolyte solutions and the curious dynamics of water in the hydration layers of proteins and DNA.