



## Preface



This issue of the *Journal of Non-Crystalline Solids*, dedicated to Dr Kia L. Ngai, consists of selected papers from a symposium in his honor, organized by Dino Leporini of the Università di Pisa and Mario Tosi of the Scuola Normale Superiore, which took place on September 16, 2006 in Pisa, Italy.

Kia Ngai was born in Canton, China and received a PhD in 1969 from the University of Chicago, working with Morrel H. Cohen on Josephson junctions and the physics of surface plasmon. After two years at the MIT Lincoln Laboratory, he moved to NRL to become a section head in the Semiconductors Branch. During this time he was engaged in research of electron physics using quantum mechanical methods to treat many-body problems. In 1978, he attended a lecture given by Andrew Jonscher on dielectric relaxation of non-electronic materials, a subject totally foreign to him. After the talk, he concluded that many-body dynamics are the key to understand relaxation and diffusion of densely packed and mutually interacting units, such as molecular glass-forming liquids and other systems. He constructed a model, which at the invitation of the editor, Roman Smoluchowski, was first published in *Comments Solid State Physics* 9 (1979) 127, and then together with Jonscher and C.T. White in *Nature* 277 (1979) 185. The model addressed semi classically quantized interacting systems, which have a Gaussian orthogonal distribution of their energy level spacing. In classical mechanics, many systems with anharmonic interactions are chaotic and when semi classically quantized have the Gaussian orthogonal distribution. Recognizing this correspondence, subsequently he constructed a model of classical mechanics with essentially the same result [*Physics Review E* 60 (1999) 4512]; this analysis is now known in the literature as the coupling model. From the outset, the model yielded predictions generally applicable to different aspects of relaxation and diffusion. Although he was initially an outsider in many of these areas, the accuracy of his model's predictions enabled him to quickly make a substantial impact. His association with experts in different areas, such as Professor Donald J. Plazek in the viscoelasticity of polymers, aided his development. Thus, he changed the direction of his scientific career to focus on relaxation phenomena in condensed matter.

Over the past 27 years, Kia Ngai's research activities have involved collaboration with many colleagues, particularly experimentalists, in various institutions around the world. This reflects the broad applicability of the coupling model and its ability to make definitive predictions. The model has been applied to many different fields including the glass transition, polymer viscoelasticity, ionically conducting materials, colloids, metallurgy, and water and its mixtures. He authored a chapter in the textbook *Physical Properties of Polymers* (3rd ed., Cambridge University Press) and coauthored a recent review in *Advances in Chemical Physics* 133 (2006) 497. He has more than 370 archival publications and an H-index of 57.

Kia Ngai is well known for his workshops on "Relaxations in Complex Systems", organized beginning in 1983 in Blacksburg, Virginia, and subsequently in Heraklion, Crete, Greece (1990), Alicante, Spain (1993), Vigo, Spain (1997), Hersonnisos, Crete, Greece (2001), and Lille, France (2005). These international meetings have brought together researchers from various fields, and have been especially beneficial in the development of collaborative research activities. Ngai edited the proceedings of these meetings, published in the *Journal of Non-Crystalline Solids*.

Kia Ngai has received the Navy Superior Civilian Service Award and the Sigma Xi Pure Science Award, and has been a visiting Professor at the University of Münster, the University of Konstanz, the Max Planck Institut für Polymerforschung and für Physik Komplexer Systeme, the Tokyo Institute of Technology, the University of Lille, Osaka University, and the University of Pisa.

He presently resides in Great Falls, VA with his wife Linsen; they have three daughters, Sianne, Seagan, and Serin.

*Guest Editor*  
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