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# 凝聚态物理-北京大学论坛

## 2009年第15期

## Femto/Pico-second coherent four-wave mixing spectroscopies

## Dr. W. Kiefer

**时间：10月15日（星期四）15:00—16:40**

**地点：北京大学物理大楼中212教室**

**Dr. W. Kiefer**, Professor, Institute for Physical Chemistry, University of Würzburg, Germany; Editor-in-Chief, Journal of Raman Spectroscopy. Wolfgang Kiefer is a retired Professor from University of Würzburg, Germany. He worked in the field of linear and non-linear Raman spectroscopy for over 40 years. He has close to 800 publications and he is co-author of several books. He had been Physics Professor at the Universities of Bayreuth (1977-1985), Germany, and Graz (1985-1988), Austria, before he became Professor of Physical Chemistry at the University of Würzburg (1988-2006). He has received many international awards among them the Pittsburgh Spectroscopy Award (2006), USA, and the first International Raman Award (2008), India. He is Fellow, Honorary Fellow and Honorary Member of several International Societies. He had been and still is board member of several international journals (among them the Chinese Journal of Light Scattering) and he is currently the Editor-in-Chief of the international Journal of Raman Spectroscopy.

His relations to China are widespread: he is Honorary Professor of the Wuhan University and the Capital Normal University Beijing where he is also Academic Committee Member; he was Visiting and Guest Professor of several Chinese Universities and he had been invited many times to the biannual Chinese Light Scattering Conferences; he had also been appointed as a member of the International Advisory Group of the Committee of Light Scattering, Chinese Physical Society (2003–2007).

**Abstract**: **(i) To give an introduction to the various femto-/pico-second coherent four-wave-mixing spectroscopy techniques where mainly Raman processes are involved. (ii) To show and summarize the state-of-the-art of these and other nonlinear coherent techniques. New developments in the nonlinear coherent Raman field will be reviewed and discussed in general terms. One of the major topics certainly is CARS microscopy which has matured from the proof-of-principle technique to a widespread imaging method in the fields of biology, physics, chemistry, material science, and others. Also, femtosecond stimulated Raman microscopy (FSRM), Tip-Enhanced CARS microscopy (TE-CARS), and femtosecond broadband Raman-induced Kerr effect spectroscopy (FRIKES) will be discussed. The lecture is well suited for graduate students in physics and chemistry since the basic principles of these non-linear coherent techniques will be explained in great detail. It also emphasizes the advantages over conventional Raman microscopy.**

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*Photograph by Xiaodong Hu*