黄昆半导体科学技术论坛

 **第347期讲座**

**报告题目:** **Linear Raman and Coherent Anti-Stokes Raman Spectroscopy of II-VI Semiconductor Quantum Dots**

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**Abstract**: Quantum dots are ideal systems for investigating the physics of quantum confinement. In this talk I will first discuss linear resonance Raman spectroscopy of a variety of CdSxSe1-x doped glasses with band gap energies ranging from about 1.75 to 2.5 eV in order to determine the composition and the average size of these semiconductor nano-crystallites. By means of low-wavenumber Raman spectroscopy the acoustical phonons from the CdSxSe1-x quantum dots were investigated for in- and off-resonance conditions. The size-dependence of the longitudinal optical (LO) wavenumbers and the dependence of the band gap energy on the quantum confinement effect and the composition will be discussed.

Then, nonlinear Raman spectra recorded by means of resonance Coherent Anti-Stokes Raman Scattering (CARS) spectroscopy applying nanosecond pulses are presented. Here, the temperature dependence and the related changes in the electronic resonance conditions are described.

Finally, by means of femtosecond time-resolved CARS the study of the relaxation dynamics of coherent LO phonons in the above-mentioned quantum dots are reported. The energy relaxation time (T1) as well as the phase relaxation time (T2) could be derived from these measurements to be 1.8 ps and 1.3 ps, respectively.

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**Wolfgang Kiefer** had been Associated Professor of Experimental Physics at the University of Bayreuth, Germany, from 1977-1985 and Full Professor for Experimental Physics at the University of Graz, Austria from 1985-1988. He then accepted a chair in Physical Chemistry at University of Würzburg where he stayed until his retirement in 2006. He has been and still is member of several scientific journals, and he had been Editor-in-Chief of the Journal of Raman Spectroscopy from 2000 to 2009. His research interests are mainly concerned with several aspects of Raman spectroscopy ranging from the development of new techniques, resonance Raman and surface enhanced Raman spectroscopy, Raman/Mie scattering, to non-linear Raman spectroscopies with femtosecond lasers. He has published about 900 papers. He is Honorary Professor and Honorary Doctor of several international Universities. He also received many awards, among them the prestigious Pittsburgh Spectroscopy Award and the first Raman Lifetime Award provided by the International Conferences on Raman Spectroscopy. He is member and Honorary Member of several Scientific Societies. After his retirement in 2006, he has set-up a Raman laboratory in the basement of his home*.*

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