ELECTRONIC SPECTRA OF CARBON CHAINS: RELEVANCE TO ASTROPHYSICS AND NANOSCIENCE

JOHN P. MAIER, *Department of Chemistry, University of Basel,*
Klingelbergstrasse 80, CH-4056, Basel, Switzerland.

The electronic spectra of neutral carbon chains, their cations and anions are being obtained in the gas phase in low temperature beams. A number of sensitive techniques are used concurrently: frequency modulation absorption spectroscopy, two photon ionization techniques and cavity ring-down spectroscopy, in combination with supersonic discharge sources. The gas phase spectra obtained in the laboratory have enabled, for the first time, a direct comparison with astronomical measurements in the diffuse medium for polyatomic carbon chains to be made. The implications of this and the directions for future studies are discussed. It is shown that the understanding and pattern of the electronic spectra for such systems are
relevant also for nanoscience; for example the electrical properties of such nanowires can be predicted.