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Spectral characteristics of cryogenic carbon nanotubes

# Professor Alexander Hoegele

Faculty of Physics  
Ludwig-Maximilians-Universität München

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Pristine semiconducting carbon nanotubes are commonly pictured as one-dimensional solid-state systems that host diffusive excitons at room temperature. At cryogenic conditions, however, the photophysics of carbon nanotubes are dominated by exciton localization stemming from accidental disorder or deterministic covalent side-wall functionalization. On the basis of our photoluminescence studies of individual carbon nanotubes at low temperatures I will discuss the spectral signatures of exciton localization and highlight the effect of the dielectric environment on the spectral characteristics of single nanotube emission.

