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Ph.D., University of Hamburg, Germany

- Chemistry and physics of colloidal inorganic nanomaterials.
- Design of functional materials through guided self-assembly of nanoscale building blocks.
- Charge, heat and energy transport in nanocrystal-based materials.
- Utilization of semiconductor nanocrystals in electronics, thermoelectric and photovoltaics. Solution-processed inorganic semiconductors.

Selected publications from a total of 150 papers, 8 patents

1. W. Liu, J.-S. Lee, D. V. Talapin. III-V nanocrystals capped with molecular metal chalcogenide ligands: high electron mobility and bipolar photoresponse. *J. Am. Chem. Soc.* **135**, 1349 (2013)
2. A. Nag, D. S. Chung, D. S. Dolzhnikov, N. M. Dimitrijevic, S. Chattopadhyay, T. Shibata, D. V. Talapin. The effect of metal ions on photoluminescence, charge transport, magnetic and catalytic properties of all-inorganic colloidal nanocrystals and nanocrystal solids. *J. Am. Chem. Soc.* **134**, 13604 (2012).
3. J.-S. Lee, M. V. Kovalenko, J. Huang, D. V. Talapin. Band-like Transport, High Electron Mobility and High Photoconductivity in All-inorganic Nanocrystal Arrays. *Nature Nanotech.* **6**, 348 (2011).
4. M. V. Kovalenko, M. Scheele, D. V. Talapin. Colloidal Nanocrystals with Molecular Metal Chalcogenide Surface Ligands. *Science* **324**, 1417 (2009).
5. D. V. Talapin, E. V. Shevchenko, M. I. Bodnarchuk, X. Ye, J. Chen, C. B. Murray. Quasicrystalline order in self-assembled binary nanoparticle superlattices. *Nature* **461**, 964 (2009).
6. M. I. Bodnarchuk, M. V. Kovalenko, W. Heiss, D. V. Talapin. Energetic and Entropic Contributions to Self-assembly of Binary Nanocrystal Superlattices: Temperature as the Structure-directing Factor. *J. Am. Chem. Soc.*, **132**, 11967 (2010).