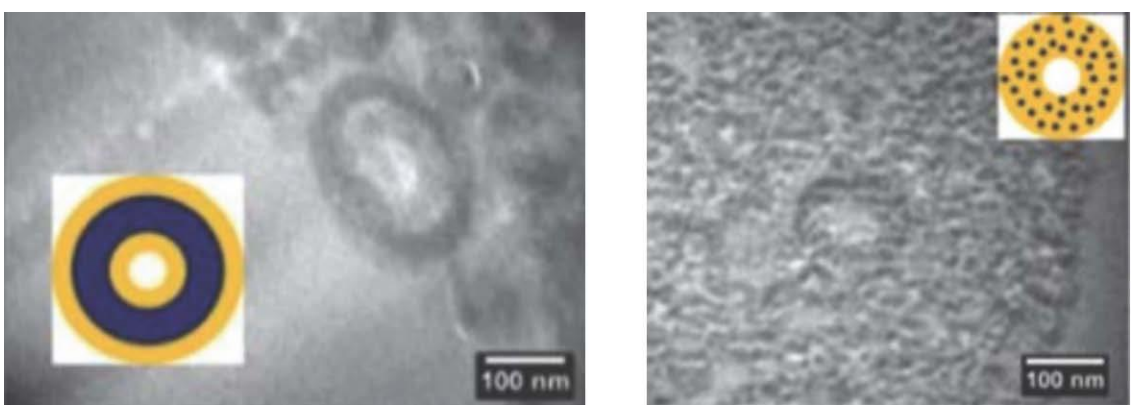
Block copolymer self-assembly under double spherical (shell) nano-confinement

A relatively new, but conceptually simple experimental procedure makes it possible to form spherically confined nano-particles out of block copolymers by a clever evaporation of mixed good and bad solvent for the polymers. A new simulation setup allows to simulate such spherically confined systems of arbitrary mixtures of block copolymers which reproduce existing experimental results for diblock copolymers. In this project the idea is to investigate the effect of such confinement when the polymers at the same time are restricted to move on an inner sphere which could either be a metal nanoparticle or a liquid core (see reference).

If this is a Master project there is a possibility to expand the project experimentally.

<u>As a student you will:</u>

✓ expand a currently running simulation setup to double confinent ✓ invent new relevant computational analysis methods? ✓ learn about



polymer physics/chemistry and complex self-assembly

<u>Figure:</u> Liquid core nanoparticles formed from PS-PMMA diblock copolymers in hexadecane.

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<u>Reference:</u> Staff *et al.*, Soft Matter, 2011, 7, 10219