

Fundamental Order of Transitions Revealed in Micelles

Scientific Achievement

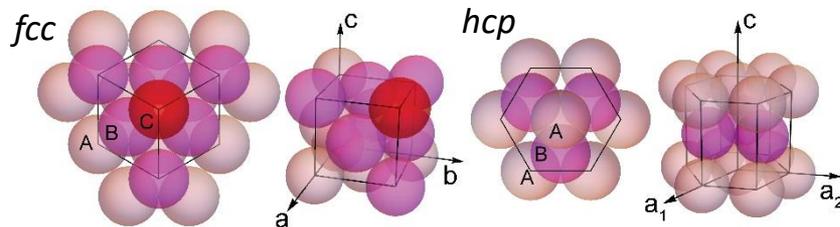
Scientists revealed the fundamental order of transitions of spherical packing structures using self-assembling block copolymer micelles.

Significance and Impact

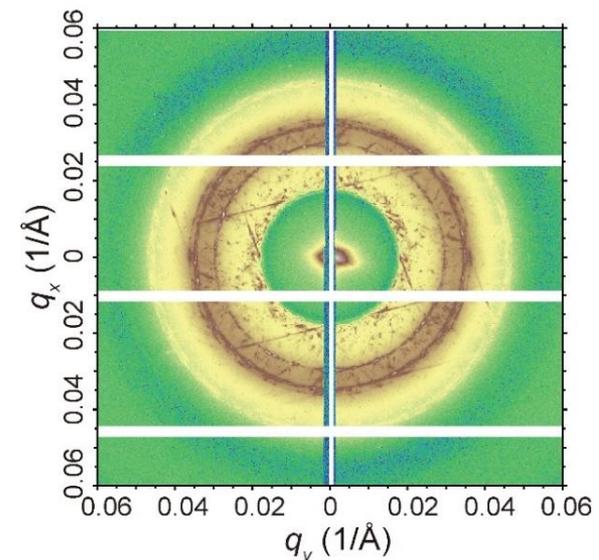
Close-packed structures of spheres are ubiquitous fundamental structures across diverse material systems; this research finds the origin of different close-packed structures.

Research Details

- Small-angle x-ray scattering at the CMS and SMI beamlines at NSLS-II was used to observe changes in packing structures of spherical micelles, illustrating how material structures behave in nature.



The brown diffraction spots, circles, and lines in the top image obtained from a block copolymer micelle solution by X-ray scattering indicate an unusual co-existence of fcc, hcp, and fcc-hcp mixed packing structures in the solution. The packing structures are illustrated in the lower panel.



L. Chen, H. S. Lee, S. Lee. *PNAS*, **115** (28), 7218-7223 (2018).

Work was performed at Brookhaven National Laboratory