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Semiconductor quantum rods (QRs) are highly promising novel materials that are poised to make a tremendous technological impact in everything from white-light lasers, to biological tags, to solar cells. Recently, a research team led by Professor Todd Krauss from the University of Rochester made the unexpected discovery that some CdSe QRs have a permanent surface charge. The charge arises due to imperfections in the rod synthesis and can leave a QR negative or positive, or neutral.

This finding is significant because a charged nanoparticle will have optical and electronic properties significantly inferior to one without charges. Thus, the unavoidable presence of charges on QRs could pose serious problems for the realization of their potential.