

## HKIAS Distinguished Lecture Series on Physics

# Tuning of Confined Quantum States

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Time : 3:00 pm - 4:30 pm

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## Abstract

The behaviours of quantum states of electrons, excitons and phonons in solids have long been known. However, when the size of solids is at nanometer scale, existing solid state theories often cannot be applied, calling for the establishment of low-dimensional physics theory. With this opportunity, I will present our work conducted over the years on the property changes of quantum confined states (including electrons, excitons, and phonons) due to environment changes and applications of stress, pressure and light. We demonstrated that the surface effects of semiconductor nanostructures are as important as quantum confinement and size effects. We expect that our researches can help develop low-dimensional physics.

## Biography

Ruiqin Zhang studied physics for his BSc and MSc and did Ph.D in Physical Chemistry at Shandong University. Before joining in the City University of Hong Kong, he had been in his visiting stays in the Hebrew University of Jerusalem and the University of Barcelona. His research interests include computational method developments and modeling and simulations with experimental confirmations of systems in condensed matter physics, surface science, chemistry, materials science, etc., aiming at revealing their formation/growth/reaction mechanisms, microstructures and novel properties. His proposals of using surface and stress/strain to engineer the electronic structure of low-dimensional systems are widely used in design and prediction of novel properties of functional materials in the scientific communities. He was one of the 10 recipients of the Friedrich Wilhelm Bessel Research Award by the Alexander von Humboldt Foundation of Germany in 2004. He was honored with three other national awards including the State Natural Science Award of China. And he served as the President of the Physical Society of Hong Kong in 2013-2017 and is currently Council Member of the Association of Asia Pacific Physical Societies (AAPPS). He was elected a Fellow of American Physical Society (APS) in 2018.

