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Computational Chemistry Bi-Weekly Seminar Series

# See the Nano with Light



**SPEAKER:** Yi Luo, University of Science and Technology of China

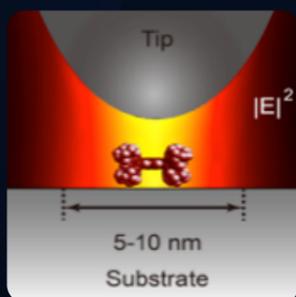
**TIME:** 2:00pm-3:00pm, Wednesday, March 13, 2019

**VENUE:** Room 264, Geography Building, Zhongbei Campus, ECNU

**HOST:** Xiao He, East China Normal University

## ABSTRACT OF THE TALK

Due to diffraction limit, the optical resolution of a far field light is less than a half of its wavelength, which makes it virtually impossible to “see” subject at the nanoscale. The use of a metallic nanocavity can generate spatially highly confined plasmon with intense field of broad energy distribution. It can break the diffraction limit to visualize a single molecule in real space with the light<sup>[1]</sup>. Many fascinating properties of the nanocavity plasmon (NCP) have also been found, resulting the plasmonic enhanced stimulating emission<sup>[2]</sup>, coherent energy transfer<sup>[3]</sup>, plasmon induced nonlinear electron scattering<sup>[4]</sup> and super-high resolution Raman images of single molecules<sup>[5]</sup>. A new theory that describes the interaction between the localized light and the molecule has been developed<sup>[6]</sup>, which helps to understand the experimental observations and provides also exciting new predictions.



### References:

- 1.R. Zhang, et al. *Nature*, 498 (2013) 82
- 2.Z.C. Dong, et al. *Nature Photonics*, 4 (2010) 50
- 3.Y. Zhang, et al., *Nature*, 531 (2016) 623; Y. Zhang, et al. *Nature Commun.* 8 (2017) 15225
- 4.C.K. Xu, et al. *Nature Physics*, 10 (2014) 753
- 5.S. Jiang, et al. *Nature Nanotechnology*, 10, (2015) 865; R. Zhang, et al. *Angew. Chem. Int. Ed.* 56(2017) 5561
- 6.G.J. Tian, et al., *Phys. Rev. Lett.*, 106 (2011) 177401; G.J. Tian, et al., *Angew. Chem. Int. Ed.*, 52(2013) 4814; S. Duan, et al., *J. Am. Chem. Soc.*, 137 (2015) 9515; S. Duan, et al., *Angew. Chem. Int. Ed.*, 128 (2016) 1053; S. Duan, et al., to be published.

## BIOGRAPHY

Professor Yi Luo is currently the Director of Hefei National Laboratory for Physical Sciences at the Microscale, University of Science and Technology of China (USTC). He had been a Professor in the Royal Institute of Technology (KTH), Sweden, before was recruited by the Thousand Talents Program of China in 2008. He was awarded the Göran Gustafsson Prize in 2010 from the Royal Swedish Academy of Sciences, and the Outstanding Science and Technology Achievement Prize in 2014 from Chinese Academy of Sciences. He has published more than 470 papers in the leading international scientific journals, with total citations more than 14000, and H-index 59.