Columbia University Optics Seminar

"Microcavity Exciton-Polariton Condensates - Physics and Applications -"

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Date/Time: Monday, May 6th, 11AM –12PM
Location: 750 Schapiro CEPSR Interschool Lab

Abstract: Microcavity exciton-polaritons are hybrid light-matter quasi-particles arising from the mixed states between cavity photons and quantum well excitons. The inherent light-matter duality provides experimental advantages: the stimulated scattering among interacting particles and the small effective mass (~ 10-8 times the hydrogen atom) form coherent condensate states at high temperatures (e.g. 4 K in GaAs and room temperature in GaN materials). In addition, the dynamics of exciton-polaritons is accessed by capturing the leaked photons out of the cavity due to the short lifetime. I will first discuss the fundamental properties of non-equilibrium exciton-polariton condensates in terms of coherence and open-dissipative nature. As engineering applications, I will present the establishment of exciton-polariton quantum emulators, which may serve as a solid-state platform to investigate strongly correlated materials. And I will show our recent progress of an electrically pumped exciton-polariton device, towards the development of novel coherent light sources operating at low threshold powers.

Bio: Na Young Kim is a Physical Science Research Associate in Professor Yoshihisa Yamamoto group at E. L. Ginzton Laboratory, Stanford University. She received her Ph.D. degree in Applied Physics from Stanford University for her dissertation on Correlated Electron Transport in One-dimensional Mesoscopic Conductors. She also holds B.S. degree in Physics from Seoul National University. She was a specially apponited researher at the Univerity of Tokyo and a postdoctoral researcher at Stanford University. She is a recipient of Outstanding Young Researcher Award 2012 from the Association of Korean Physicists in America. Her research interests are to construct solid-state quantum emulators for studying macroscopic quantum phases and to demonstrate novel optoelectrical devices based on polariton condensates.

Hosted by the **Professor Philip Kim**
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