Physics Colloquium

Michigan Technological University

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at 4:00 pm
Room 139 Fisher Hall

Microcavity Exciton-Polariton Condensates Physics and Applications

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Abstract: Microcavity exciton-polaritons are hybrid light-matter quasi-particles as an admixture of cavity photons and quantum well excitons. The inherent light-matter duality provides experimental advantages to form coherent condensates at high temperatures (e.g. 4 K in GaAs and room temperature in GaN materials), and to access the dynamics of exciton-polaritons.

I will first discuss the characteristics of exciton-polariton condensates with emphasis on their intrinsic open-dissipative nature. I will present exciton-polariton-lattice systems, where we explore the non-zero momentum condensate order. We envision that the polariton-lattice systems would serve as a solid-state platform to investigate strongly correlated materials. Finally, I will show our recent progress on electrically pumped exciton-polariton coherent matter waves towards the development of novel coherent light sources operating at low threshold powers and at high temperatures.

Biography: Na Young Kim has obtained her Bachelor degree in physics from Seoul National University in 1998 and PhD in applied physics from Stanford University in 2006. She has been a postdoc at Stanford University and a researcher at Tokyo University from 2006 till 2010. Since 2010, she has been a science research associate at E.L Ginzton labs at Stanford University. Her research interests include quantum information processing with microcavity exciton polariton, mesoscopic electron transport as well as nonlinear optics. She has published more than 25 articles and given more than 10 conference presentations.

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