Ultra-high-Q microcavity optics and photonics

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Confinement and manipulation of photons using microcavities have triggered intense research interest in both fundamental and applied photonics for more than two decades. Prominent examples are ultrahigh-Q whispering gallery microcavities which confine photons by means of continuous total internal reflection along a curved and smooth surface. The long photon lifetime, strong field confinement, and in-plane emission characteristics make them promising candidates for enhancing light-matter interactions on a chip. In the first part of this talk, I will introduce some representative photonics applications of ultrahigh-Q microcavities. In the second part, I will introduce the second-order & third-order nonlinear optical processes enhanced by microcavity resonances.



Dr. Yun-Feng Xiao, New Cornerstone Investigator, Boya Distinguished Professor of Peking University. He received B.S. and Ph.D. degrees in physics from University of Science and Technology of China in 2002 and 2007, respectively. Following a postdoctoral research position at Washington University in St. Louis, he joined the faculty of Peking University in 2009. His research focuses on whispering-gallery microcavity optics and

photonics. Dr. Xiao has authored or co-authored over 200 refereed journal papers, including publications in Science, Nature Photonics, and Light: Science & Applications, among others. He is a Fellow of Optica (formerly OSA), SPIE, and COS. Additionally, he serves as the co-editor-in-chief of Light: Science & Applications and is a standing council member of the Chinese Physical Society.