

# Semiconductor valley photonic crystal waveguides and beyond

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Topological waveguides have garnered significant attention due to their robust characteristics against waveguide bends and structural imperfections. Among these, valley photonic crystal (VPhC) waveguides have been extensively studied owing to their ease of fabrication and compatibility with semiconductor-based integrated photonics platforms. In this presentation, we will briefly introduce VPhC waveguides and discuss their application as slow-light waveguides, highlighting their substantial suppression of bending losses compared to conventional slow-light designs. Furthermore, we will discuss our recent work on VPhC heterostructure waveguides that enable large-area single-mode waveguiding.



## **Short Bio:**

**Satoshi Iwamoto** is a Professor at the Research Center for Advanced Science and Technology and the Institute of Industrial Science, the University of Tokyo, Japan. He received his Ph. D. degree in Applied Physics from the University of Tokyo in 2002, where he focused on photorefractive effects in semiconductor quantum wells. His current research interests include quantum nanophotonics, topological photonics, singular optics, and nanophotonics based on wide-bandgap semiconductors. He received numerous awards, such as the Young Scientists' Prize, MEXT, Japan, the Distinguished Paper Award from the Laser Society of Japan, and the Docomo Mobile Science Award. He was elected Fellow of Optica (formerly OSA) in 2021.