

IWAMOTO LAB.

Quantum Nanophotonics, Topological Photonics,
and Wide-Bandgap Nanophotonics

Department of Informatics Electronics

Department of Electrical Engineering and Information Systems/Advanced
Interdisciplinary Studies, Graduate School of Engineering

Quantum Nanophotonics

<https://www.iwamoto.iis.u-tokyo.ac.jp/en/>

Control of Photons by Photonic Nanostructures and its Applications

- Opening new directions of photonics based on physics, nanotechnology, and material engineering -

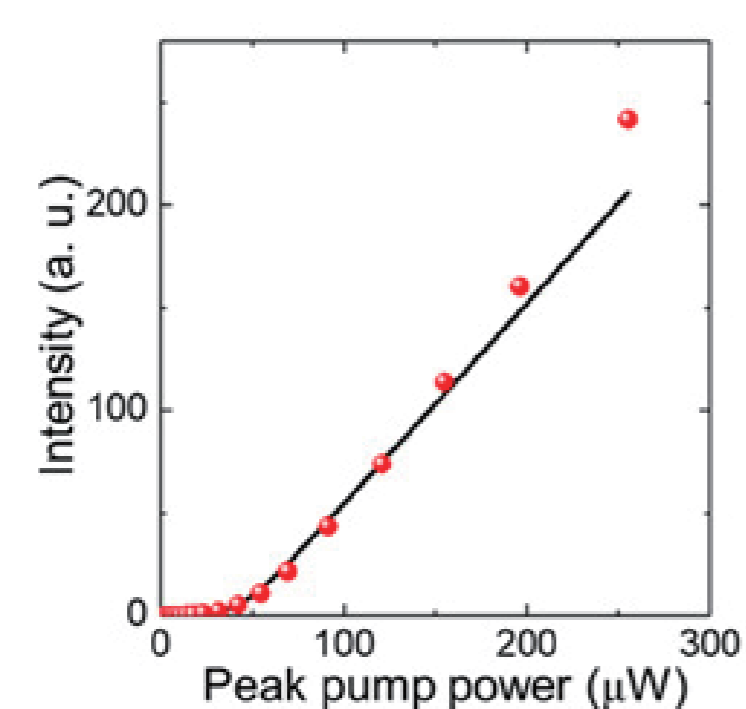
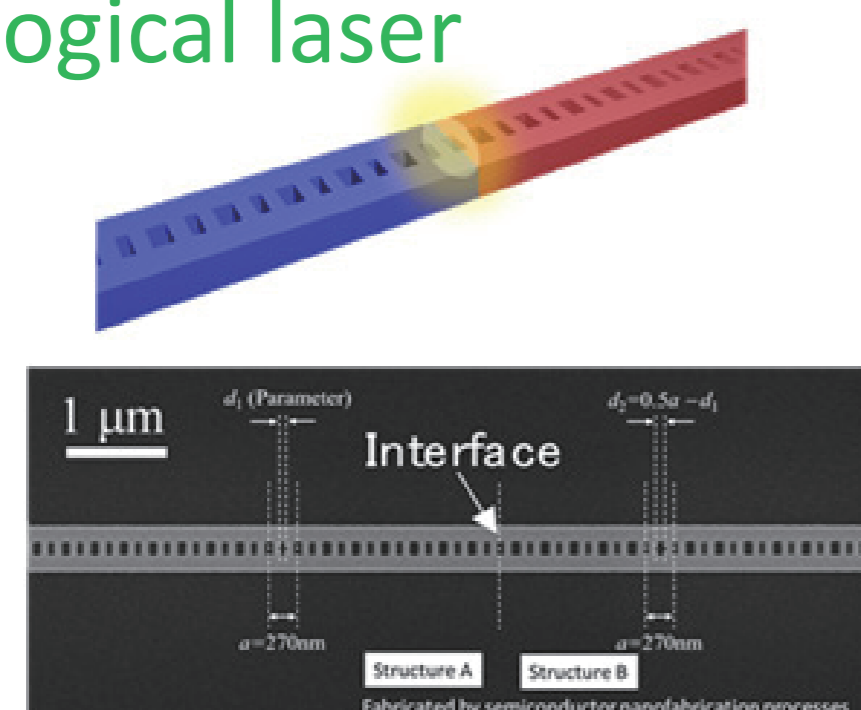
Overview: We are investigating photonic nanostructures including photonic crystals for diverse applications. In particular, we are pursuing unprecedented technologies controlling light and novel photonic devices based on the concept of topology, which provides an intriguing approach to controlling light. Our research interests also include quantum optics and light-matter interactions in photonic nanostructures, nanophotonics using wide-gap materials like diamond and gallium oxide, and novel fabrication methods/technologies for nanophotonic devices.

- Main research subjects:**
- Design and fabrication technology of photonic nanostructures
 - Novel optical phenomena in photonic nanostructures
 - Quantum nanophotonics based on photonic nanostructures
 - Topological photonics / phononics, Non-Hermitian optics
 - Nanophotonics with wide-bandgap materials

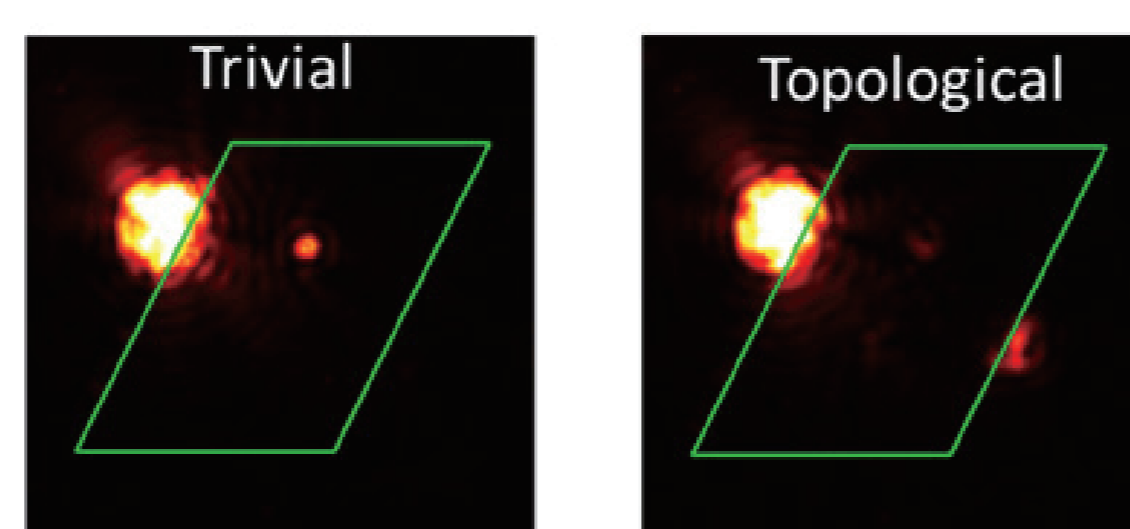
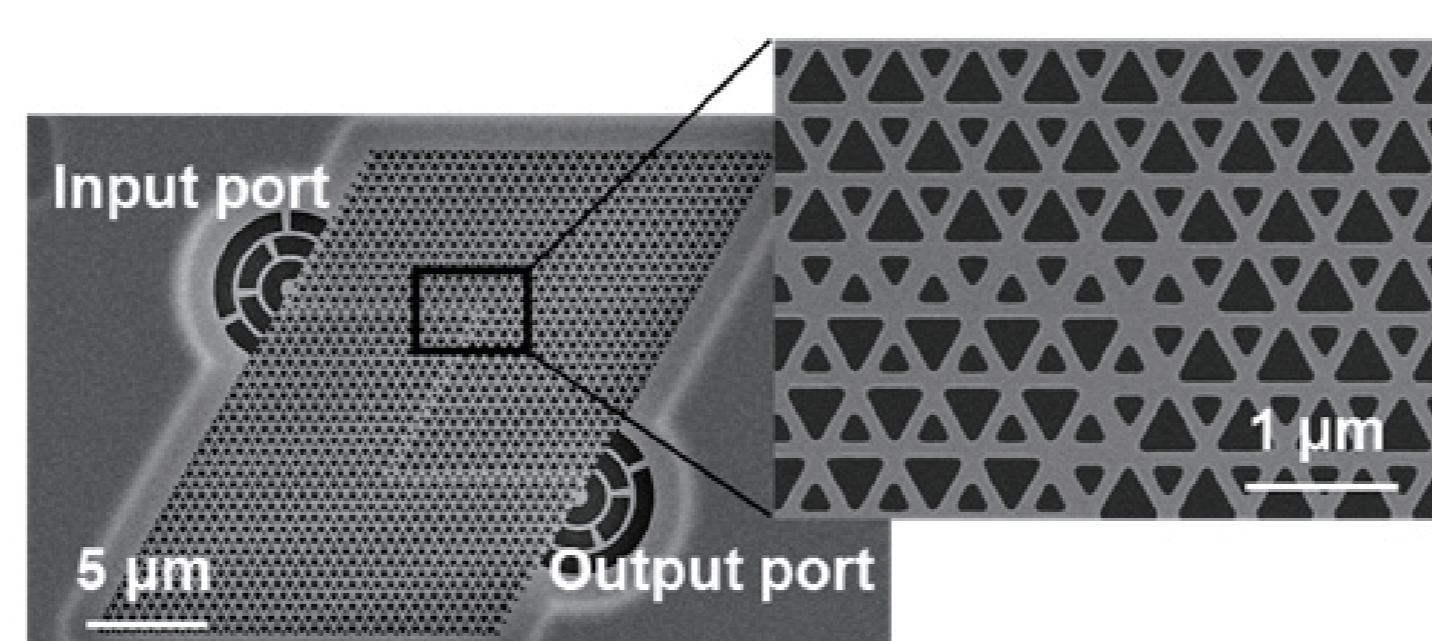
Topological Photonics

Quantum Nanophotonics

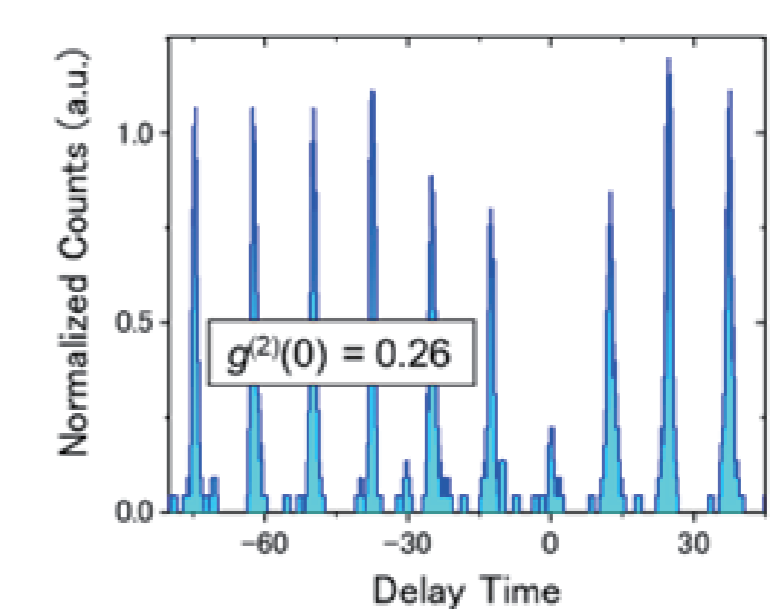
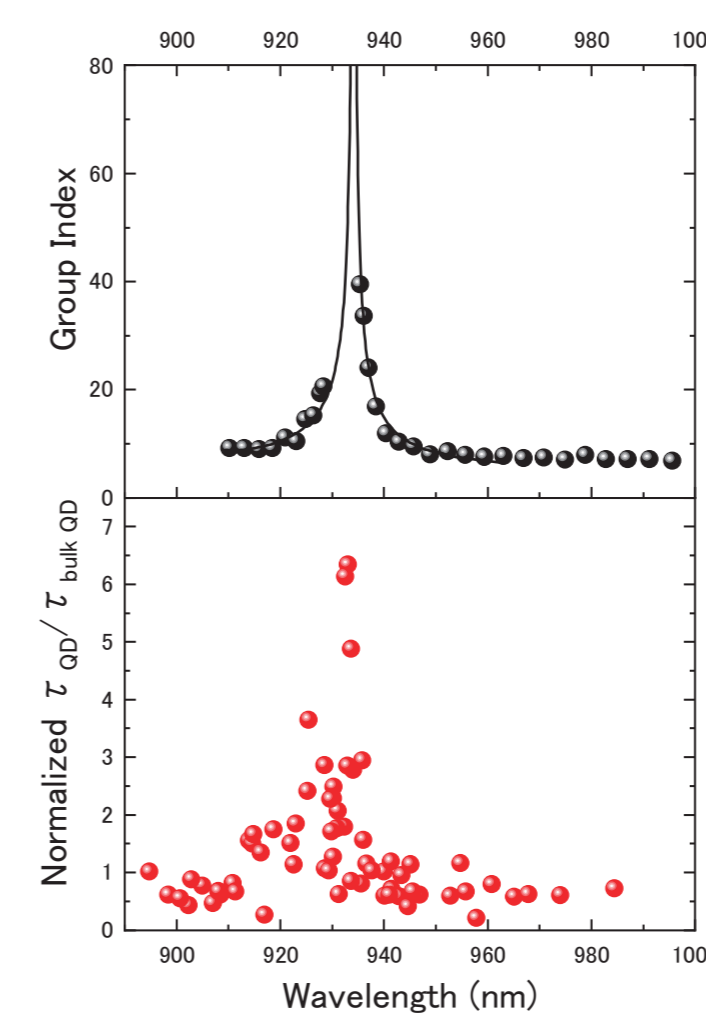
Topological laser



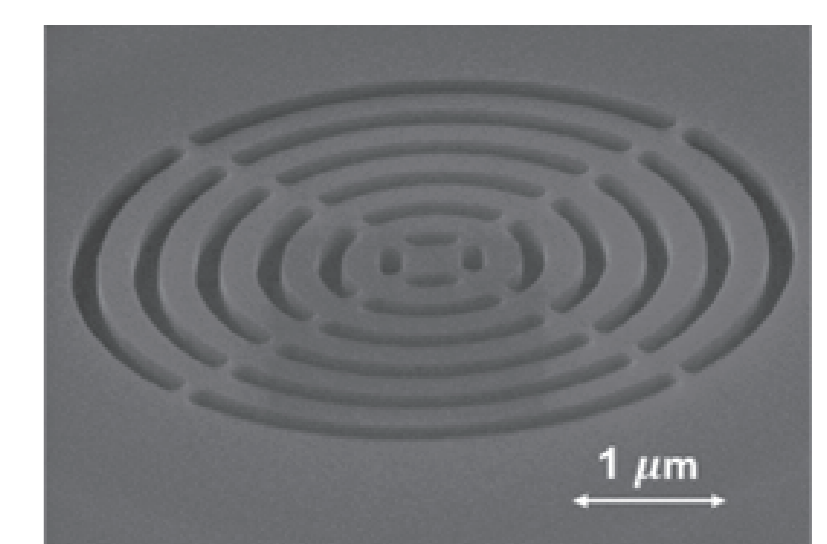
Topological slow-light waveguide

Group index ~ 20

Quantum light sources



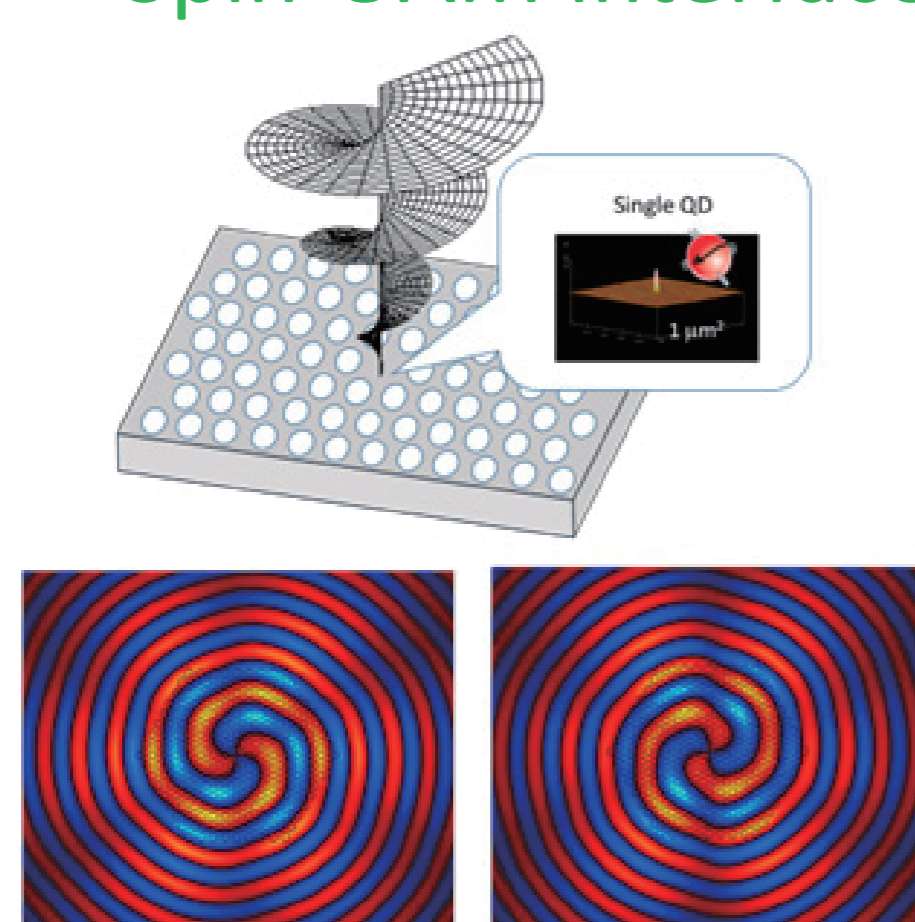
Quantum interface



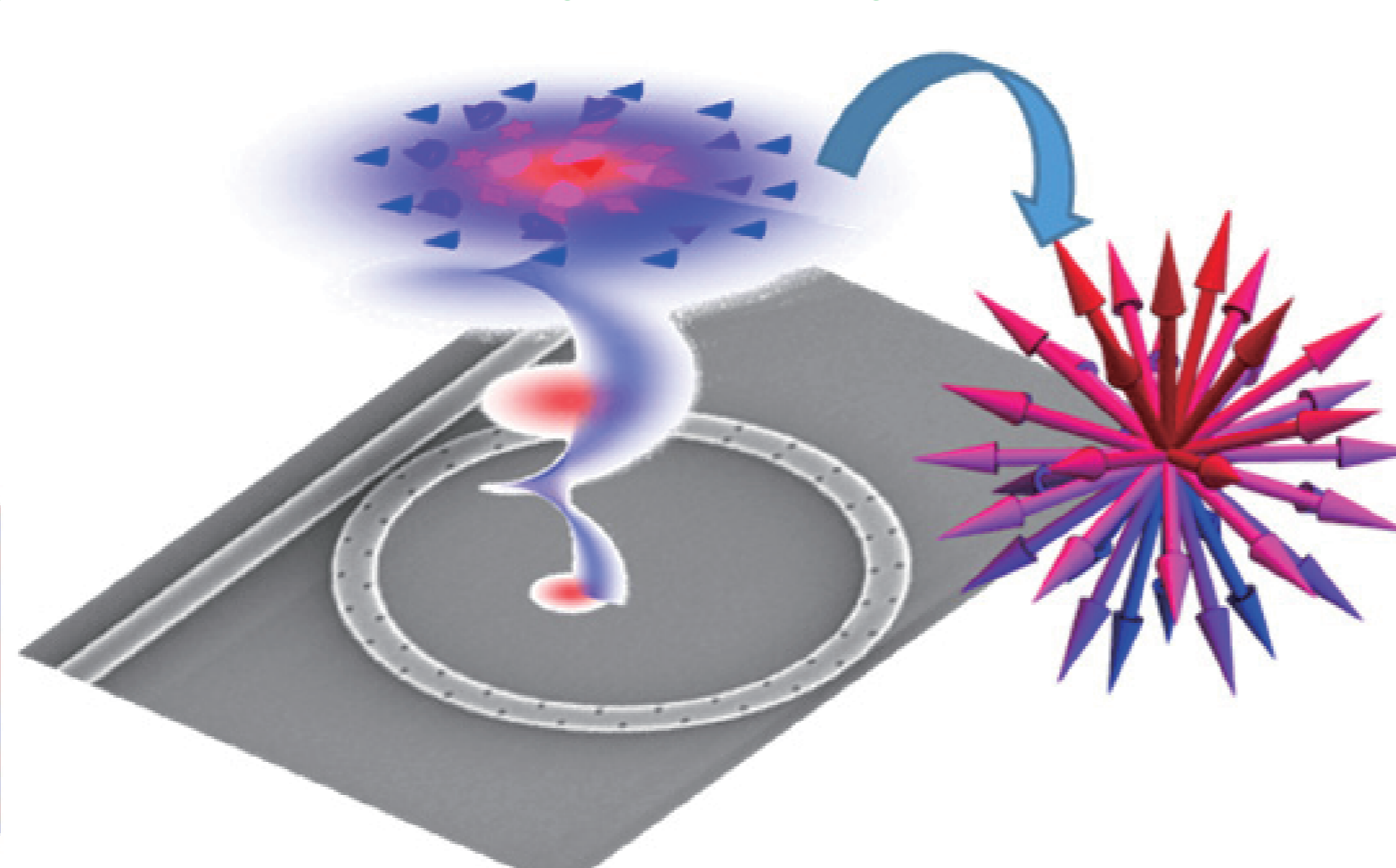
Structured Light and Singular Optics

Wide-Bandgap Nanophotonics

Spin-OAM interface



Optical Skyrmion



Diamond photonic crystal nanocavity

