

## Reconfigurable Photonic Surfaces created by Self-Assembled Amphiphilic Tiles at Air-Water Interfaces

김종빈, 이건호, 김신현<sup>†</sup>

KAIST

(kim.sh@kaist.ac.kr<sup>†</sup>)

Photonic crystals exclude certain wavelengths of which accumulative reflection occurs so that the constructive interference of light makes structural colors. The majority of creatures in nature have a functional photonic surface that exists in the assembled form of macroscopic photonic granules composed of microscopic periodic structures. Most of the artificial photonic surfaces have been constructed on a solid film which hinders its reconfigurability. Here, amphiphilic photonic tiles are assembled at the air-water interface by the capillary force. The photonic tiles have a nonclose-packed array of air cavities and their one side is physically etched and fluorinated to make it almost superhydrophobic by Cassie-Baxter model. Their assembly results in the reconfigurable photonic surface in two-dimensional space that can also be transferred onto various solid substrates. It can form a liquid marble surrounded by photonic tiles and builds a photo-protective room for algae or cells. Namely, the assembly of photonic tiles extends the usage of the photonic surface onto a liquid and enables reconfigurable two- and three-dimensional morphologies of photonic surfaces.