

# MORITAKE LAB.

## Physics and Engineering of Light using Artificial Nanostructures



Department of Fundamental Engineering  
Nikon Optics and Precision Frontiers

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Meta-Optics

[https://www.moritake.iis.u-tokyo.ac.jp/index\\_e.html](https://www.moritake.iis.u-tokyo.ac.jp/index_e.html)

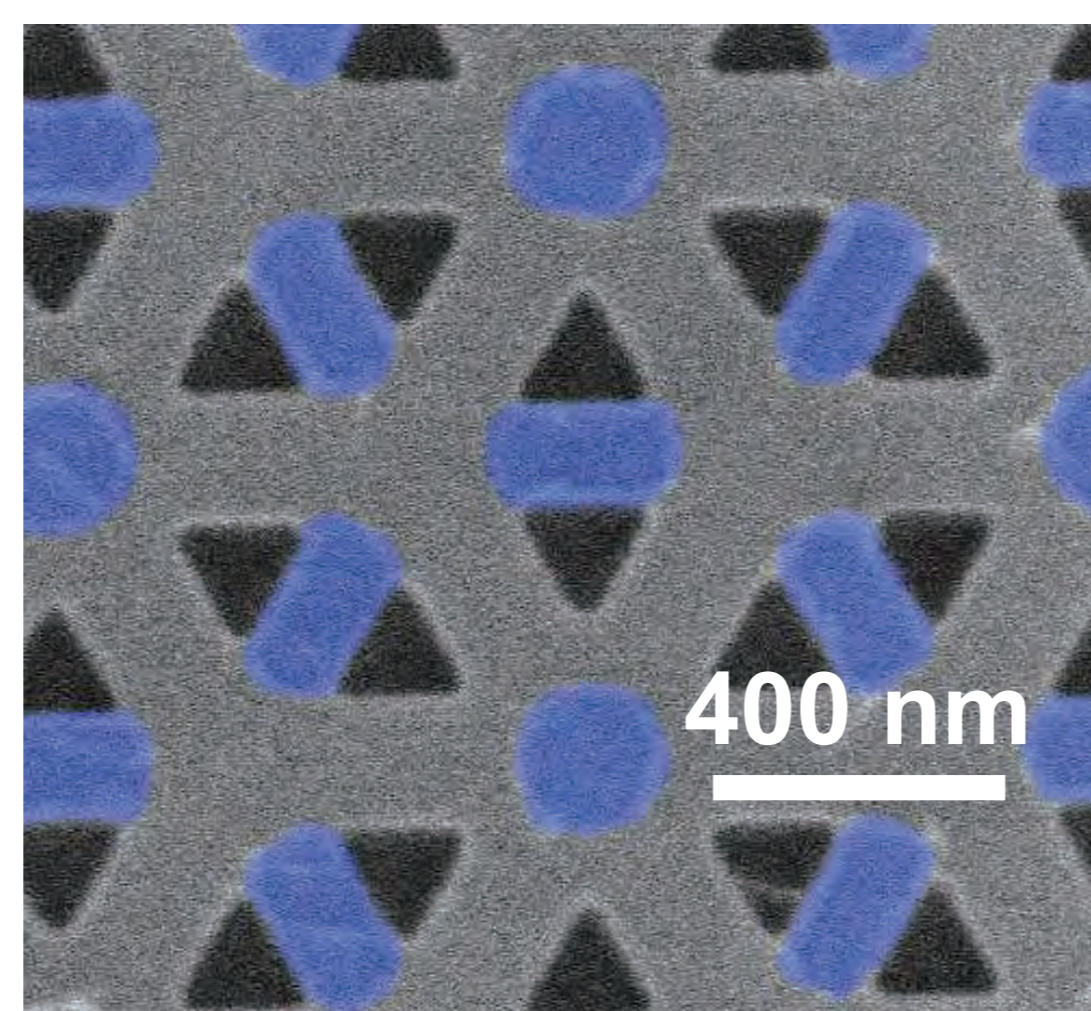
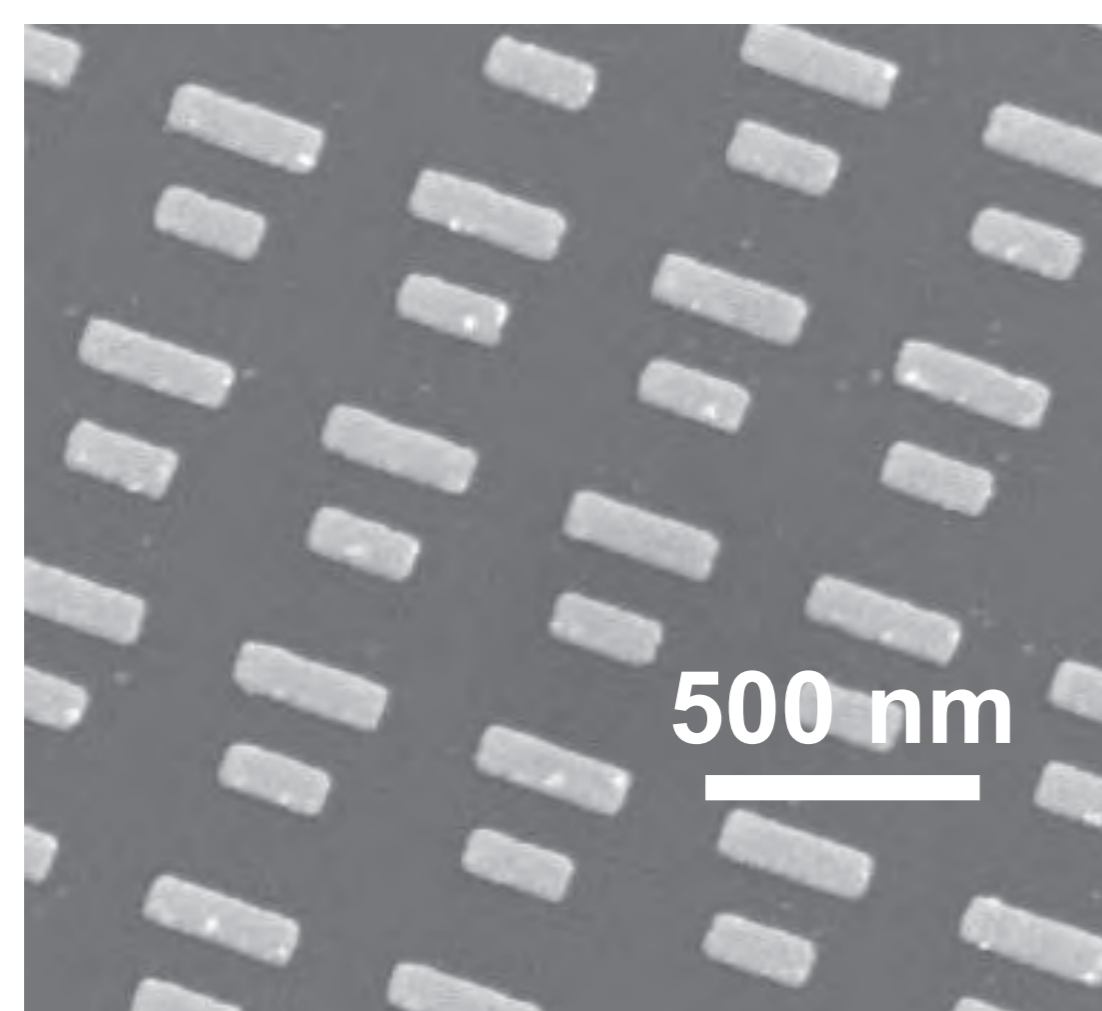
People have used lenses and mirrors to control light for a very long time. Today, new fabrication technologies allow us to make **extremely small artificial structures**. These structures can be as small as the wavelength of light, which is about 500 nanometers.

These tiny structures are called **metasurfaces and photonic crystals**. At this very small scale, light behaves strongly as a wave. This allows us to **control light in new ways that are difficult with ordinary lenses and mirrors**.

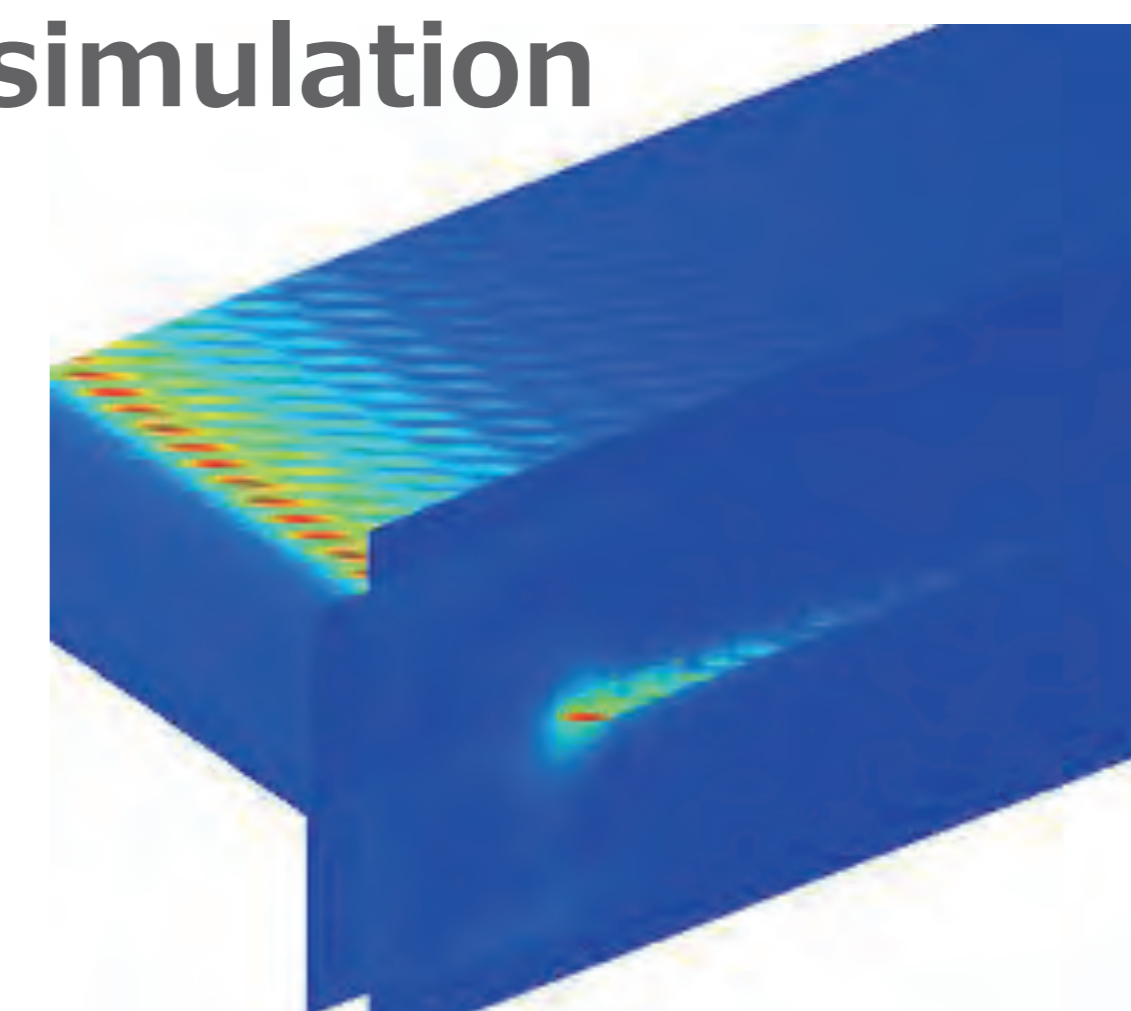
In our research, we design these nano- and microscale structures to **find new ways to control light**. In particular, we use metasurfaces as experimental tools to study new optical physics and phenomena, and to create new optical functions.

We hope this research will lead to **better optical devices and new technologies in areas such as optical communication, optical computing, and sensing**.

### Fabricated nanophotonic structures



### Electromagnetic simulation



### Microscopic optical measurements

