

## Tunable Colors from Metal Nanomirrors

**Track Code:** 2018-SONG-68286

**Categories:**

- Computer Technology
- Micro & Nanotechnologies

**Keywords:**

- Computer Technology
- Localized Surface Plasmons
- Micro & Nanotechnologies
- Plasmonic Color
- Polarization Multiplexed Device
- Structural Color
- Tunable Color Filters

Plasmonic nanostructures have been used recently to scatter light of different colors depending on their geometry and composition. Plasmonic color filters are becoming popular because they have a high resolution, are environmentally friendly, and are mechanically/chemically robust. The rapid development in the area of data storage and security calls for extra tuning parameters to increase levels of information states.

Researchers at Purdue University have developed a dynamically tunable color filter based on a wavelength-dependent optical rotation effect. This technology can be designed for highly secure information encryption. Careful arrangement of differently oriented nanoantennas can be used to further increase the encoded information states and achieve highly secure encryption. This technology is better than existing solutions due to its capability of multiplexing highly distinguishable images with a single device, offering cheap and scalable manufacturing, high purity color generation, and high tolerance to viewing angles.

**Advantages:**

- Highly distinguishable images with single device
- Cheap, scalable device manufacturing
- Nontoxic and environmentally friendly
- High purity color generation

**Potential Applications:**

- Active color displays
- High-density optical data storage
- Security tagging
- Cryptography

**People:**

- Song, Maowen (Project leader)
- Boltasseva, Alexandra
- Kildishev, Alexander V.
- Shalaev, Vladimir M
- Wang, Di
- Wang, Zhuoxian
- Xuan, Yi

**Intellectual Property:**

**Application Date:** April 7, 2021

**Type:** CON-Gov. Funding

**Country of Filing:** United States

**Patent Number:** (None)

**Issue Date:** (None)

**Application Date:** May 13, 2019

**Type:** Utility Patent

**Country of Filing:** United States

**Patent Number:** (None)

**Issue Date:** (None)

**Application Date:** May 17, 2018

**Type:** Provisional-Patent

**Country of Filing:** United States

**Patent Number:** (None)

**Issue Date:** (None)

**Contact OTC:**

Purdue Office of Technology Commercialization  
The Convergence Center  
101 Foundry Drive, Suite 2500  
West Lafayette, IN 47906

Phone: (765) 588-3475

Fax: (765) 463-3486

Email: [otcip@prf.org](mailto:otcip@prf.org)