

# Enhancing Light-Matter Interactions In Mos2 By Copper Intercalation

Tech ID: 33397 / UC Case 2021-891-0

## ABSTRACT

Researchers at the University of California, Davis have developed layered 2D MoS<sub>2</sub> nanostructures that have their light-interactive properties improved by intercalation with transition and post-transition metal atoms, specifically Copper and Tin.

## FULL DESCRIPTION

The technology involves photodetectors made of 2-dimensional vertically-aligned MoS<sub>2</sub> layers. The van der Waals gap in at least two layers of MoS<sub>2</sub> is intercalated with metal atoms such as Copper and Tin to enhance light-matter interactions. These intercalated atoms introduce electronic states near the MoS<sub>2</sub>'s conduction band, boosting the photodetector's efficiency, especially in the near-infrared spectrum.

## APPLICATIONS

- ▶ Optical sensors such as photodetectors
- ▶ Night-vision image intensifiers
- ▶ Technologies operating in low-light conditions or high vegetation terrain.

## FEATURES/BENEFITS

- ▶ Enhanced light-matter interactions in near-infrared spectrum
- ▶ Improved photodetector efficiency
- ▶ Increased photoresponsivity and absorption capabilities in the infrared range.
- ▶ Addresses weak absorption in IR spectral region of 2D MoS<sub>2</sub> devices
- ▶ Solves inefficient light-interactive properties of 2D MoS<sub>2</sub> structures.

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	<a href="#">12,037,259</a>	07/16/2024	2021-891

Additional Patents Pending

## CONTACT

Victor Haroldsen  
[haroldsen@ucdavis.edu](mailto:haroldsen@ucdavis.edu)  
 tel: 530-752-7717.



## INVENTORS

- ▶ Koski, Kristie

## OTHER INFORMATION

### KEYWORDS

MoS<sub>2</sub>, nanostructures, near-infrared spectrum, light-interactivity, light-matter interaction, photodetector, photoresponsivity, optical sensors

### CATEGORIZED AS

- ▶ **Optics and Photonics**
  - ▶ All Optics and Photonics
- ▶ **Engineering**
  - ▶ Engineering
  - ▶ Other
- ▶ **Materials & Chemicals**
  - ▶ Nanomaterials
  - ▶ Other

▶ **Nanotechnology**

▶ Materials

▶ Other

▶ Tools and Devices

**RELATED CASES**

2021-891-0

**University of California, Davis**

**Technology Transfer Office**

1 Shields Avenue, Mrak Hall 4th Floor,

Davis, CA 95616

Tel:

530.754.8649

[techtransfer@ucdavis.edu](mailto:techtransfer@ucdavis.edu)

<https://research.ucdavis.edu/technology-transfer/>

Fax:

530.754.7620

© 2024, The Regents of the University of California

[Terms of use](#)

[Privacy Notice](#)