MAY, 2025

OPTICA
Advancing Optics and Photonics Worldwide

Optics for Energy

# NEWS LETTER

# OPENING MESSAGE

**By Banafshe Zakeri**

**The very first step for an effective communication towards a lasting, meaningful connection is to simply show up.**

As the new committee of Optics for Energy Technical Group, we put a great value on communication. We believe that we can use and make sense of the huge available information in the world, only if we share our acquired knowledge and experiences together. Through discussion we can bridge between disciplines and help to separate the noise from real information. This bi-weekly newsletter is one of our many plans to do so. Our goal is to bring you some useful news and information in the joint area of optics and energy. Therefore, knowing about your areas of interest will help us to gather the right information for you. This is also a platform for you to share your work with your fellow members. Send us your content! It can be a photo, a recent achievement in your work which has excited you, or any inspiring story. We promise, we'll make a place for them here.

Simply saying, with this newsletter we would like to get one step closer to you. But we kindly ask you to take your part. Even one small step will make a big difference.

# SUMMARY OF THE KICK-OFF SESSION

**The kick-off session was organized by the new Executive Committee of the Optica Optics for Energy Technical Group. Here is a short summary.**

## Mission and Goals

The group aims to connect professionals and students in optics and energy through: Technical events ,Educational webinars,Networking activities,Social media engagement.


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## Acknowledgement


👏 Many Thanks to the previous Executive Committee (2022–2024) , led by Dr. Nikhil Deep Gupta, for their contributions and efforts for managing the Technical Group events for the last three years.



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# SUMMARY OF THE KICK-OFF SESSION

**Webinar Formats:**

- Single-speaker sessions with Q&A
- Multi-speakers thematic series
- "Welcome to My Lab" online visits
- Combined formats: presentations and lab tours

**Webinar Topics:**

- Emerging materials and technologies such as: Metamaterials, Perovskites, Biophotovoltaics
- Optical devices and optoelectronic characterization
- Optical sensors for energy applications

**Interactive Events:**

- Member-led topic discussions on slack
- Online "Coffee Chat" for making connections inside the group
- "Ask Me Anything about ..." with invited speakers
- Virtual lab visits and personal project pitches from members
- “This Is What I Do” series by group members

**Additional Events:**

- In-Person Events
- Joint events with other Technical Groups
- Joint events with other communities

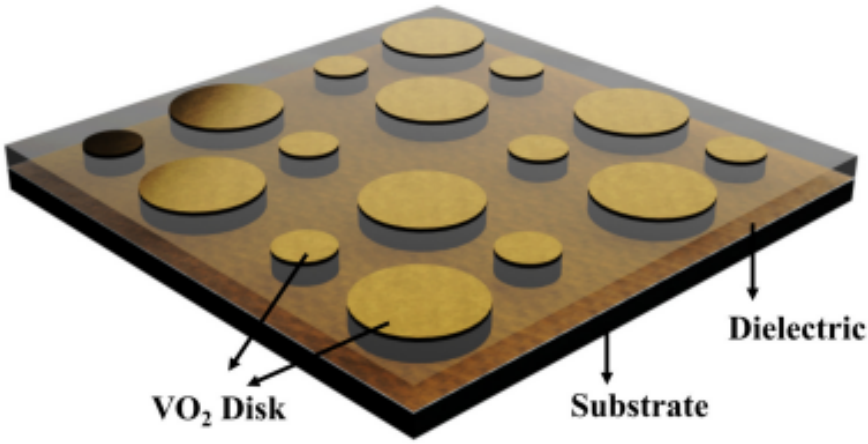
# PUBLICATION REVIEW

Vanadium dioxide-based metasurface for temperature-adaptive radiative cooling.
Authors: Xiaojie Sun et al.

## Introduction

As global temperatures rise, researchers are rapidly advancing cooling technologies that operate without external energy input or carbon emissions. Researchers from Fudan University and the University of Alabama in Huntsville developed a smart metasurface that passively regulates heat emission by adapting to temperature changes

*3D modeling of the two-size VO2 metasurface*




## Why it matters

This work adds a new chapter to passive climate control, offering a zero-energy, scalable alternative to traditional cooling. With applications spanning from smart buildings to wearable tech and even spacecraft, it's a step closer to truly intelligent surfaces that respond to nature—just like living systems.

At the heart of their design is vanadium dioxide ($VO_2$), a well-known phase change material. Below 68 °C, $VO_2$ behaves like an insulator above that, it flips to a metallic state. This switch changes how it absorbs and emits thermal radiation. The authors design a metal-dielectric-metal (MDM) absorber incorporating two sizes of $VO_2$ microdisks into a supercell on a layered substrate. This supercell configuration enables broadband absorptivity across the 8–13 μm atmospheric window and realizes a significant cooling power contrast (~100 W/m²) between its "on" (metallic) and "off" (dielectric) states.the team engineered a surface that self-adjusts its cooling performance in real time. The metasurface maintains angular stability (40°) ideal for flat surfaces, reflects sunlight well, and could be improved via tungsten(W) doping and layered reflector

https://doi.org/10.1117/1.OE.64.2.027102

# UPCOMING EVENT
# THIS IS WHAT I DO


## PROF. AHMED HISHAM MORSHED
## AIN SHAMS UNIVERSITY


**DATE:29 MAY 2025**
**TIME: 12:30 - 13:30 EDT**
**18:30 - 17:30 CET**

## INTRODUCTION

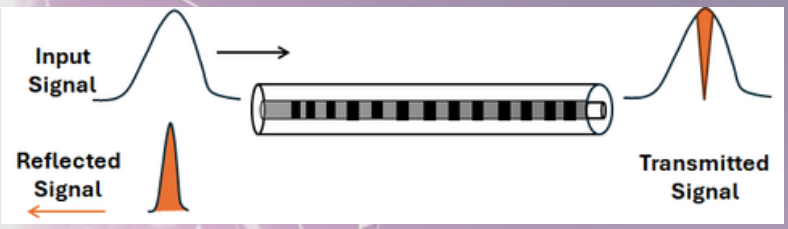
Following the idea of bringing the group members more in discussion and connection with each other, Ahmed will be the first speaker from the group who wants to share his research on “Fiber Sensors for Monitoring pressurized pipes”.

Pipelines are vital to many commercial and civil sectors, including the energy sector. Their damage or malfunction is thus very undesirable. Their in-service monitoring to avoid the occurrence of such events is an important task, which requires the installation and networking of sensors along the pipelines to continuously check their status for abnormal operating conditions. The use of optical fiber sensors for these measurements is of a special interest because of the advantages it offers over other techniques.

## EXAMPLES OF OPTICAL FIBER SENSORS

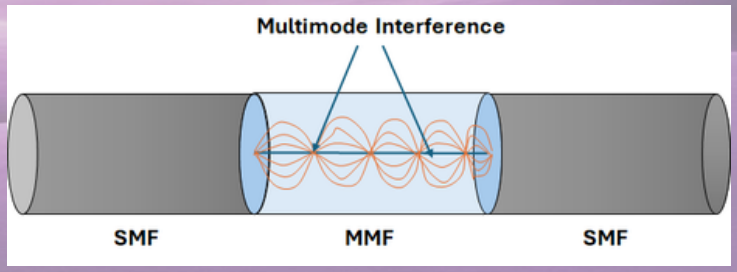
### FBG-SENSORS

Fiber Bragg Grating (FBG) sensor, in which the measured information is wavelength-encoded in the Bragg reflection of the grating, has been exploited in strain measurement. However, the use of spectral measurements limits their measuring speed to the relatively low speed of spectral scanning, which is a mjor challenge for dynamic sensin. Moreover, fiber gratings are not easy to produce.




### MMI-SENSORS

Multimode interference (MMI) sensor with a single mode-multimode-single mode structure is an alternative type of fiber sensor due to the ease of fabrication, simple operation and potentially low cost is an alternative fiber sensor technique.




**Join us for this online webinar to know more about various fiber sensor techniques and their potential applications for strain measurements.**

# Inspiring story

By Idris Adeshina Sulaimon

**Let's shine**

Each one of us has a story to tell. They might not be one of those fantasies which take you to a dreamy world! But they are powerful reminders of why we do what we do.

My story started from an underserved village! Not a shining start! Sorry! But keep reading, it will end at shining thanks to my curiosity and the path I took in science and especially in optics.

Growing up, I read by candlelight, amazed that something as gentle as light could be so powerful. That curiosity carried me from a humble beginning to the pinnacle of optics and energy science, to energy materials research. And this is my actual start, not that village, but an endless discovery!

But it has never been about me.

It was about Aisha, a 16-years-old girl from a small village that was underserved by energy, who has the privilege to watch one of our webinar recordings. She wanted to "catch sunlight and store it for the night." Or think of Samuel, a high school student in a developing country who was dreaming to build a solar-powered charging station out of junk and now instructs others to do the same.

My story was going to be connected with their stories to become special. And there would be many more of these connections on the way, I'm sure!

These are not science fictions, but science can make fictions. These stories are the living evidence that light, scientific or otherwise, can shine into spaces where hope has flickered.

We at Optics for Energy Technical Group aim to do more than photonic technologies introductions; we want to build bridges between labs, industries, classrooms, researchers, and communities, and between passion and purpose.

Thank you for being with us on this journey.

**What about your story, share it with us!**

## Communication 💬 and Engagement

Use our social media platforms: *Facebook*, *Slack*, *LinkedIn*, and email (**TGactivities@optica.org**) for discussion, information sharing, and event updates

**These are some suggested topics for our discussion forums during upcoming weeks in our social media channels:**

Click here to join Optica Technical Group on Optics for Energy

### Interdisciplinary vs cross-disiplinary research

Click here to join Optica Optics for Energy Technical Group

### Optical techniques and the discovery of new materials for energy sector

Click here to join Optica Optics for Energy Technical Group

### Improving your communication skills = Growing in your career

A selection of your opinions on each topic will be highlighted in the next newsletter

We encourage members to share webinar ideas, their topics of interest, and content via email to the Executive Committee, whose personal contact details are provided in the front page. Applications including a topic and a short summary of your research for presenting in our series "This is what I do" are welcomed at any times. Providing information about your research and scientific background will make the connection for possible collaborations easier.
**Use this chance to make your work more visible.**

# Future Event:

**This is what I do:**
Developing fiber sensors for monitoring pressurized pipes

Click here for Registration Link

# Coming soon:

- **Panel Discussion with Industry Experts**
- **Collaboration Coffee Chats; Boost your connection inside the group**