

# Conference Tutorials

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**META 2024** will feature **several** technical **tutorials** instructed by **world-leading experts** on various topics of interest to the META community. Tutorials are intended to provide a high quality learning experience to conference attendees.

## Registration

The tutorials are part of the conference technical program, and are **free of charge to the conference attendees**.

## Who Should Attend?

The tutorials will address an audience with a varied range of interests and backgrounds: **beginners, students, researchers, lecturers** and **representatives of companies, governments and funding agencies** who wish to learn new concepts and technologies.

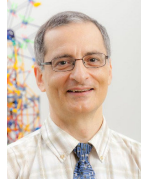
## When?

July 16-19, 2024.

## Where?

Tutorials will be held at the conference venue

## Tutorials & Instructors



## Tutorial 1: "Topological Origin of Surface Maxwell Waves and Surface Acoustic Modes"

**Prof. Franco Nori** ([https://www.riken.jp/en/research/labs/chief/theor\\_qtm\\_phys/](https://www.riken.jp/en/research/labs/chief/theor_qtm_phys/)), Riken (Japan) and University of Michigan (USA)

**Tutorial length:** 1 hour

**Description:** Interfaces between optical media (including dielectrics, metals, negative-index materials) can support surface electromagnetic waves, which now play crucial roles in plasmonics, metamaterials, and nano-photonics. We have shown [K.Y. Bliokh et al., Nat. Commun. 10, 580 (2019) (<http://dx.doi.org/10.1038/s41467-019-08397-6>)] that surface Maxwell waves at interfaces between homogeneous isotropic media described by real permittivities and permeabilities have a topological origin explained by the bulk-boundary correspondence. This is explained by the nontrivial topology of the non-Hermitian photon helicity operator in the Weyl-like representation of Maxwell equations. The corresponding topological invariant, which determines the number of surface modes, describes the winding of the complex helicity spectrum across the interface. Our theory provides a new twist and insights for several areas of wave physics: Maxwell electromagnetism, topological quantum states, non-Hermitian wave physics, and metamaterials. We have also analyzed [K.Y. Bliokh et al., Phys. Rev. Lett. (2019) (<https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.123.054301>)] another type of classical waves: longitudinal acoustic waves corresponding to spinless phonons. We show that surface acoustic waves, which appear at interfaces between media with opposite-sign densities, can be explained by similar topological features and the bulk-boundary correspondence. However, in contrast to photons, the topological properties of sound waves originate from the non-Hermitian four-momentum operator in the Klein-Gordon representation of acoustic fields.



## Tutorial 2: "Writing and Submitting Your Papers"

**Dr. Rachel Won** (<https://www.nature.com/nphoton/about/editors>), Nature Photonics, UK

**Tutorial length:** 1 hour

**Description:** This talk covers the detailed information and guidelines on scientific paper preparation and submission, including tips for writing an effective cover letter, an informative abstract, a comprehensive introduction and an attractive paper, and editorial and peer-review processes. You will also get to know how to choose a journal for submission, what editors seek, how your papers are reviewed and how to make an appeal.