

Draft Proposal for ACP2017

Full title of workshop:

Exploiting the space domain of electromagnetic waves: the ongoing frontiers

Jointly hosted by:

China 973 Project 2014CB340000

EU H2020 Project 'ROAM'

China 973 Project 2014CB340100

China NSFC Project 61490710

Part I: Structured Lights and Their Applications

Workshop Time: 09:00–12:30, Friday, 10 November

Venue: The Garden Hotel, Begonia Room

Part II: Space-division Multiplexing (SDM) Communication

Workshop Time: 14:00–18:10, Friday, 10 November

Venue: The Garden Hotel, Begonia Room

Organizers:

Xinlun Cai, Sun Yat-sen University, China;

Xiacong Yuan, Shenzhen University, China

A brief descriptions of the technical scope of the workshop (up to 500 words):

Almost all the applications of electromagnetic waves are about the manipulation of their physical dimensions including frequency/wavelength, complex amplitude, time, polarization, and space. The space domain is considered the only known physical dimension left to exploit in newly emerging applications of electromagnetic waves. As the ongoing frontiers, exploiting the space domain of electromagnetic waves has fueled lots of interesting research fields. For instance, structured lights accessing the spatial amplitude/phase/polarization distributions of lightwaves have given rise to many developments in astronomy, manipulation, trapping, tweezer, microscopy, imaging, sensing, nonlinear interactions and quantum information processing. Very recently, space-division multiplexing (SDM) is known as the only long-term viable path for sustained capacity scalability in optical communication networks, from short-reach data center interconnects and optical access networks to long-haul transport systems.

This workshop will focus on the ongoing frontiers in exploiting the space domain of electromagnetic waves. Two parts (structured lights and their applications, SDM communications) will be covered. Topics of relevance include but are not limited to:

- Part I: Structured lights and their applications
- ✓ Physics and fundamental properties of structured lights

- ✓ Different kinds of structured lights (LG beams, HG beams, Bessel beams, OAM beams, vector beams, accelerating beams, etc.)
- ✓ Devices for structured light generation, manipulation and detection
- ✓ Structured light enabled applications (astronomy, manipulation, trapping, tweezer, microscopy, imaging, sensing, nonlinear interactions, quantum information processing, etc.)
- ✓ Structured electromagnetic waves and their applications (radio wave, microwave, terahertz wave, etc.)
- Part II: Space-division multiplexing (SDM) communications
 - ✓ Free-space and fiber-based SDM communications.
 - ✓ Multi-core fiber (MCF), few-mode fiber (FMF), multi-mode fiber (MMF), ring-core fiber (RCF) and other specialty fibers and photonic integrated devices for SDM communications.
 - ✓ Efficient (de)multiplexing and amplification techniques for SDM communications.
 - ✓ Multiple-input multiple-output (MIMO) assisted SDM communications and MIMO free SDM communications.
 - ✓ Optical switching, optical signal processing and various networking functions in SDM communications.
 - ✓ Information capacity scalability and limits in SDM communications.

We sincerely welcome scientists, students and industry representatives of relevant interest to attend and join the workshop.

List of Speakers (if available)

TBD