



哈尔滨工程大学  
HARBIN ENGINEERING UNIVERSITY

物理与光电工程学院

# Light Seminar 理学之光科学家论坛

**Title:** Smartphones for spectroscopy: some examples

**Speaker:** Prof. Anna Grazia Mignani, CNR Research staff, Director of Research  
Seconded National Expert in Bruxelles at the European Research Council  
Executive Agency (ERC-EA) of the European Commission

**Beijing Time:** 16:00-17:00 p.m., Tuesday 28 Sep. 2021 (10:00-11:00 a.m. Central European time)

**Tencent Meeting ID:** 317 5599 7687, **Link:** <https://meeting.tencent.com/dm/agTV88VOgzRJ>

**Organizer:** 物理与光电工程学院青年科协, “111”引智基地, “纤维集成光学”教育部重点实验室, 哈尔滨工程大学

## Abstract:

Smartphone users in the world are about 3.8 billion in 2021. This ubiquitous penetration makes the smartphone the must-have Swiss-knife of the 21st century, thanks to the functions, sensors, and integrated gadgets it offers in addition to calling, texting, or surfing the web. The camera of the smartphone is a low-resource spectrometer, with an integral sensitivity in three bands somehow overlapping. Consequently, the smartphone can be conveniently used as a photonic platform for sensing and for spectroscopy for a variety of applications, ranging from clinical diagnostics, health monitoring and biosensing, to food analysis, safety, and allergen detection. The Bluetooth connectivity turns the smartphone into a technological octopus whose tentacles can interact with other electronic devices nearby, while cloud-based data computing allows for unprecedented functionalities, with limits dictated only by imagination and fantasy. Indeed, a very convenient use of the smartphone is to exploit the Bluetooth connectivity for operating and dialoging to a miniaturized spectrometer. This talk presents some examples of how to use a smartphone for spectroscopy, either using add-on optics on the camera and by means of a Bluetooth-connected miniaturized spectrometer.

## Biography:

Anna Grazia Mignani, a physicist by training, is Senior Scientist at CNR, the National Research Council of Italy, where she works since 1984. Her work started with designing and experimenting fiber optic sensors and networks for temperature and vibration monitoring, then continued with spectroscopy-based sensors for environmental applications, especially for water monitoring. Her most recent activity focuses on spectroscopy for food applications, especially for multi-analysis of safety, quality, and nutraceutical indicators by means of a single light shot and multivariate processing of spectroscopic data. Her work has been presented to plenary and invited talks worldwide and is published in journal papers, book chapters and conference publications. She managed European and national research grants on applied optical sensing, and holds 9 US and EU patents. She has been visiting scientist in laboratories in Belgium and Ireland, and is serving international funding agencies as expert evaluator, project reviewer, and advisor. She co-chaired and promoted several SPIE conferences on optical sensing, and has been a proponent of women in physics at UNESCO. She is Associate Editor of IEEE-Photonics Technology Letters and of IEEE Sensors Journal, and has served the IEEE Sensors Council as member-at-large. She is SPIE Fellow, and is currently serving SPIE on the board of directors.



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