

Short course description

Light and light sensing plays a fundamental role in a large number of technologies. In quantum physics working at the single-photon level has been standard practice for many years. As technology advances, increasingly more light-based applications strive to achieve ultimate performance which often means working with single photon detectors. These are used on a large number of scientific, industrial and even consumer applications such as mobile phones and cars. Single-photon devices are evolving quickly and this course will highlight the latest technologies, techniques, applications and challenges. The course will be structured as follows:

- 1) The advantage of working at the single-photon level
- 2) Current trends in the use of single-photon systems in applications both quantum and classical. (Cryptography, random number generation, imaging, ranging, fiber characterization, ...)
- 3) Advances in Geiger-mode single-photon detectors
- 4) Advances in Superconducting Nanowire detectors
- 5) Processing data from single-photon detectors at ultra-high speed.
- 6) Open questions and answers throughout