

Graphene Quantum Dots as High Purity Single Photon Sources

Researchers around Jean-Sebastien Lauret from France are researching new materials like graphene and hybrid perovskites for use in quantum, plasmonics, nanophotonics and magnetometry applications. They have shown that graphene quantum dots can be used as high purity single photon sources. These special light sources are important for quantum research applications and quantum computers.

The researchers are using a microscopic photoluminescence setup for their measurements. One measurement channel determines the single photon character of the source by measuring the correlation between signal on two photodiodes.

The other channel is for sensitive, dispersive PL spectroscopy using a SpectraPro spectrograph with a Pylon camera. The PL spectrum is an important characterization tool in nanophotonics measurements. For example, the spectrum of the graphene quantum dots changes significantly when the edges of the graphene crystallites are chemically changed. Comparing the measured spectra to theoretical predictions gives the researchers confidence that they understand the size, shape and composition of their target samples.

Featured Paper/ Publication: [Single photon emission from graphene quantum dots at room temperature](#), Nature Communications, 2018

Reference Lab: [Jean-Sebastien Lauret](#), Nature Communications, 2018

Products used: [SpectraPro](#), [Pylon](#)