

Friday October 9<sup>th</sup> 2020- 10h 00

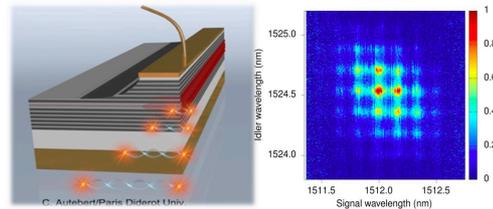
# “Generation and manipulation of quantum states of light with AlGaAs chips”

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The development of miniaturized devices for the generation and manipulation of entangled states of light is one of the key issues on the way towards a broad diffusion of quantum information technologies. Different platforms are currently under study and, among them, semiconductors present a strong case for integrability; in this context, AlGaAs is particularly attractive to monolithically integrate active and passive components thanks to its compliance with electrical injection and to manipulate quantum photonic states via its large electro-optic effect. In this seminar, I will review our main results on the generation of quantum states of light with AlGaAs devices operating at room temperature and telecom wavelength and I will present our recent work on the generation and manipulation of high dimensional quantum frequency states of light opening promising perspectives for quantum simulations and computing.



Left : sketch of a twin photon emitting laser diode ; Right : joint spectral intensity of a high-dimensional state



**Sara Ducci** is professor at Université de Paris and member of the Laboratory « Matériaux et Phénomènes Quantiques ». She received her PhD in Physics at the University of Florence (Italy) in 2000, with a work on pattern formation in nonlinear optical systems. After a postdoctoral position at Laboratoire Kastler Brossel and a position as temporary assistant professor at Ecole Normale Supérieure de Cachan, she joined the University Paris Diderot in 2002. Her research focuses on the development of semiconductor sources of quantum states of light operating at room temperature and telecom wavelengths; the work ranges from device development to fundamental quantum optics and applications in quantum information. She has been awarded the Louis Ancel Prize of the French Physical Society in 2016 and she is honorary member of the Institut Universitaire de France.

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