Biography
I graduated from the University of Trento, Italy, in 2015, with a Master in nanophotonics. For the final project, I spent six months at the ETH, Zurich, in the Quantum Photonics group led by Prof Atac Imamoglu, where I performed time resolved optical spectroscopy on single GaAs self assembled quantum dots. I moved to Cardiff University in July 2015 to pursue a PhD in the Biophotonics and Quantum Optoelectronics group led by Prof Wolfgang Langbein. Here I worked on four-wave mixing optical spectroscopy on single-layered transition metal dichalcogenides and various semiconductor heterostructures, including quantum dots embedded in photonic crystal waveguides, pyramidal quantum dots grown by metal-organic vapour phase epitaxy and colloidal quantum dots. In September 2019 I joined the Quantum Materials and Applications group led by A/Prof Thomas Volz, to investigate on single-photon interactions, using semiconducor exciton-polaritons strongly confined in fiber-based open microcavities.

My area of expertise includes coherent light-matter interaction, optical spectroscopy, quantum optics, solid-state physics, cryogenic, lasers.

Qualifications
Optical spectroscopy of excitons confined in two-dimensional materials and semiconductor heterostructures, PhD
1 Jul 2015 → 12 Mar 2019
Award Date: 12 Jun 2019
Nanophotonics, Master , Time-resolved optical studies on a single self-assembled quantum dot
1 Oct 2012 → 25 Mar 2015
Award Date: 25 Mar 2015
Physics, Bachelor Degree, Experimental characterization of interdigitated back contact solar cells
15 Sept 2009 → 15 Sept 2012
Award Date: 22 Jan 2013

Employment
Honorary Postdoctoral Fellow
Honorary Fellow
School of Mathematical and Physical Sciences
Macquarie University
1 Oct 2022 → present

Postdoctoral researcher
Cardiff Univ, Cardiff University, Sch Phys & Astron
Cardiff
1 Mar 2019 → 1 May 2019

Research outputs
Coherent dynamics of resonantly excited excitons in monolayers of transition metal dichalcogenides
Jakubczyk, T., Bartos, M., Scarpelli, L., Nogajewski, K., Langbein, W., Potemski, M. & Kasprzak, J., 27 Feb 2020, 
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Fine structure of nearly isotropic bright excitons in InP/ZnSec colloidal quantum dots
Brodu, A., Chandrasekaran, V., Scarpelli, L., Buhot, J., Masia, F., Ballottin, M. V., Severijnen, M., Tessier, M. D., Dupont,
D., Rabouw, F. T., Christianen, P. C. M., de Mello Donega, C., Vanmaekelbergh, D., Langbein, W. & Hens, Z., 19 Sept
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99% beta factor and directional coupling of quantum dots to fast light in photonic crystal waveguides determined by
spectral imaging
Scarpelli, L., Lang, B., Masia, F., Beggs, D. M., Muijarov, E. A., Young, A. B., Oulton, R., Kamp, M., Höfling, S.,
Schneider, C. & Langbein, W., 30 Jul 2019, In: Physical Review B: covering condensed matter and materials physics. 100
Coherence and density dynamics of excitons in a single-layer MoS$_2$ reaching the homogeneous limit
Jakubczyk, T., Nayak, G., Scarpelli, L., Liu, W-L., Dubey, S., Bendia, N., Marty, L., Taniguchi, T., Watanabe, K., Masia, F., Nogues, G., Coraux, J., Langbein, W., Renard, J., Bouchiat, V. & Kasprzak, J., 26 Mar 2019, In: ACS Nano. 13, 3, p. 3500-3511 12 p.

Propagation loss in photonic crystal waveguides embedding InAs/GaAs quantum dots determined by direct spectral imaging
Scarpelli, L., Lang, B., Masia, F., Beggs, D., Muljarov, E., Young, A. B., Oulton, R., Höfling, S., Schneider, C. & Langbein, W., 27 Feb 2019, Ultrafast Phenomena and Nanophotonics XXIII. Betz, M. & Elezzabi, A. Y. (eds.). Bellingham, Washington: SPIE, p. 1091617-1-1091617-8 8 p. 1091617. (Proceedings of SPIE; vol. 10916).

Long exciton dephasing time and coherent phonon coupling in CsPbBr$_2$Cl perovskite nanocrystals
Becker, M. A., Scarpelli, L., Nedelcu, G., Rainò, G., Masia, F., Borri, P., Stöferle, T., Kovalenko, M. V., Langbein, W. & Mahrt, R. F., 12 Dec 2018, In: Nano Letters. 18, 12, p. 7546-7551 6 p.

Resonantly excited exciton dynamics in two-dimensional MoSe$_2$ monolayers
Scarpelli, L., Masia, F., Alexeev, E. M., Withers, F., Tartakovskii, A. I., Novoselov, K. S. & Langbein, W., 15 Jul 2017, In: Physical Review B: covering condensed matter and materials physics. 96, 4, p. 045407-1-045407-11 11 p., 045407.

Awards

Projects