

Simone De Camillis

 simone.decamillis@anu.edu.au
 +61 (0) 444 582 176
 [sdecamillis.github.io](https://github.com/sdecamillis)
 linkedin.com/in/sdecamillis
 orcid.org/0000-0002-8823-9643

Professional Experience

Research Fellow

Jan 2021 – Present

Australian National University, Dep. of Material Physics (Supervisor: Prof. Adrian Sheppard)

Australian National University, Dep. of Quantum Science (Supervisor: Prof. Jong Chow)



- Designed and developed interferometric-based optical systems for volumetric imaging of crystals and 3D mapping of inclusions.
- Modelled imaging errors caused by opto-mechanical distortions and environmental instabilities. Developed suitable correction algorithms and standard calibration procedures.
- Coordinating optical R&D projects of the SmartLight team, ensuring alignment and effective communication with all stakeholders.
- Assessing system limitations and providing actionable recommendations for improvement.
- Conducting statistical analysis of data and targeted 3D data visualisation to evaluate performance.

Research Fellow

Jan 2019 – Jan 2021

Macquarie University (Supervisor: Em. Prof. Jim Piper)

ARC Centre of Excellence for Nanoscale BioPhotonics (cnbplegacy.org.au/imaging)



- Led research projects to analyse the optical properties of quantum dots and nanoparticles, enabling advances in super-resolution microscopy.
- Developed a bench-top free-space confocal microscope upgrading hardware and software components to support biomedical imaging applications.
- Conducted numerical studies to assess the feasibility of Non-Linear Structured Illumination Microscopy (NL-SIM) applied to lanthanide nanoparticles.

Instrumentation Engineer

Jan 2018 – Dec 2018

CEA Centre, Paris-Saclay, France (Supervisor: Dr. Olivier Boulade)



- Developed optical experiments to characterise the quantum efficiency and sub-pixel response of CMOS detectors for space applications.
- Designed and implemented numerical simulations of illumination patterns at the focal plane to guide experimental design.
- In collaboration with ESA (European Space Agency) and ONERA (The French Aerospace Lab).

R&D Engineer

Jan 2017 – Dec 2017

General Electric - Grid Solutions, Lisburn, UK (Supervisor: Dr. Chris Calvert)



- Researched and assessed new electro-optical solutions for gas detection to support and enhance GE products.
- Conducted experiments and data analysis to validate the performance and reliability of impedance sensors in measuring hydrocarbon concentrations.
- Designed and implemented a correction algorithm using field data, enhancing the accuracy and extending the lifespan of gas sensing detectors.

Skills

- Leadership**
- Management of the SmartLight optical laboratories.
 - Head researcher for projects on microscopy (Macquarie) and spectroscopy (QUB).
 - Representative of early career researchers within the CNBP Centre of Excellence.
- Instrumentation**
- Optics: Pulsed and continuous-wave lasers, polarisation control, harmonic generation, chirped pulse compensation, interferometry, spectral analysis, single-photon detection, fibre fusion splicing.
 - Imaging: confocal microscopy, optical-based super-resolution imaging, optical coherent tomography, transmission tomography, tunnelling electron microscopy.
 - Instrumentation for ultra-high vacuum and cryogenic conditions.
 - Analog/digital signal generation and processing.
- Programming**
- Simulations and data analysis: Python, MATLAB, C, Fortran, ImageJ, Paraview.
 - Control software: LabVIEW, Python.
 - Optical and mechanical design: OpticStudio Zemax, SolidEdge, SolidWorks.
 - Documents and planning: Jira, Confluence, Office, Latex.
 - Drawings: Inkscape, Blender.
- Communication**
- 15 peer-reviewed papers published in international journals (see ORCID profile).
 - 6 talk/poster presentations at international conferences.
 - Teaching the postgraduate class Advanced Imaging Methods and Systems (PHYS8721, ANU, 2021-2023).

Training and Schools

- Mar 2025 **Deep Learning for Image Classification** workshop delivered by the Queensland Cyber Infrastructure Foundation (QCIF).
- Feb-Apr 2024 **Online courses “Optical Efficiency and Resolution” and “Design of High-Performance Optical Systems”** delivered by Coursera (University of Colorado Boulder).
- Jun 2018 **School on visible and IR detection** at the Observatoire de Haute Provence, France. Instrumentation, detectors and data analysis for Astronomy and Astrophysics.
- Jan-Apr 2016 **Visiting Researcher** at the Institute of Photonics and Nanotechnologies, Milan, Italy. Project: “Ultrashort UV pulse production for next-generation pump-probe measurements”.

Grants and Awards

- Jan 2020 **Collaborative Seed grant** from Biophotonics Career Workshop at Swinburne University of Technology (AUD 2,500).
- Nov 2020 **Postdoctoral Fellowship** from CNBP Centre of Excellence at Macquarie University.
- Sep 2015 **Short-term Scientific Mission grant** from European COST Action (~AUD 4,100).
- Dec 2013 **Short-term Scientific Mission grant** from European COST Action (~AUD 4,000).

Education

Doctor of Philosophy (Ph.D.) in Optical Physics

Oct 2013 – June 2017

School of Mathematics and Physics, Queen’s University Belfast, UK (Supervisor: Dr. Jason Greenwood)

Thesis: “Ultrafast Dynamics in Gas-Phase Building Blocks of Life”

(pure.qub.ac.uk/en/studentTheses/ultrafast-dynamics-in-gas-phase-building-blocks-of-life).