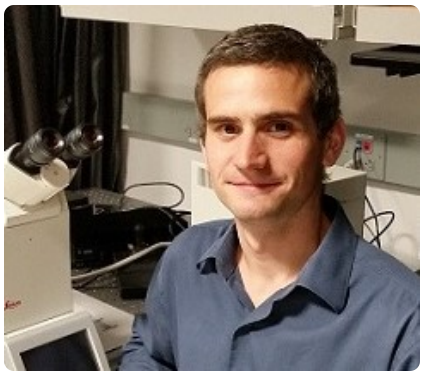
Alfred Millett-Sikking



Research & Development Engineer

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About

I'm a hybrid physicist and engineer who is fascinated by the notion of optimal designs. I've spent my career assembling experience in applied physics, optics, mechanics, electronics, programming and microscopy. I seek to improve technologies, and invent new ones, with element and system level innovations.

Key Skills

- R&D Engineering
- Design, Build & Test
- Optics (Zemax)
- Mechanics (Solidworks)
- Programming (Python)
- Microscope design

Experience

Calico Life Sciences LLC

2021 - 2024: **Senior Engineer**

I invented a novel technique to image 3D samples of any refractive index at high resolution using an immersion objective of any type[Millett-Sikking 2023]. This new 'any immersion remote refocus' (AIRR) microscopy method is particularly powerful when using a high numerical aperture air objective to image into 3D biological samples[Millett-Sikking 2022]. I then applied the AIRR technology to design and build a state of the art, large field of view, single-objective light-sheet (SOLS) microscope at Calico, and continued to collaborate with SOLS builders (Snoutclub) on many projects[Sommernes 2024, Bodén 2024].

2020 - 2021: **Scientist II**

The main drive of this period was to produce a user level SOLS microscope for Calico. In practice this meant developing device adaptors, instrument control and data processing software, and well as build and alignment procedures to get good PSF data. This naturally led to training users and early biological applications [Okreglak 2023].

2018 - 2020: **Scientist**

Initially I developed a series of custom ASI microscopes for 'The Yeast Lifespan' project at Calico[Thayer 2022]. This was followed by a major breakthrough when I designed a new kind of objective lens, the 'AMS-AGY' objective (a.k.a 'Snouty'), that revolutionized light-sheet microscopy [Millett-Sikking 2019, Riolka 2019, Millett-Sikking 2020]. The new "single-objective light-sheet" (SOLS) architecture is inherently fast, gentle, 3D and compatible with standard samples, making it a versatile and valuable technology [Sapoznik 2020, Millett-Sikking 2020]. This platform was then extended to larger fields of view[Yang 2022, Chen 2022].

2015 - 2018: **Senior Research Associate**

As a founding member of the York lab, I developed the original microscopy core and technology labs at Calico. In particular I designed and built a novel fast focusing module for a Leica microscope using Nikon remote refocus (RR) optics [Millett-Sikking 2018].

VisiTech International Ltd

2013 - 2015: **Research & Development Engineer**

Lead engineer in the development of multipoint laser scanning confocal microscopes (VT-Infinity). Including the full opto-mechanical design of a new super-resolution imaging system [York 2013] that was taken from concept stage to final product (VT-iSIM).

Department of Physics, Durham University

2011 - 2012: **Postgraduate Research Associate**

The first year of a PhD with the Quantum Light and Matter (QLM) group. I built and tested various intricate optical systems and completed the postgraduate courses.

Education

Durham University

2002 - 2006: **MSci Physics**

1st Class Honours and D. A. Wright Prize for best research project[Millett-Sikking 2006]. (Physics, Maths, Theoretical Physics, Experimental Physics, Mathematical Methods, Condensed Matter Physics, Astronomy, Electronics, Atomic & Optical Physics)

Other

Keen climber, hiker, camper, cyclist and general outdoor enthusiast. Fluent in Spanish.