

Quantum Multi-Modal Microscopy—QM³

Consortium Principal Investigators

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 [6] **Michel Antolovic** and **Harald Homulle**, PI Imaging Technology

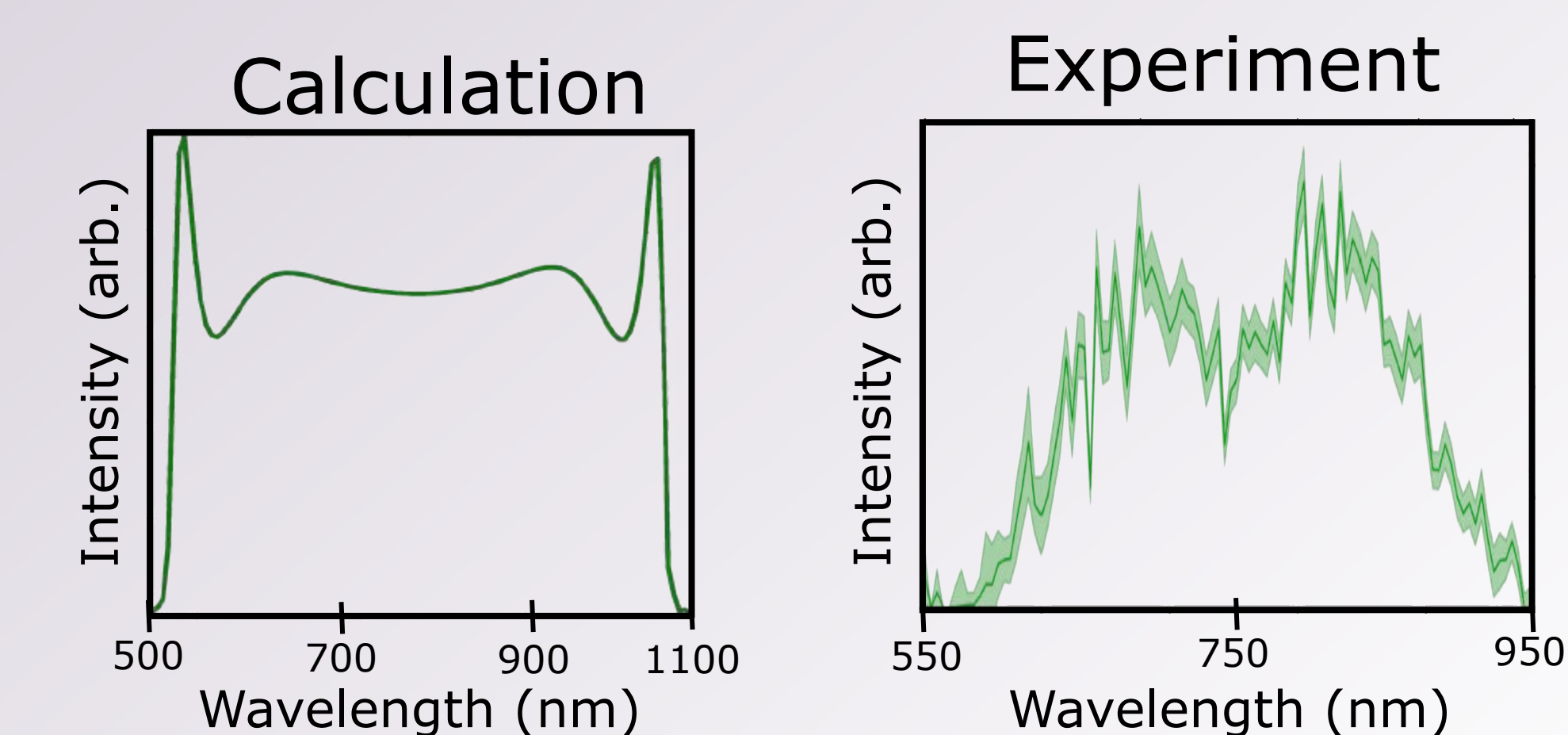
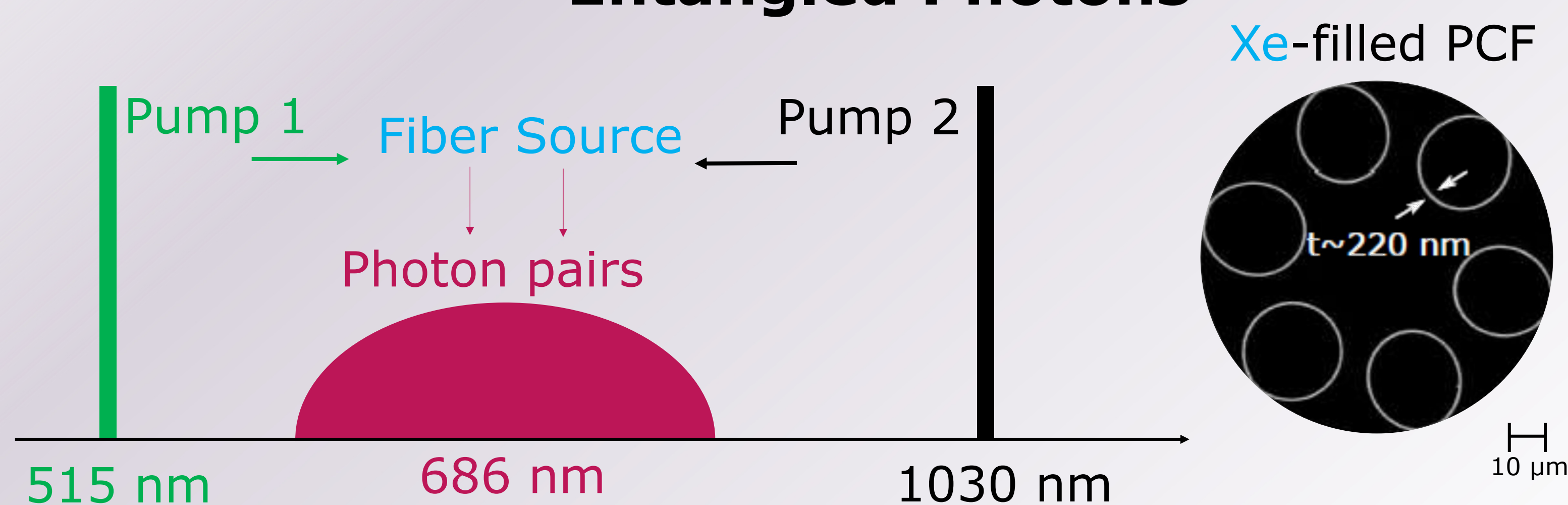
Presenter

[4] **Andrew Voitiv**, LKB

**Strategic Conference:
Impact of QuantERA
2016-2026**

Q-Source

[3] Engineered Broadband Entangled Photons



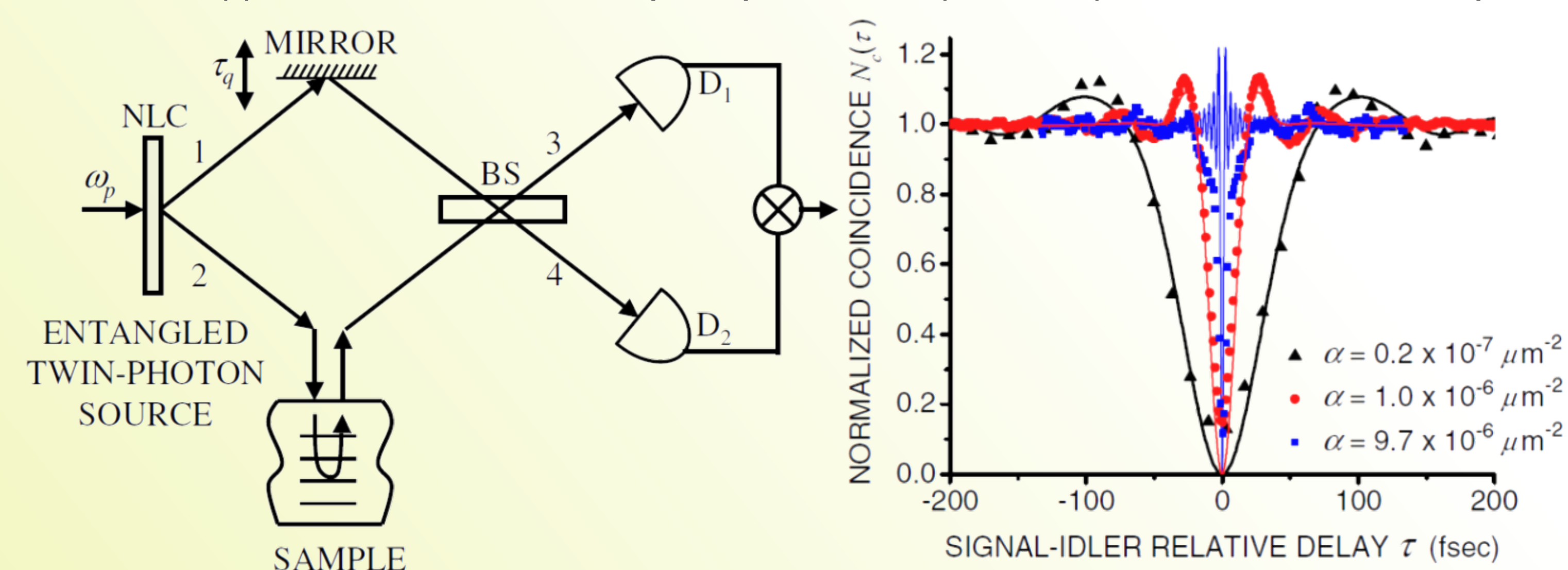
Wavelengths suitable for visible light SPAD arrays [2, 6]

Broadband pair-source for high depth resolution, $\approx 1 \mu\text{m}$, in Quantum Optical Coherence Tomography (Q-OCT)

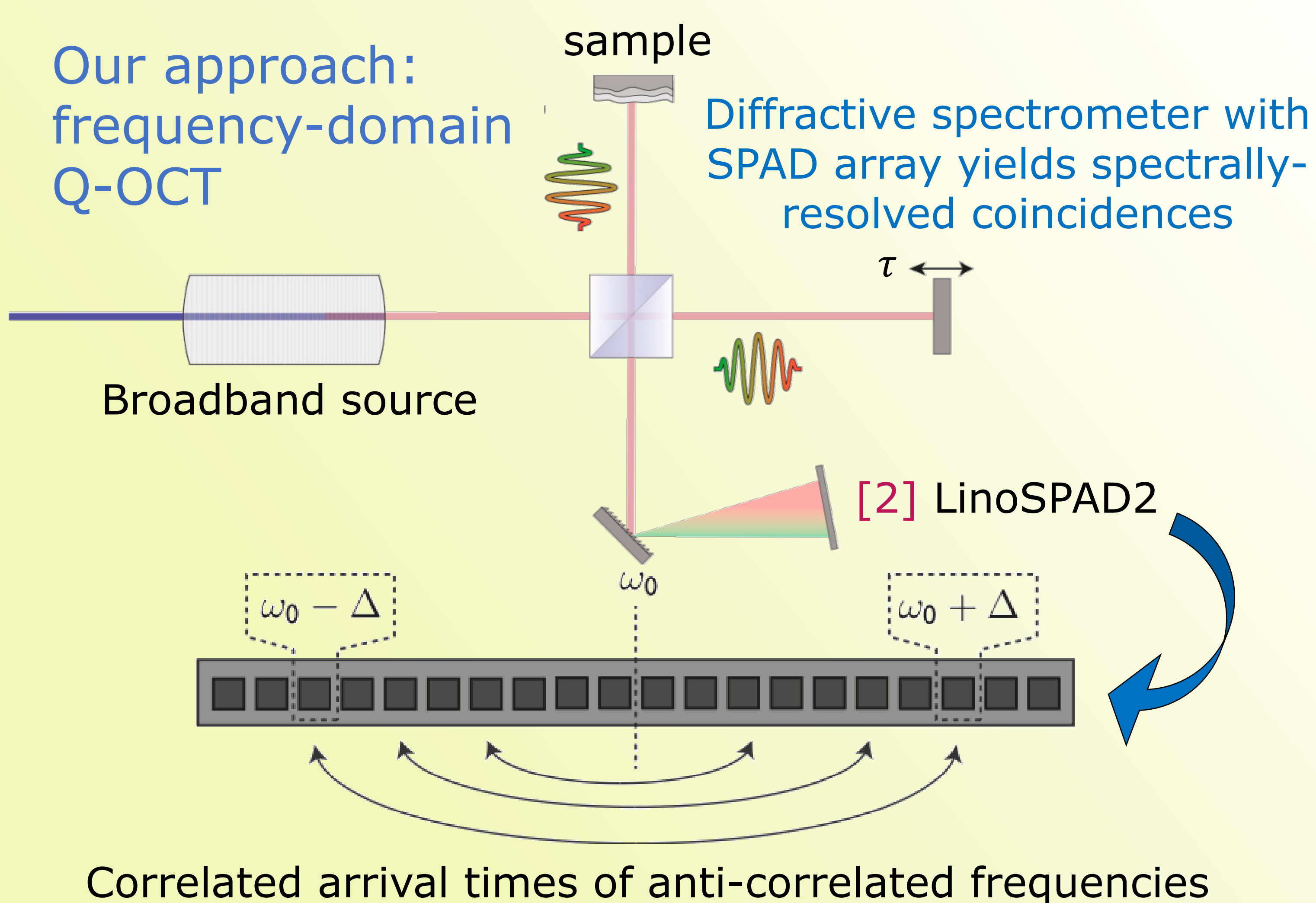
Q-OCT

[5] High Resolution Depth Imaging

Canonical Approach, *PRL* 91,083601 (2003) HOM Dips for Depth, *PRL* 100,183601 (2008)



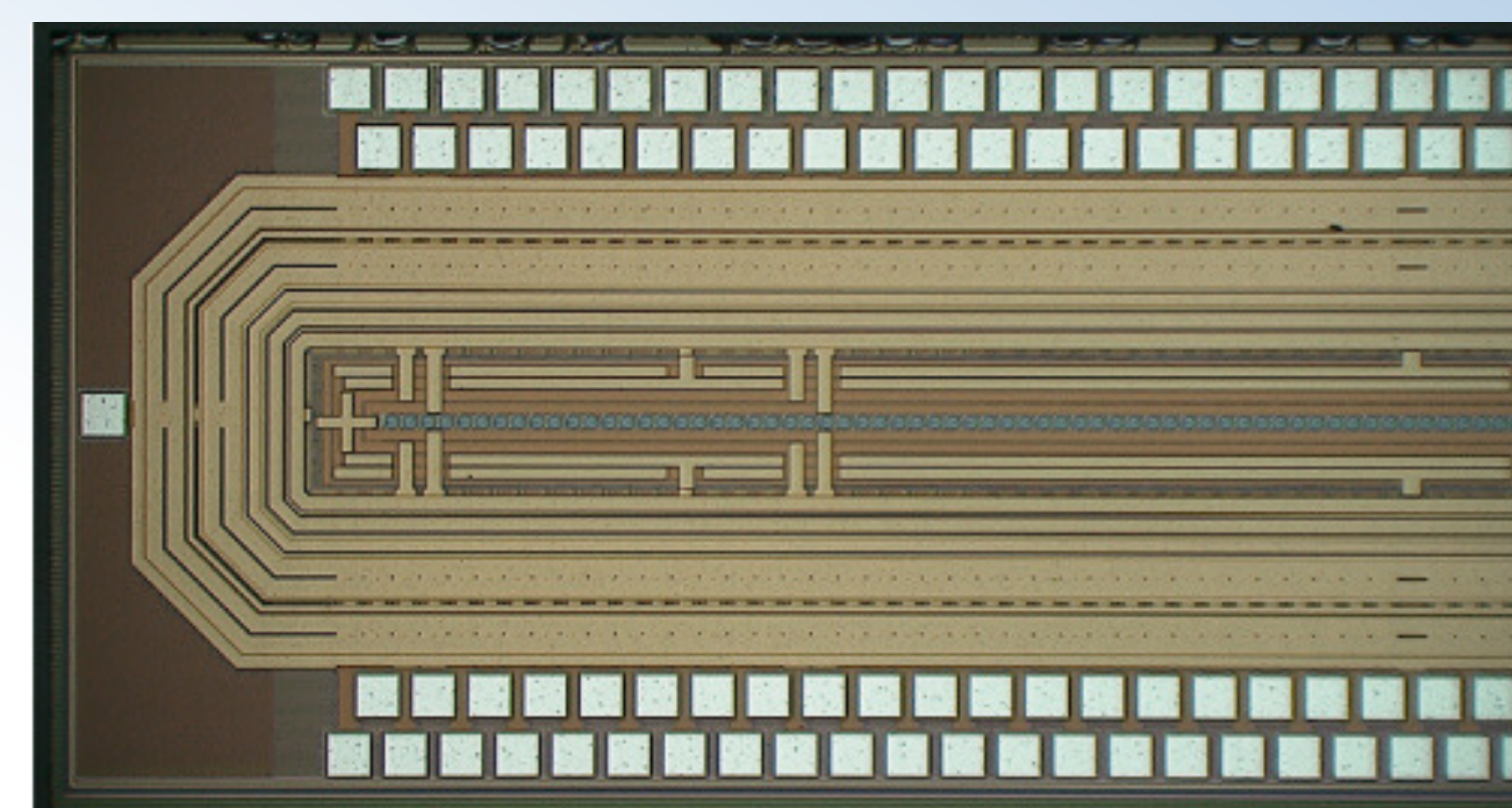
Our approach:
frequency-domain
Q-OCT



State-of-the-art Photon Detectors

[2] LinoSPAD2

512 detectors, each 100 ps jitter (FWHM),
>50% photon detection probability at 532 nm



Q-Technology

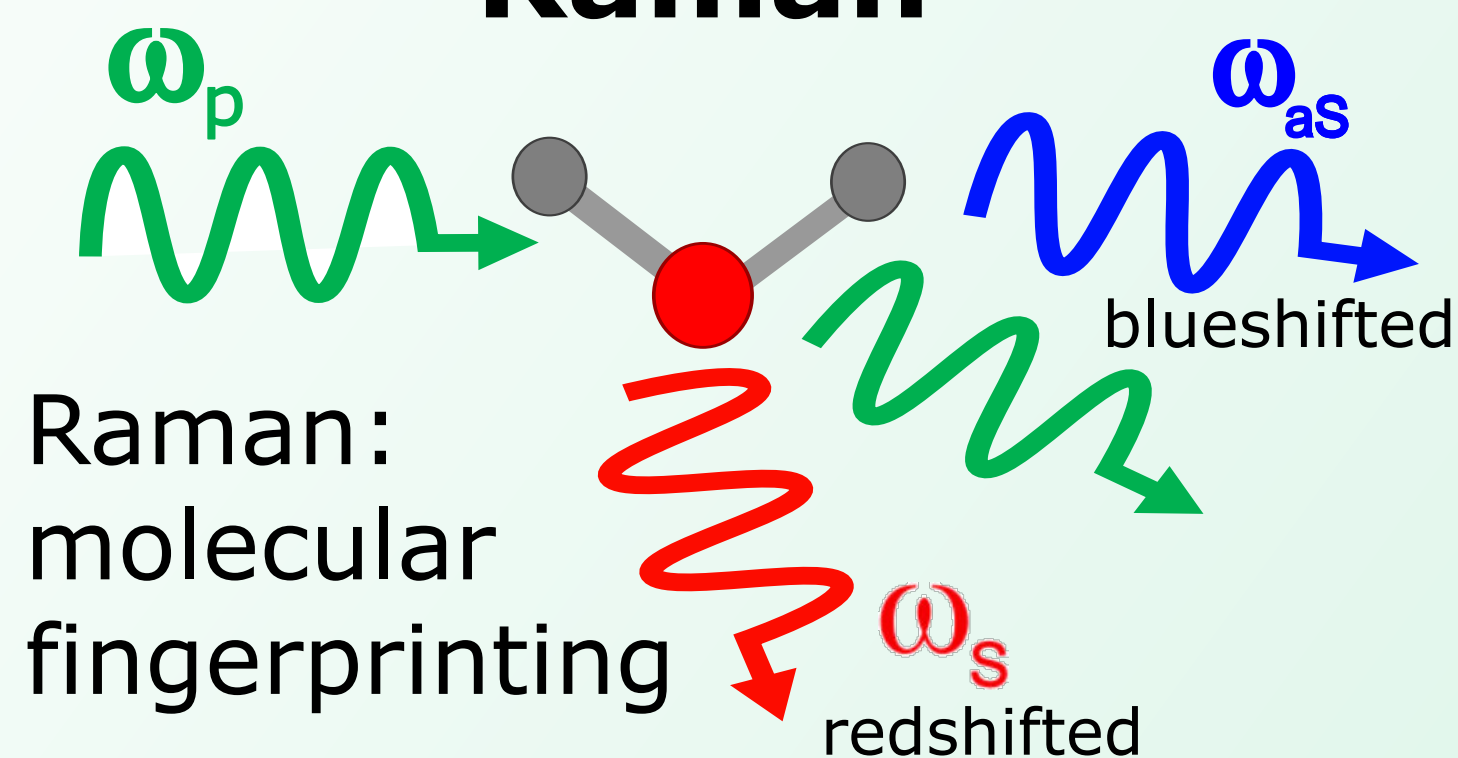


[6] **SPAD Lambda**
320 time-tagging detectors,
50% photon detection probability at 520 nm

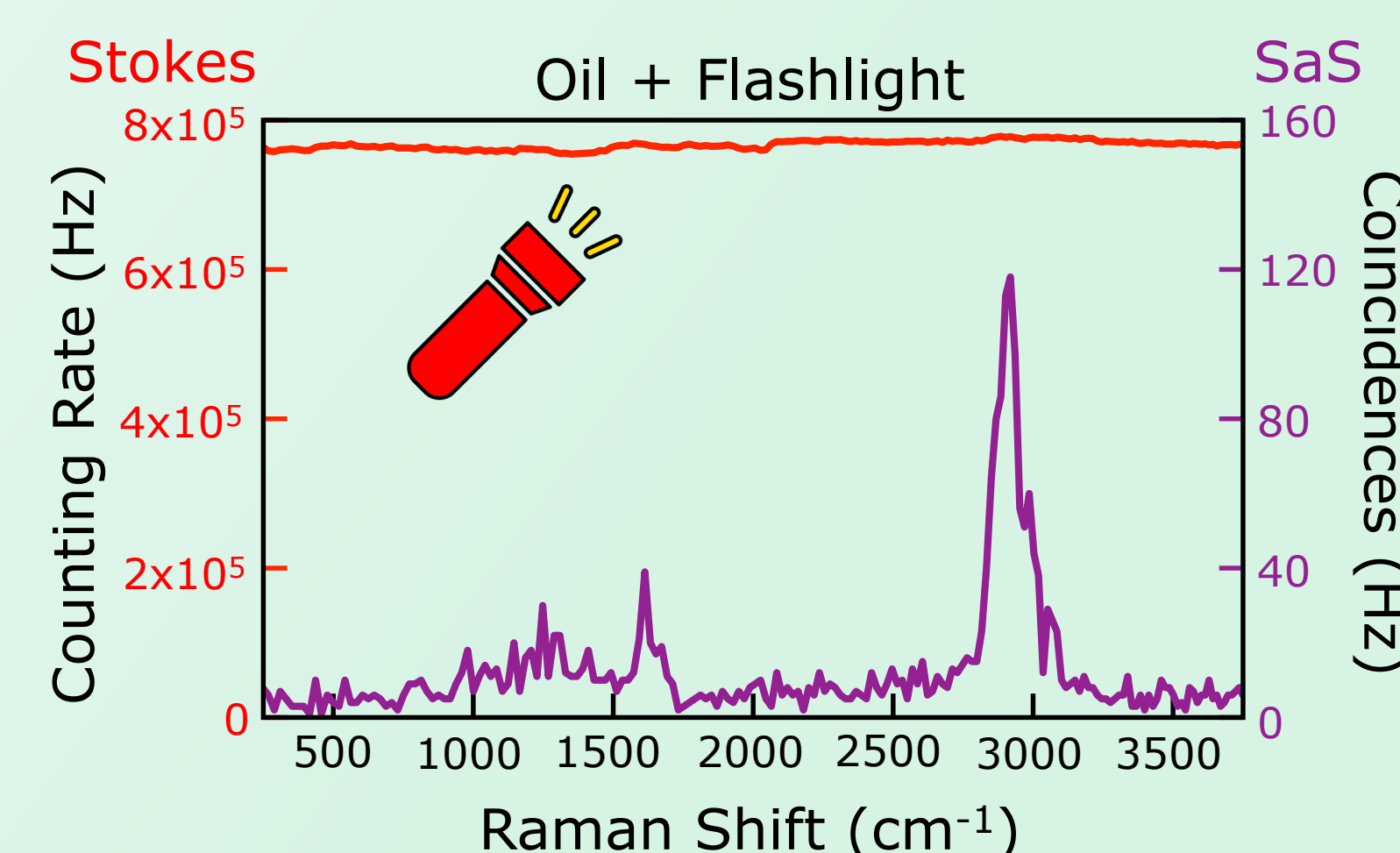
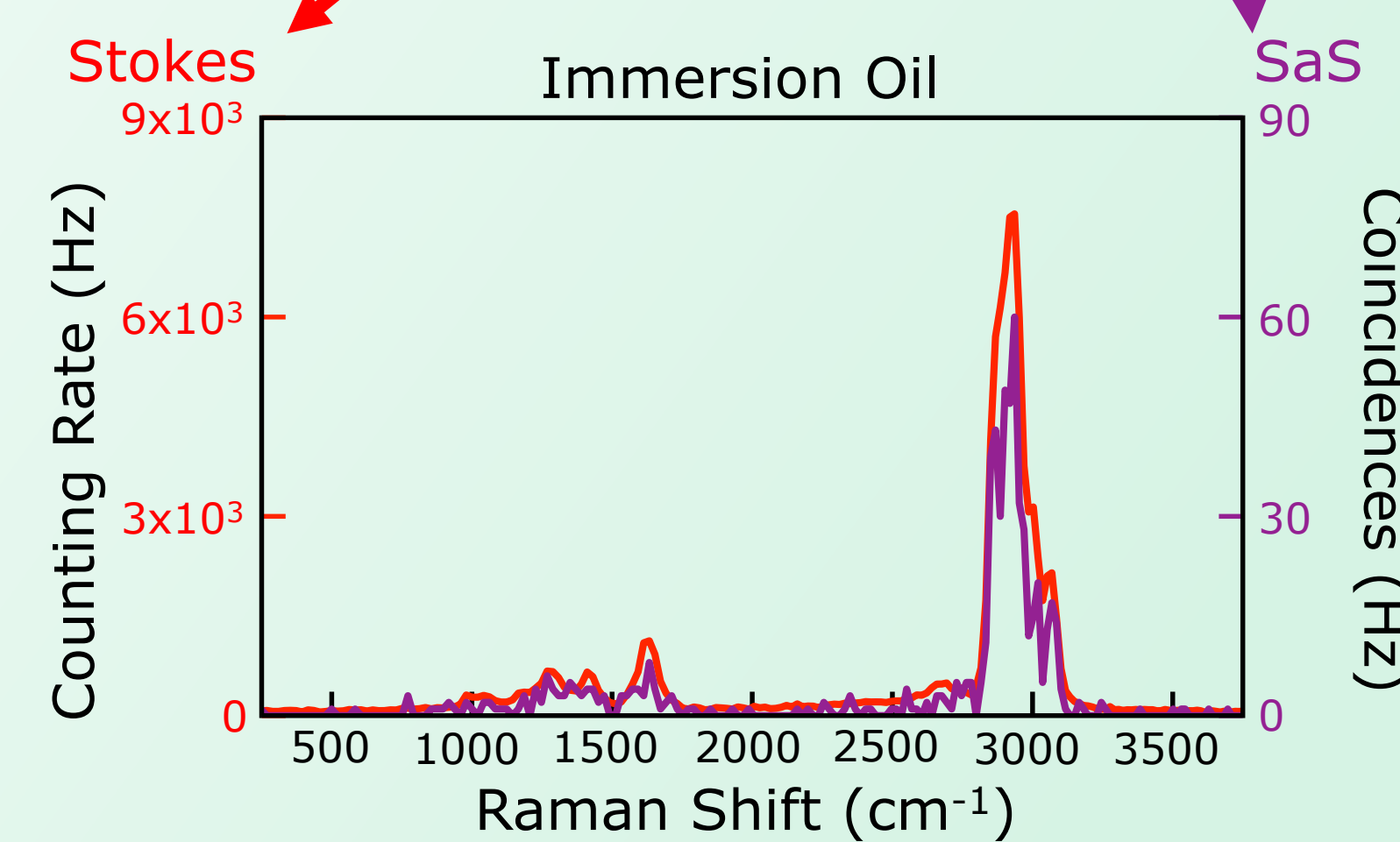
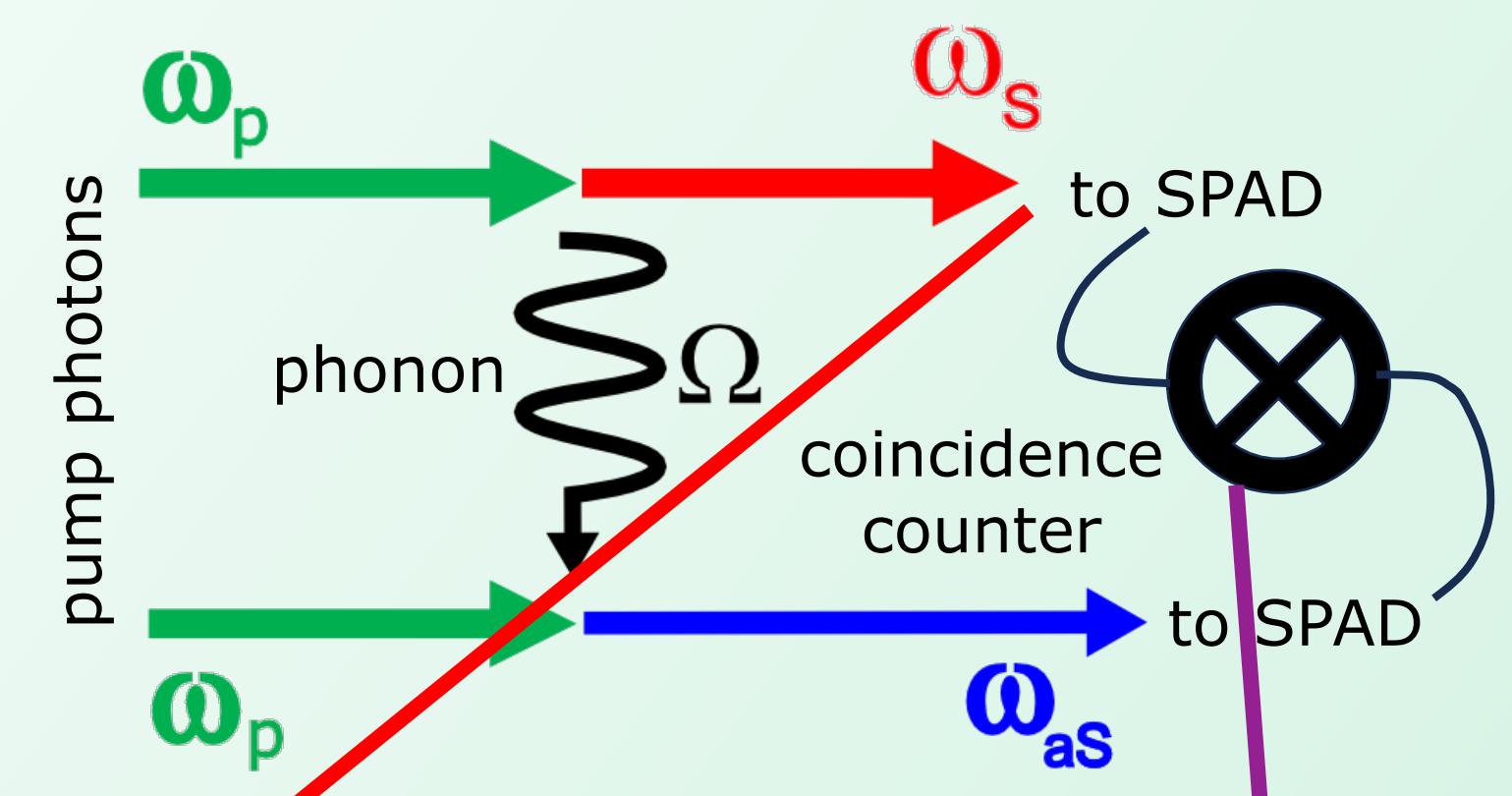


Q-Enhanced Chemical Imaging

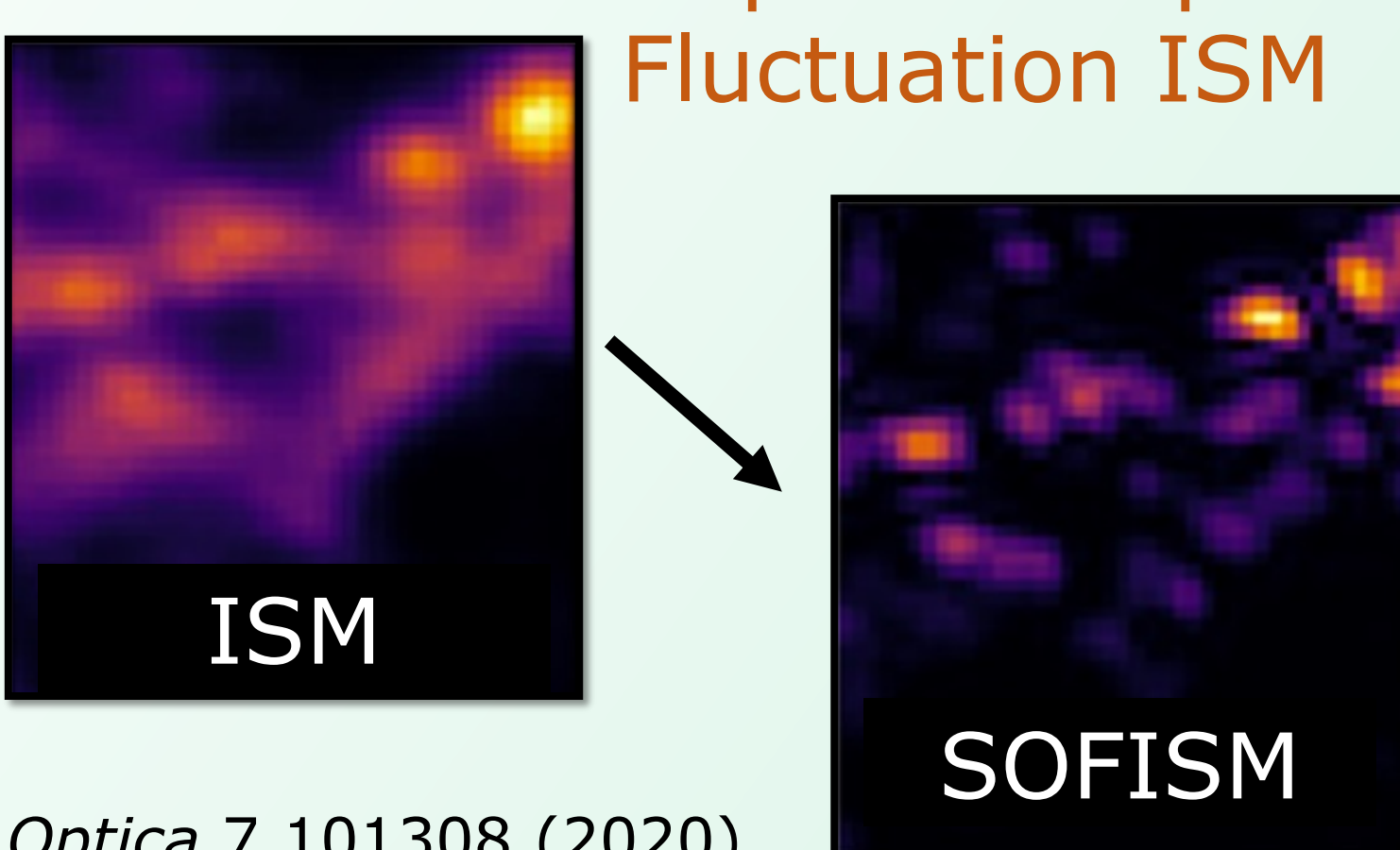
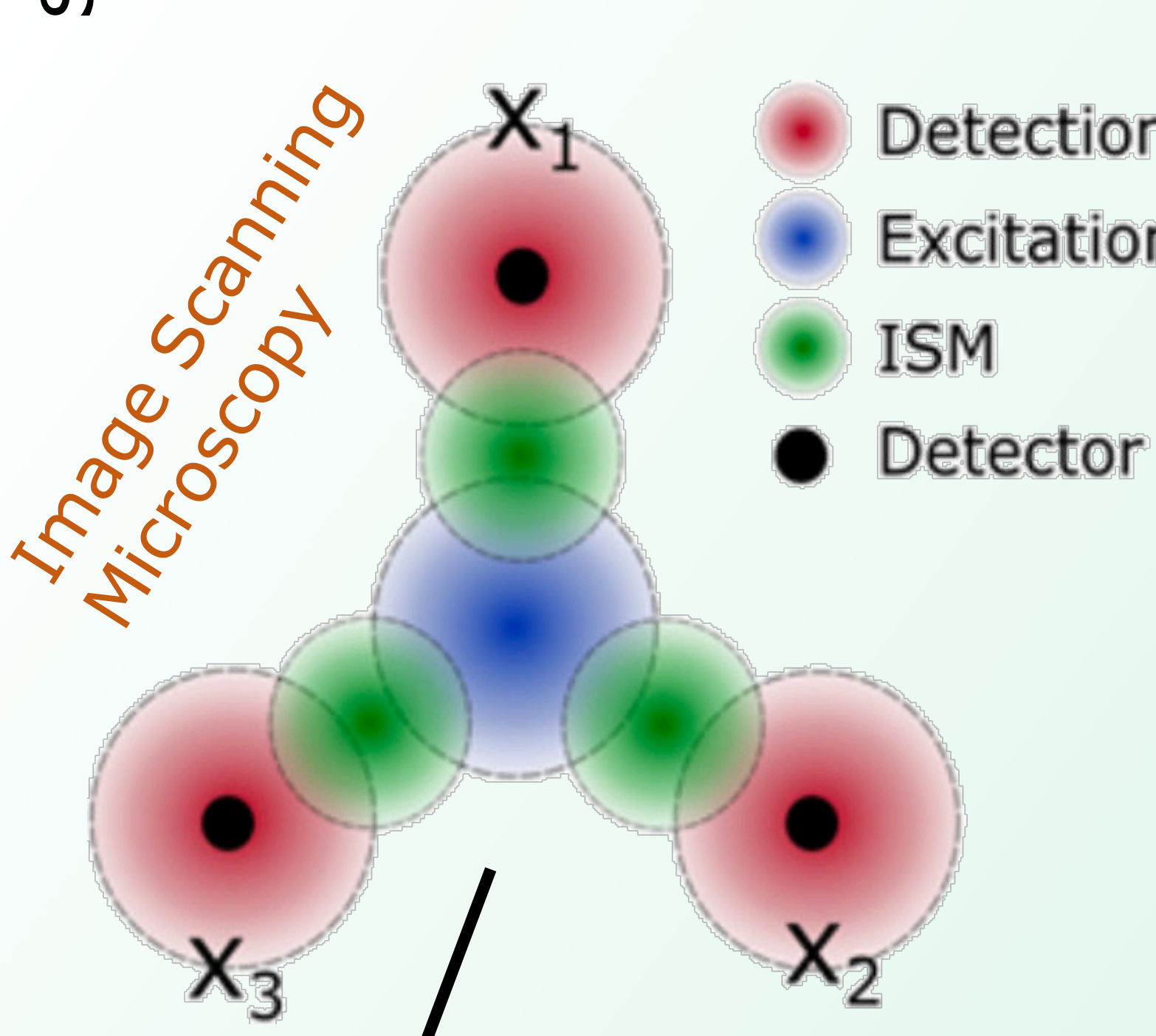
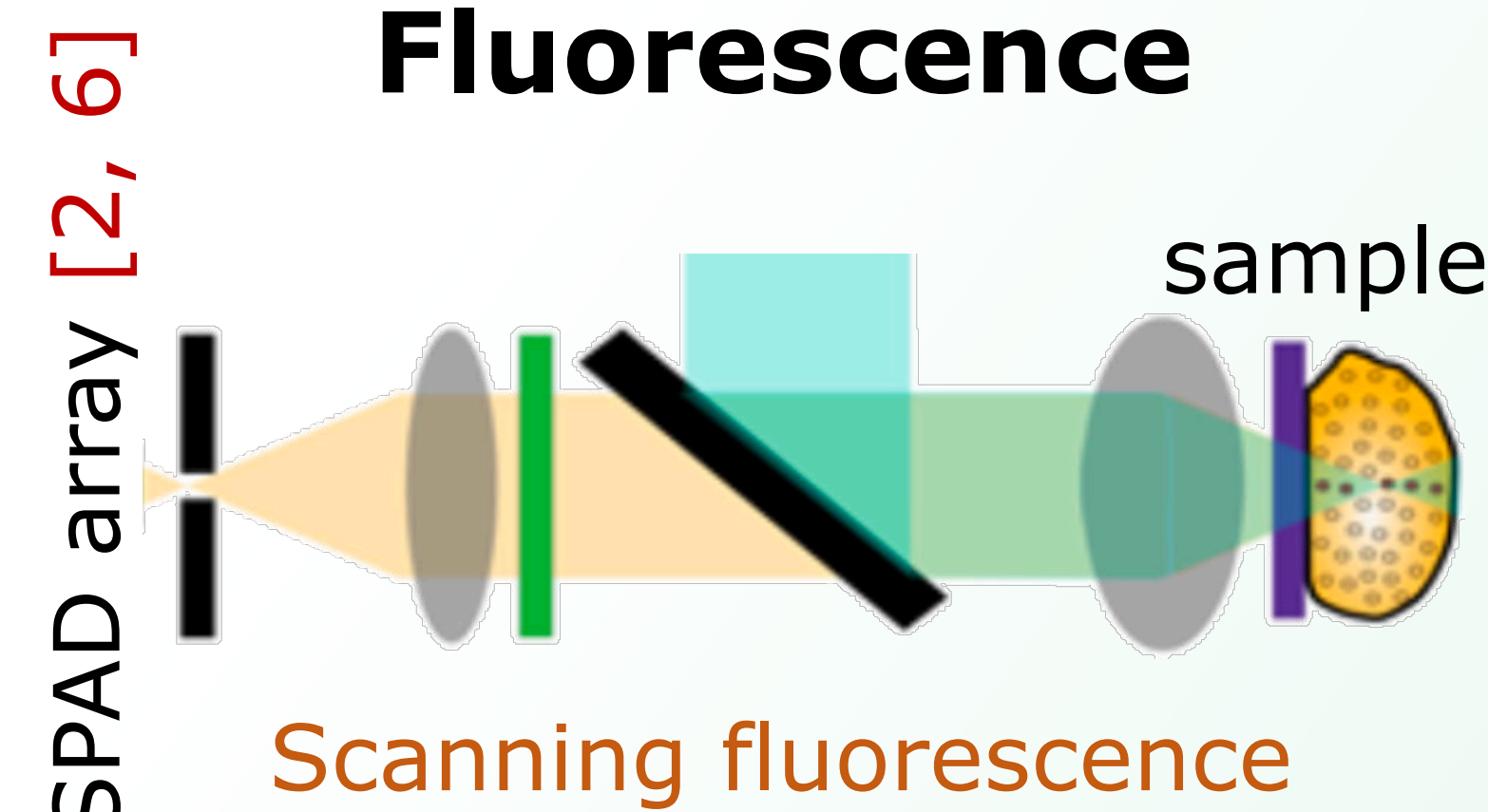
[4] Background-free Raman



Stokes (S)-antiStokes(aS)
shared vibrational quantum



[1] Super-res Fluorescence



Optica 7,101308 (2020)

Photon-photon correlation measurements