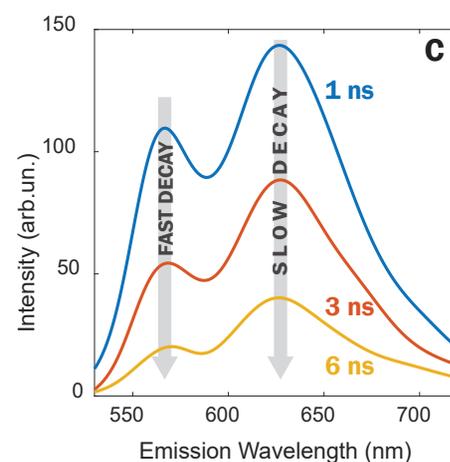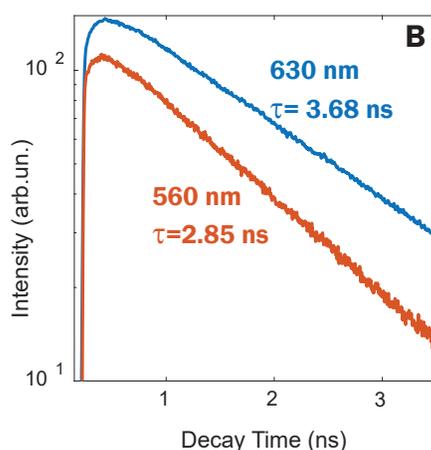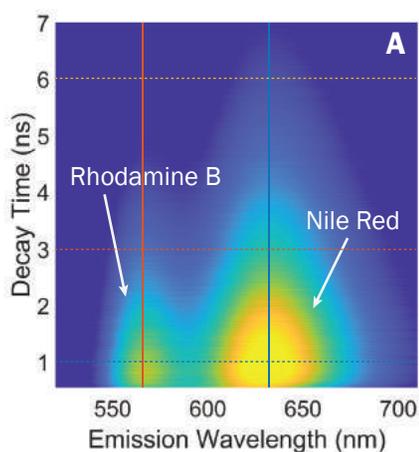# TIME- AND FREQUENCY- RESOLVED FLUORESCENCE MADE EASY

Add GEMINI Interferometer in between the sample and the detector to easily retrieve the SPECTRUM of your signal.
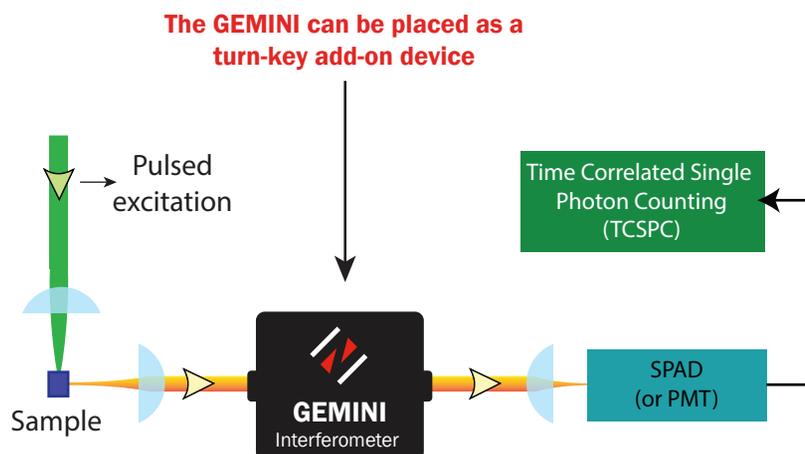
Key Benefits

- High **throughput** that allows high sensitivities
- **User-friendly software**
- **Variable spectral resolution** (without affecting throughput)

- Exceptional **stability** and insensitive to vibrations
- **Compact, lightweight** and **turn-key**
- **Broadband** spectral coverage (UV to SWIR)

Measurement Example

A: Fluorescence Map of a sample (mixture of Rhodamine B + Nile Red in Ethanol) as a function of Emission Wavelength and Decay Time. **B:** Dynamics corresponding to vertical cuts in (A). **C:** Spectra corresponding to horizontal cuts in (A).

Time- and frequency-resolved fluorescence with a single-pixel detector and a TCSPC module

The GEMINI can be placed as a turn-key add-on device

Pulsed excitation

Sample

GEMINI Interferometer

Time Correlated Single Photon Counting (TCSPC)

SPAD (or PMT)

Experimental Setup for Time- and Frequency-resolved fluorescence

GEMINI provides the **SPECTRAL** resolution
TCSPC provides the **TEMPORAL** resolution

Sensitivity Test

- Datapoints
- ⋯⋯ Linear Fit

SNR=2

Background

Counts/second vs Concentration (M)
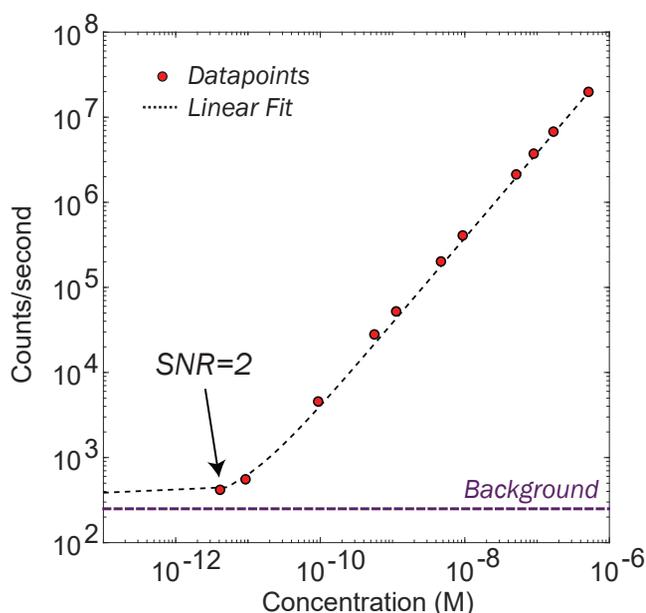
Measurements at different concentrations of the sample have been performed (red dots).

*The outstanding sensitivity of the system enables to reach **picoMolar concentrations.***

Excitation Power: 275 µW @ 532 nm wavelength

Sample: Mixture of Rhodamine B and Nile Red in Ethanol

Spectral Resolution

Valid for asymmetric versions

Spectral Resolution (nm) vs Wavelength (nm)

- L version
- M version
- S version
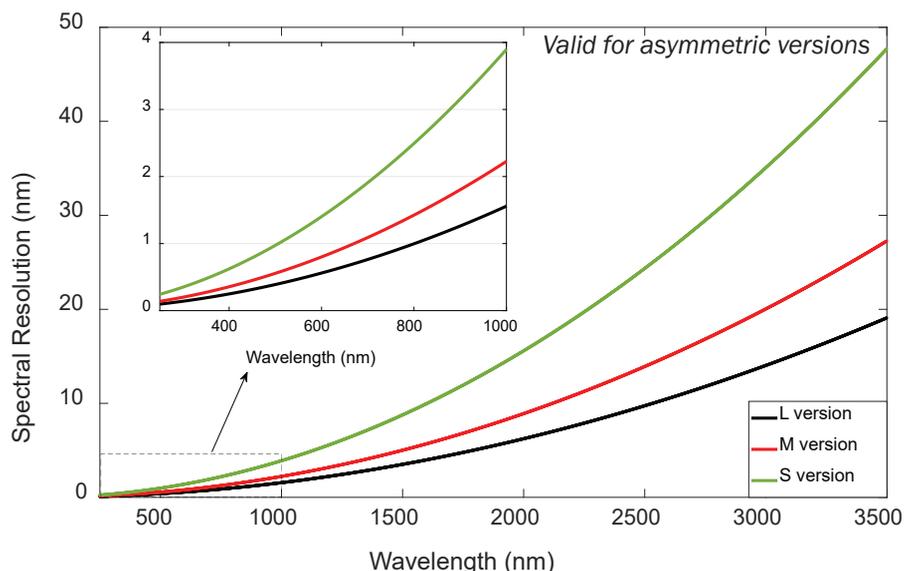
Other Applications

- Interferometry
- Generation of pulse pairs

GEMINI IN DETECTION PATH
- Time- and frequency- resolved fluorescence
- Pump-probe spectroscopy
- Coherent Raman spectroscopy

GEMINI IN EXCITATION PATH
- Fluorescence Excitation-Emission Map
- Characterization of single molecules

Perri *et al.*, Opt. Express 26, 2270-2279 (2018)