Technical Specification

1. Macro Measurements
   Four position rotational sample changer.

2. Micro Measurements
   2.1. Highest spatial resolution of Micro-measurements – 1 micron (0.2 micron pinhole and x 100 objective).
   2.2. Fluorescence mapping – smallest step 1 micron.

3. Steady-state Macro- and Micro-measurements:
   3.1. Excitation wavelength range 230 nm up to 1000 nm using Xenon CW lamp.
   3.2. Emission wavelength range 230 – 1700 nm.
   3.3. Spectral resolution 0.1 nm.

4. Steady-state and time domain anisotropy measurements (Micro- and Macro-)
   4.1. Choice of any excitation-emission wavelengths as in 3.1, 3.2.
   4.2. Anisotropy and anisotropy decay measurements for any angular position of Glen-Thompson polarizes with 0.1 degree steps.

5. Time-resolved measurements (Micro- and Macro-)
   5.1. Choice of any excitation-emission wavelengths as in 3.1, 3.2. Optional 532 nm laser excitation.
   5.2. Lifetime measurements accuracy - 1 picoseconds. Lowest detectable lifetimes - picoseconds.
   5.3. Measurement range for lifetimes acquired in Frequency Domain ps to ns, milliseconds range available in Time Domain (Xe flash lamp as an excitation source).

6. Software modeling capabilities
   On-line modeling of the phase and frequency response in the Frequency Domain using non-linear least-squares method to allow for:
   6.1. Lifetime heterogeneity – resolve lifetimes and contributions of various species.
   6.2. Distributed Fluorescence Decays – distribution of lifetimes in single sample.

Services
- Biomaterials qualitative and quantitative analysis, biomaterials interactions analysis.
- Flow cytometry labels analysis.
- Chemical analysis
- Materials macro and microcharacterisation and evaluation
- Forensic analysis
- Industrial contract research
- Instrument hourly rental.

Do you need spectroscopic characterisation at macro and microscopic level?

Macquarie University
Micro-Fluorolog-Tau3 Fluorescence Spectroscopy System

Optical Microcharacterisation Facility visit us at www.physics.mq.edu.au
What is Fluorescence Spectroscopy

This type of spectroscopy analyses light emitted by the specimen as a function of wavelength. Fluorescence can be used for a wide array of applications, including qualitative and quantitative measurements of the concentrations of molecules in a sample, monitoring changes in the structural and dynamic properties of molecules and molecular complexes. Fluorescence spectroscopic studies can be carried out at many levels ranging from simple measurement of:

- steady-state emission intensity
- steady-state anisotropy
to quite sophisticated:
- time-resolved intensity decay
- time-resolved anisotropy decay and
- excited-state reactions studies.

Selected examples of this utility include: study of physical properties of new fluorophores, intrinsic fluorescence from proteins, kinetics of light induced reactions, local and global molecular motion, size and shape. It can be used in analysis of new materials, environmental monitoring and as a diagnostic in biological, medical and forensic sciences.

The advantages of Micro-Fluorescence Steady and Time Resolved Spectroscopy

- Non destructive and non-intrusive analysis of even trace quantities of substances
- Broad range of excitation wavelengths.
- It provides steady-state excitation, emission characteristics, steady-state anisotropy information, lifetime measurements in time and frequency domain, time-resolved anisotropy decay as a unique parameters of molecules and their interactions with other molecules. Ability to distinguish between species with overlapping excitation / emission spectra based on difference in lifetimes.
- Allows study of fluorescence quenching, resonance energy transfer in relation to molecular structures, rotational dynamics and complexation in solutions and matrices.
- Mapping of inhomogeneous samples with micrometer spatial resolution.

Samples that can be examined

- We can examine samples of solids, liquids and gases with no sample preparation required.
- Measurements are done in air or in solution as prepared by customer (some dilution is often required to prevent detector saturation effects).
- For the lifetime measurements standard with close lifetime decay to the analyte specimen is required. Some standards especially for short lifetimes can be provided, others may require ordering.