

# Project Hazard Assessment



To be completed by the persons defining the work to be done e.g. Project Supervisor, board member etc. and sent to the Departmental Safety Officer before commencement of work.

**Supervisor**

Prof. Angus Bain

**Project Title**

A Critical Comparison of Time and Frequency Domain Measurements of Fluorescence Lifetimes

**Students Assigned**

Peter Ng, Qasim Bedford, Jessie Xu, Yiwen Shen, Zephyr Pang, Mithit Sangwan, Ezana Tedros, Yuan Cao, Gyan Dissanaïke, Dimitrios Filippidis, Shahab Firoozi, Haosong Li, Yuanzhen Zhao, Qinli Zhao

**Apart from normal laboratory hazards that are covered in the Departmental Code of Practice, will the work involve any of the following special hazards?**

**Yes/No**

|   |     |
|---|-----|
| 1. Radiation, high voltage, high pressure, ultrasound, LASERS, etc. | Yes |
| 2. Fire or explosion.   | No  |
| 3. Substances harmful to health.                                    | No  |

If your answers to questions 1-3 are all NO and you are satisfied with the following statement, you should sign and date below.

I have assessed the above project with respect to the Health and Safety Regulations as set out in the Departmental Safety Handbook and associated Safety Advisory Unit publications.

Signed

Date


If your answer to any of the questions 1-3 is YES, you must:

1. Discuss with relevant Safety Officer (Laser, Radiation, Electrical or Departmental) precautions to be taken before commencing the project.
2. Append a sheet giving details of the special hazards and explaining the precautions which you will take to protect the personnel involved and any other people such as College maintenance staff, cleaners or students who may enter the laboratory.

Sign and date below, having read the following statement.

I have notified the appropriate specialised Departmental Safety Officer of any work involving radiation, lasers, electrical, chemical, or other identified hazards and have taken precautions to protect personnel. I certify that the work will be carried out according to the Departmental Code of Practice and (if required) the further code that is appended, so that exposure to hazardous substances and other risks will be minimised. I undertake to review this assessment if the nature of the work should change, or if any unforeseen hazards should be encountered.

Signed

A handwritten signature in black ink, consisting of a stylized 'A' followed by a long horizontal stroke.

Date

15/02/2024

# Project Risk Assessment Form



**Project Title**

A Critical Comparison of Time and Frequency Domain Measurements of Fluorescence Lifetimes

**Location of Experiment**

UCL Department of Physics and Astronomy

**Description of Experiment**

Computational simulation and data analysis of Time-Correlated Single Photon Counting (TCSPC) and Phasor methods of fluorescence decay.  
The risk assessment covers a brief visit to the time resolved fluorescence facilities in Physics (F22) and Cell and Developmental Biology (Imaging Facility Med Sciences building) on 15/2/2024 supervised by Prof Bain and Dr Blacker. No experimental work is involved in either visit

**Lead Experimenter**

Prof. Angus Bain

**Other Persons Involved**

Dr Thomas Blacker

**Supervisor / Board Member**

Prof. Angus Bain

**Hazard Identification** (state the hazards involved in the work. Consider **Chemicals, Radiation, LASERS** (an additional assessment will also be needed), the **environment, equipment, manual handling, electrical equipment, fire and explosion, disposal of waste**)

1. Lasers (Class 4)
2. Heavy equipment
3. Electrical equipment

Risk Assessment (assess the risks involved in the work and state high, medium or low risk)

riskNET Incident 6 x 5 risk matrix

|          |   | Likelihood |  |          |        |         |
|----------|---|------------|--|----------|--------|---------|
|          |   | Remote     | Unlikely                                 | Possible | Likely | Certain |
| Severity | Non injury  | A          | A  | A        | A      | A       |
|          | Minor injury                                      | A          | A  | B        | B      | C       |
|          | Lost time injury, temporary disability or illness | A          | B  | C        | C      | D       |
|          | Permanent disability or major injury              | B          | C  | C        | D      | D       |
|          | Fatality, multiple serious injuries/illnesses     | C          | C  | D        | D      | D       |
|          | Multiple fatalities                               | C          | D  | D        | D      | D       |
|          |   | A          | Very Low Risk - Initial Assessment       |          |        |         |
|          |   | B          | Low Risk - Local Investigation           |          |        |         |
|          |   | C          | Medium Risk - Local/Full Investigation   |          |        |         |
|          |   | D          | High/Very High Risk - Full Investigation |          |        |         |

1. Eye damage, Likelihood: Remote, Severity: Minor to Major Injury, Low Risk
2. Trip hazard within the optical table area, injury due to equipment falling, Likelihood: Remote, Severity: Minor Injury, Very Low Risk
3. Electrocution, Likelihood: Remote, Severity: Minor Injury, Very Low Risk

**Control Measures** (say how you will reduce the risk to an acceptable level)

1. Outside the experimental area all class 4 laser beams are either fully enclosed or behind metal screens to prevent direct exposure. Within the experimental area the on-sample laser power levels were well below that of Class 4 output. At no time during the demonstration are the students to take on a hands-on role. The experimental procedures and photon counting measurements were undertaken by Dr Thomas Blacker. The students are to be given an introductory briefing on safety procedures applicable to a supervised laboratory visit.
2. Not to look directly at any laser output (protective eyewear would have been provided had high levels of Near infrared or visible light been present/accessible).
3. Not to touch any of the optical components on the optical table unless specifically asked by Prof. Bain or Dr. Blacker, all reflective items (e.g. watches rings and other jewellery) to be removed to prevent the escape of laser radiation due to inadvertent reflections from such items. Not to allow their heads to drop to a level compatible to the beam paths within the optical table.
4. All bags and coats to be removed on arrival and left in the outer laboratory area, no liquids (e.g., bottled water) to be brought into the experimental areas to prevent accidental spillages in the vicinity of live electronic equipment.
5. Do not touch (unless explicitly asked to) any equipment on or above the optical table and in the experimental area.

**Declaration**

I the undersigned have assessed the work, titled above, and declare that there is no significant risk / the risks will be controlled by the methods stated on this form and that the work will be carried out in accordance with Departmental codes of practice.

Assessor

Professor A. J. Bain

Signature



Date

15/02/2024

Supervisor/Board M

Professor A. J. Bain

Signature



Date

15/02/2024