

# Research, Informatics and Graduate Studies

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## Research Fellow in Fluorescence detected two-dimensional spectroscopy of molecules and molecular aggregates (RF-2021001) – Group of Asst. Prof. Khadga Jung Karki

The Physics Program (group of Asst. Prof. Khadga Jung Karki) is looking for 1 post-doctoral fellow to conduct experimental research in understanding the effects of electronic (and possibly vibrational) coherence on the fluorescence of molecules and molecular aggregates by using fluorescence detected two-dimensional spectroscopy.

### Project Details

Fluorescence detected two-dimensional spectroscopy is a powerful technique that can probe the effects of electronic and vibrational coherences in molecules and molecular aggregates on the external signals. As functionality of systems such as organic light emitting diodes or solar cells depend on the long lived external signals that include fluorescence and photocurrent, the technique provides a detailed information about the role of coherences on the functioning of the devices. In fact, this unique technique promises to initiate new directions in experiments which enable us to utilize quantum properties of matter in useful devices. However, some challenges in interpreting the results of the measurements have persisted. The main difficulty has been in isolating the nonlinear signals induced by the ultrafast coherences from other nonlinear signals contributed by long lived incoherent processes. A detailed theoretical analysis has shown that it is possible to differentiate the two types of signals by analyzing the phases. In this project, we aim to experimentally test the theoretical prediction and carry out detailed experiments on molecules and molecular aggregates that can be used in LEDs and solar cells.

### Keywords

Fluorescence detected two-dimensional spectroscopy, organic photovoltaics and light emitting diodes, femtosecond lasers, phase modulation.

### Selection Criteria

- PhD in physics or physical chemistry (essential).
- Experience in different forms of spectroscopy (essential).
- Familiarity with programming languages (c, c++ , matlab, python, etc. ) and proficient in one of them (essential).
- Ability to author scientific reports and papers (essential).
- Good communication skills and strong command of English (essential).
- Native Chinese speaker (preferable).
- Ability to work independently as well as in a team environment (essential).
- Ability to mentor PhD students (preferable).

### Program

Physics

### Research Area

Fluorescence detected two-dimensional spectroscopy of molecules and molecular aggregates

### Contact

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[Web Page Link](#)

### Application Deadline

Open till filled

### Date Posted

22 February 2021

### Location

Guangdong Technion – Israel Institute of Technology (GTIIT), China & Technion-Israel Institute of Technology, Israel.