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FACULTY OF SCIENCE & TECHNOLOGY

DEPARTMENT OF PHYSICS

SEMINAR SERIES: 2023/2024

Investigating the Transfer Efficiency of Quantum Light-Harvesting Systems.

Presenter: Mr. Ethan Wyke

Date: Friday 28th June, 2024

Time: 3:00 pm

Zoom Link:

https://sta-uwi-edu.zoom.us/j/97903601744?pwd=y0Jy2yatx5R9vVXSBbwvOLKHGHjIj4.1

DEPARTMENT OF PHYSICS- SEMINAR SERIES

Title: Investigating the Transfer Efficiency of Quantum Light-Harvesting Systems.

ABSTRACT

In a light-harvesting photosynthetic complex, incident light is absorbed by an antenna complex and transferred to a reaction centre, where that energy is utilized in the downstream chemical reactions of photosynthesis. We use a simplified model based on the LH1-RC photosynthetic complex to investigate the quantum mechanics of this energy transfer and the external factors that can potentially enhance or suppress the efficiency by which this incident light energy is transferred to the reaction centre.

These factors include, but are not limited to:

i. The presence of disorder in the system. In this analysis, a biological environment imposes statistical variations in chromophore energies and coupling strengths in the photosynthetic complex.

ii. The type of incident light that is incident on the system. In this analysis, light can be modelled as a classical pulse or a single-photon quantum state.