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FACULTY OF SCIENCE  
& TECHNOLOGY

# DEPARTMENT OF PHYSICS

SEMINAR SERIES: 2024/2025

## **Title: Energy Generation and Waste Treatment Using Indigenous Microorganisms Through Microbial fuel Cells**



Presenter: Mr. Miguel Andrews

Date: Thursday 10<sup>th</sup> October, 2024

Time: 10:00 am

Venue: DCIT Conference Room, 2<sup>nd</sup> floor  
Natural Sciences Building

### Zoom Link:

[https://sta-uwi-  
edu.zoom.us/j/92734660690?pwd=iaw7ozYPSv03fL8jfR  
93eIFtiPkeDp.1](https://sta-uwi-edu.zoom.us/j/92734660690?pwd=iaw7ozYPSv03fL8jfR93eIFtiPkeDp.1)

# DEPARTMENT OF PHYSICS- SEMINAR SERIES

## ABSTRACT

It was Albert Szent-Gyorgyi, M.D., who most notably coined the phrase "Water is life's matter and matrix, mother and medium. There is no life without water." All inter-governmental organizations agree that access to potable water will inevitably decline as a consequence of global warming. Given these considerations, addressing this issue in a sustainable manner is of grave significance to mankind. In addition, several studies have shown that wastewater contains at least five (5) times more latent energy than is needed to treat the aforementioned. As such, investigating and developing circular technologies that can reclaim this energy from wastewater is also of great interest. This research has two main goals: to identify Indigenous habitats where microorganisms that participate in the improvement of water quality exist and to explore ways to facilitate the co-generation of electricity through the use of microbial fuel cells. Wetlands provide one of the best environments for observing microbiological behavior. According to the Environmental Management Authority, the Caroni River is the largest habitat of this type in Trinidad and Tobago, which is why it is a key site for investigation. The research successfully identified two main areas for further study – the junction where the San Juan and Caroni Rivers meet and the Santa Cruz Rainforest. Both sites possessed microorganisms that demonstrated the ability to treat the water by reducing the Chemical Oxygen Demand (COD) of their substrates while generating electricity. Future studies shall investigate which microbiological species are present and how combining different species can be leveraged to optimize the rate of COD reduction and electricity generation for operating wastewater treatment facilities.

**Keywords:** Water, Microorganisms, Wetlands, Sustainability, Electricity, Wastewater Treatment, MFC, Caroni, Rainforest, COD