



2021 Virtual HBCU-UP/CREST PI-PD Meeting



Research Initiation Award: Structure-Property Relationships of Non-Fullerene Acceptors for Photovoltaic Applications

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All findings and opinions are those of the authors, not necessarily of the funding agency or AAAS



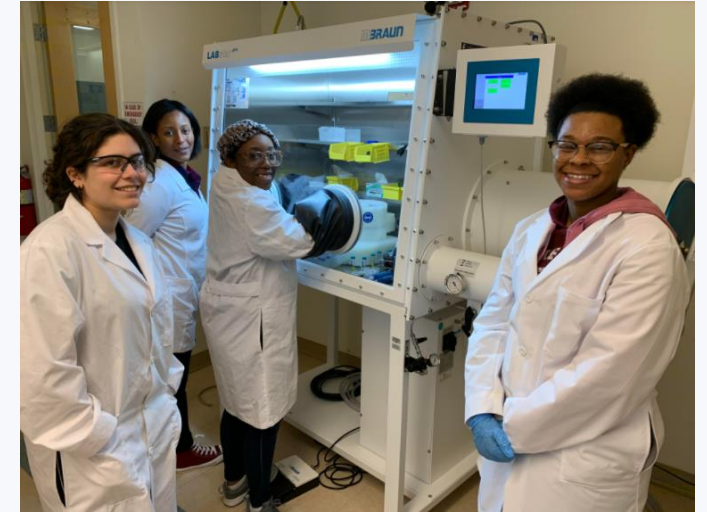
Project Overview

- To understand how the chemical structure of polymer donors and small molecule acceptors, and morphology of thin films influence the device functionality in photovoltaic structures so that they can be exploited to design structures with high efficiency.
- To investigate the impact of electronic coupling between the donors and acceptors within thin film on lifetime, dielectric response, mobility, disorder, and device efficiency.
- To promote STEM education by engaging underrepresented undergraduate students in research and scholarly activities.

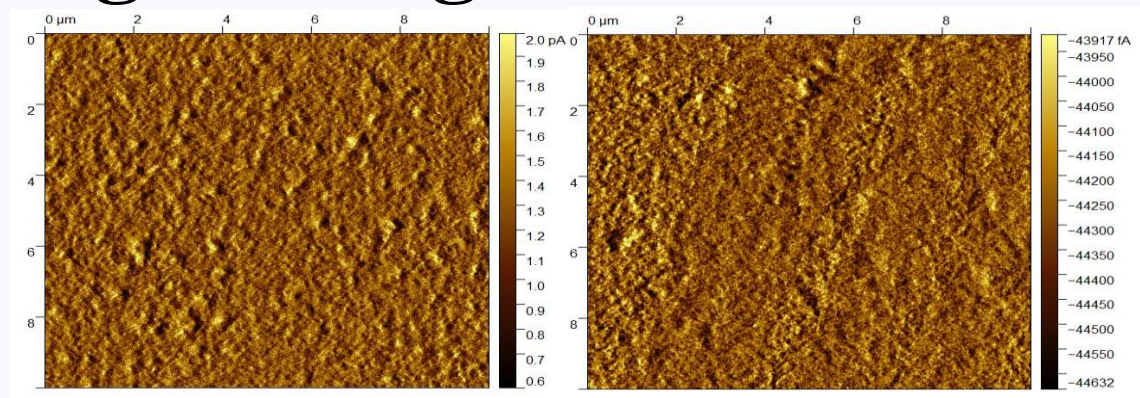
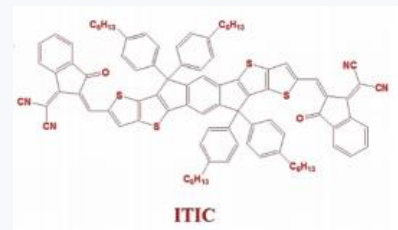
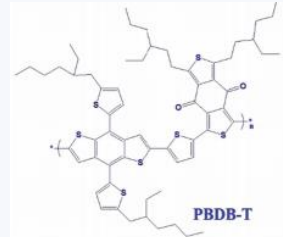
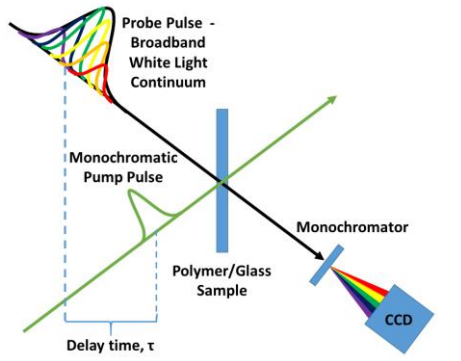


Best Practices/Successes

- Four students were involved for this research project, three were female and all of them were minority students. Two students presented their research work at 2020 Emerging National Research National (ERN) conference at Washington DC.
- PI organized Local Science Teacher's Workshop in January and February 2020 to promote science in high school.
- One paper is entitled "Morphological Characterization of Polymer Blends: Impact of Side Chain Modification " published in Microscopy and Microanalysis.

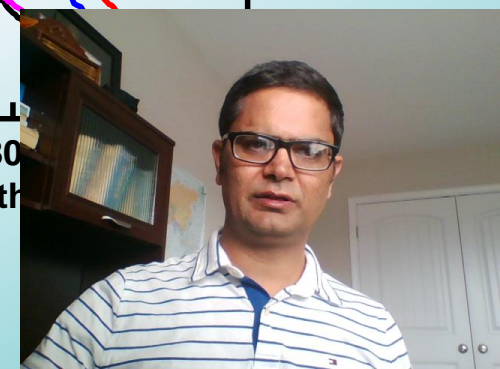
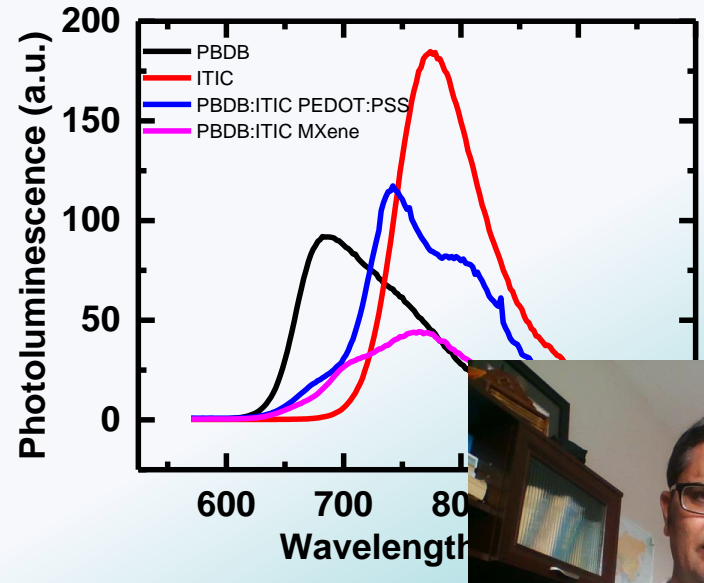
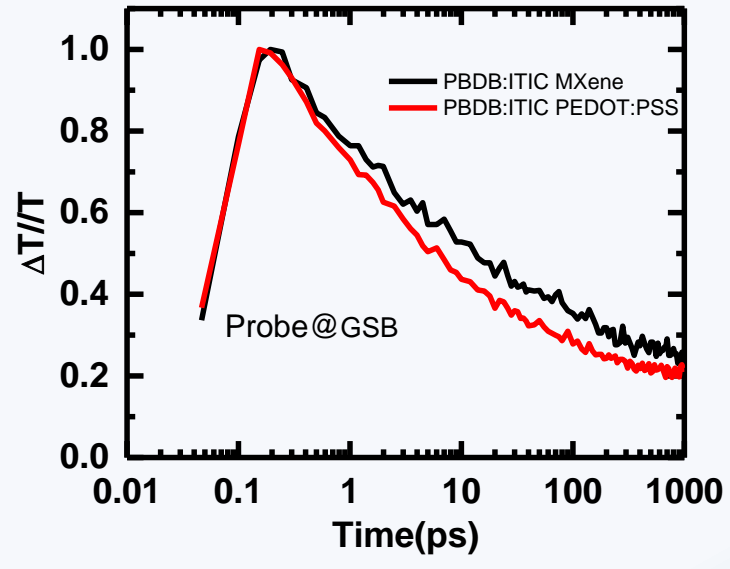
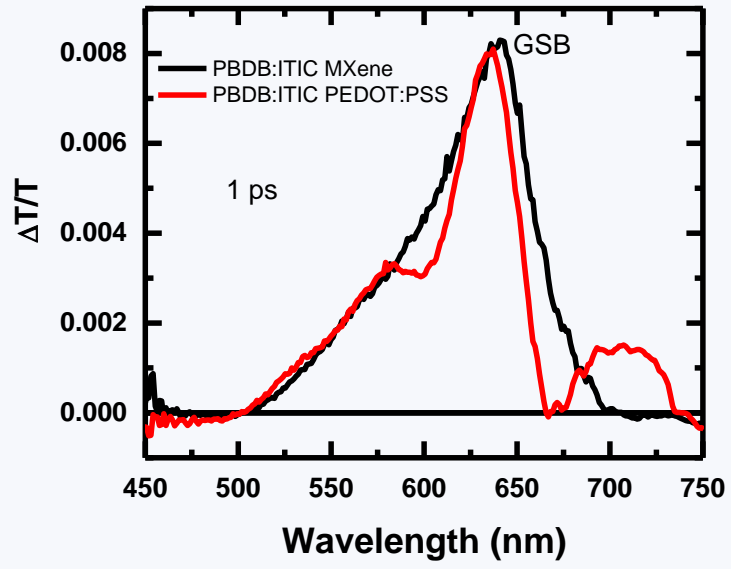


Charge Transfer in Conjugated Polymer-MXene System- Interface Engineering



PBDB:ITIC on PEDOT:PSS

PBDB:ITIC on MXene



Summary

- Students gained valuable experience in sample preparation, characterization, data analysis and research presentation.
- Increased research capacity of our research group by adding glovebox funded thorough this grant.
- Resulted the research publication
- In current, project, we observed high photoluminescence quenching and long-lived charges in PBDB:ITIC blend when thin film was prepared on Mxene charge transport layer.

