

Subject **[Scdt] M.Tech. thesis defence of Ankush K Meena: 11 AM Fri. 13.08.2021**

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Date 2021-08-10 14:47
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Zoom link:

<https://zoom.us/j/93752229256?pwd=RFQvbDV4bGZuVjR6anFwZm42c1JZQT09>

Meeting ID: 937 5222 9256

Passcode: 250513

Dear Friends,

Mr. Ankush Kumar Meena, Roll no.: 19204279 is currently a Ph.D. student from EE Department. He will defend his M.Tech. thesis on Friday, 13th August, 2021. Mr. Meena earlier was an M.Tech. student in the EE department since July 2018 and he converted to the Ph.D. programme in December, 2021 within the same department.

The details of his thesis defence are as follows:

Thesis Title: "Effect on organic solar cell performance by doping the device electron transport layer with silver nanoparticles"

Date and time: 13th August, 2021 (Friday) from 11 AM to 12 noon.

The thesis defence will be held over Zoom. The link is provided above. You are welcome to join the event over zoom.

With regards
S. Sundar Kumar Iyer (EE)
Thesis Advisor

Abstract of the thesis

There is a constant effort to maximise organic photovoltaic (OPV) cells' efficiency in order to take advantages of the devices in practical applications. One of the ways to improve efficiency of these devices is to enhance the light getting coupled into the organic solar cell device. In this thesis, the light coupled into a blend of poly(3 hexylethiophene):[6,6] phenyl C61 butyric acid phenyl ester (P3HT:PCBM) active area OPV cells is studied and optimized by incorporating silver nanoparticles (Ag-NP) in the device electronic transport layer (ETL) which consists of a zinc oxide (ZnO) layer.

By carrying out multiple experiments with varying Ag-NP concentration and analysing the optical and electrical characteristics of the films and devices, the effect on efficiency of the final device fabricated due to increased absorbance as well as the effect on charge transport and collection are analysed. Ag-NP, up to a point helps increase the optical coupling into the OPV device. The exciton and charge survival rates appear to be adversely affected by incorporating too much Ag-NP in the ETL of the device. Based on the experiments carried out, improvements in efficiency of up to 40% are obtained for the concentration of ZnO:Ag-NP at 1:0.25. Thus, incorporation appropriate amounts of Ag-NP in ETL of OPV devices does improve the overall efficiency of the device.

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