Subject	**[Scdt] M.Tech. Project Presentation by Lokesh Mahlawat 29th Thu. 4 PM**	
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Zoom link:
https://iitk-ac-in.zoom.us/j/93752229256?pwd=RFQvbDV4bGZuVjR6anFwZm42c1JZQT09

Meeting ID: 937 5222 9256
Passcode: 250513
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Dear Colleagues,

Mr. Lokesh Mahlawat, Roll no. 16807367, BT-MT student from Electrical
Engineering Department will be presenting his M.Tech. Project Report in an
on-line seminar. The details are as given below.

Topic: "Study of the S-kink in J-V curves due to the presence of energy
barriers and mobility imbalance in a P3HT:PCBM organic solar cell"

Date: 29th July, 2021 (Thursday)
Time: 4 PM
The zoom link for the presentation is given above.

Abstract of the M.Tech. project
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Organic solar cells have the potential to be cost-effective power sources.
But in terms of efficiency, they are still lagging behind their inorganic
counterparts. Sometimes an S- shaped kink in the device J-V curve under
illumination is encountered. And due to this S-kink, the fill factor and
hence the efficiency of the cells are reduced even further.

This work attempts to study the S-kink present in the J-V curves of
P3HT:PCBM based BHJ organic solar cells with the help of simulations. Two
different aspects of the J-V characteristics were studied using a couple
of reasons for the presence of the S-kink. The aspects that were used to
study the S-kink are the voltage at the inflection point normalized with
Voc and the maximum and minimum values of the curvature or second
derivative of the J-V characteristics close to the inflection point.

Firstly, the devices were simulated by varying the energy barriers (0.0 to
0.8 eV) at both contacts. We found that with a change in the energy
barriers there is change in the location of the inflection point, but the
curvature remains the same. Secondly, the devices were simulated by
varying the mobility ratio $\mu n/\mu p$ from 0.001 to 10000. We found
that the changes in the mobility ratio does not change the
normalized voltage at the inflection point whereas the magnitude of
curvature increases for some time and then starts to saturate for higher
mobility values.
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All interested are welcome to join the presentation.

With regards
S. Sundar Kumar Iyer
Thesis Advisor