

## Francis Paquin

Project 01 - Optimization of Nanoscale Interfaces in Organic PV Active Layers

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### Innovative Photovoltaic Cells Devices

As a fundamental physics experimentalist researcher in an organic photovoltaic research group, it is always interesting to see innovations on the photovoltaic devices (PV devices) side of our domain of study. During the three days of conferences, I managed to get involved into discussions related on the use of plasmonics for improved photovoltaic devices.

First I was wondering how plasmonics can be applied in this field. I was told that with the use of, for example, corrugated back electrodes, we could enhance the performance of PV devices due to the presence of a very strong local electric field generated by plasmonic waves. The intense electric field (that can also be generated by embedding very small nanoparticles at the surface of the polymer layer) can easily act as an exciton splitter or simply a diffuser of light to enhance the optical path length in a device.

I am also interested in the work of functionalisation of conjugated polymers for improved efficiency. I was wondering how people usually proceed to create new molecules. It seems that there are some theoreticians who are putting a lot of effort into using already known polymers and slightly changing the characteristic of side chains to play around with the energy levels of donors-acceptors system with DTF calculations. The more promising molecules are sent to chemists like Mario Leclerc who tries to synthesize them.

Finally, I'm already looking forward next years meeting! I hope to see the projects evolve quickly.