

## Development of tailor made donor-acceptor pairs for fullerene-free organic photovoltaics

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Organic solar cells (OCS) are now an established clean energy technology.<sup>1</sup> These photovoltaic devices can be printed at low temperatures onto large area, flexible substrates, and can be made semi-transparent, making them a low-cost alternative to traditional inorganic devices, and can be utilized in many niche applications. Current state-of-the art relies on a polymer-fullerene bulk-heterojunction active layer, with power conversion efficiencies reaching 10%.<sup>2</sup> While promising, certain limitations have prevented large scale commercialization. In an effort to advance OCS, the development of low-cost and sustainable active layer materials that can be mass-produced and yield high performance devices is essential. One area of our research at Dalhouise University centers on the development of electron deficient organic-conjugated materials to replace the common fullerene acceptors.<sup>3</sup> This talk will highlight our materials design strategy, sustainable synthetic practices towards these new materials, and discuss key thin-film characterization data and solar cell performance.

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