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Abstract for an Invited Paper
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The role of symmetry and charge delocalization in two-dimensional molecules conjugated molecules for optoelectronic applications¹
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Our group is investigating whether star molecules offer any advantage over linear polymers when used as the active layer in light-emitting diodes (LEDs), organic transistors (OFETs) or in photovoltaics (PVs). Specifically, we are investigating the role of architecture, synthesizing some novel molecules that contain a central tetra substituted phenyl ring. These molecules have a tendency to pi-pi stack, further delocalizing the carriers. The synthetic strategy used to prepare these molecules is versatile so that the four arms in the molecules do not have to be identical. The placement of differing arms also affords the opportunity to study the effect of symmetry on the properties of these molecules. The HOMO and LUMO levels can be changed via the type and placement of arms. Recent results obtained with these materials and their applications in photovoltaics and light-emitting diodes will be described.

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