



第244回 OPERA研究交流セミナー  
第235回 ISIT有機光エレクトロニクス研究特別室セミナー  
第302回 未来化学創造センターセミナー



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## 「Molecular electron acceptors and the new photophysical landscape of organic solar cells」

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Organic solar cells / photovoltaics (OPVs) are a promising technology for the utilisation of the most abundant renewable energy source: sunlight. Efficient light absorption enables OPVs to be ~1000 times thinner than traditional silicon solar cells, making them lightweight, flexible, and versatile. However, OPVs don't convert sunlight into electricity as efficiently as silicon technologies. Improvements in efficiency are primarily driven by the discovery of new materials with improved photophysics. This is particularly true of the past decade, which has seen the rise of a new generation of materials known as 'fused-ring' electron acceptors (FREAs). These materials have propelled OPV efficiency to >19 % due to their exceptional intrinsic properties and have also altered fundamental light-to-electricity conversion processes. This talk will survey our recent contributions to understanding the novel photo-physics of modern OPV materials, including:

- The discovery of exciton dissociation in a single component FREA material.
- Our investigations into the role of intersystem crossing, as a loss mechanism in OPVs.
- Our efforts to understand and model the rapid, long range energy transfer that occurs in FREAs, with the aim of enabling high-throughput virtual screening.