

特別講演会のお知らせ

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演題：Fascinating Molecular Nature of Organic Semiconductors –
Photoconversion Driven by Molecular Structure and Orientation

Organic semiconductors combine the semiconductor properties traditionally associated with inorganic materials with the more desirable properties of soft plastics. Moreover, the organic syntheses of these materials allow for great flexibility in the tuning of their electronic and optical properties. In particular, the development of small molecule-based non-fullerene acceptors has enabled organic photoconversion devices such as photovoltaics and photodetectors to show remarkable improvements in device efficiency. Although promising, there is still a lack of fundamental understanding of the impact of molecular structure and orientation on photophysical processes critical for device performance.

In this talk, I will discuss the molecular perspectives of organic semiconductors for high performance photoconversion devices. First, I will show the molecular-structure dependent photostability, with a particular focus on molecular planarity, rigidity, and end groups. Second, I will show the molecular orientation-dependent energy level shifts, demonstrating the impact of molecular quadrupole moments on thin film energetics and thereby on free charge generation. Finally, I will discuss how the minor modification of sidechains affects the structural relaxation dynamics via strong electron-phonon coupling and hence the excited states formation upon photoexcitation. These results provide key fundamental understanding of molecular semiconductors.

日時：令和 7 年 2 月 3 日（月） 15：00～16：30

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