

# ***G T R & R C M S   S e m i n a r***

## **2D perovskites: Tuning Orbit-Orbit Interaction To Advance Circular Polarization-Induced Spin Effects, Optic, and Electronic Properties By Controlling Thermodynamics in Forming Spin-Cast Films**



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Venue: Noyori Lecture Room

2D perovskites are known as solution-processing multifunctional 2D materials formed with inorganic-semiconducting layers carrying high-dielectric constant separated by insulating organic molecules with low-dielectric constant. The alternatively arranged high-dielectric inorganic layers and low-dielectric insulating organic molecules lead to ordered 2D multiple-quantum-well electronic structures by confining charge carriers within high-dielectric inorganic-semiconducting layers. Interestingly, the 2D multiple-quantum-well structures are simultaneously formed with spin-orbital coupling ordering, cooperative electron-phonon coupling, and Rashba band structures. Consequently, 2D perovskites can demonstrate circular polarization-induced spin phenomena, superior optoelectronic properties through orbit-orbit interaction, slow cooling of hot electrons towards ballistic transport, and quantum oscillation of conduction electrons at room temperature. Therefore, 2D perovskites with solution-processing capabilities present a unique platform to explore new obitronics, spintronics, and photo-physics phenomena. This presentation will discuss tuning the multifunctional properties through orbit-orbit interaction in 2D perovskites by controlling the thermodynamics in forming spin-cast films.



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