Oxides for Energy and Electronics

Wide-band-gap oxides are transparent in the visible, but can be doped to near-metallic conductivities, enabling use as contact layers to optoelectronic devices such as solar cells and light-emitting diodes. They can also be used, passively, in energy-efficient window coatings, or actively in smart windows or transparent electronics for displays. When grown as high-quality heterostructures, oxide-based transistors can be used in power electronics that boost the efficiency of power conversion, currently a large source of loss in applications ranging from hybrid cars to data centers. I will discuss how cutting-edge first-principles calculations provide key information about materials properties and enable designing new materials combinations for specific applications.

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3 PM KCBD 1103

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