

# New Precursors and Growth Processes for Complex Oxide Electronic Materials

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Oxide compounds with multiple metal atoms are called *complex oxides* because they can have many chemical states, crystal structures, and a wide range of useful properties. Wisconsin MRSEC researchers have developed a new way to create crystals of an important series of oxides for quantum electronics, involving the lanthanide row of elements on the periodic table.

The MRSEC team deposited lanthanide oxide films using a method called atomic layer deposition, using chemical precursors they developed. The resulting films are amorphous, with a disordered atomic structure, but heating them in contact with the surface of a substrate widely employed in oxide research transforms them into crystals templated by the substrate. This work required interdisciplinary collaboration among chemists, chemical engineers, and materials scientists, brought together by the MRSEC.

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