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Nota di contenuto	Preface; CONTENTS; Chapter 1 Introduction Gang Cao and Lance E. DeLong; Chapter 2 Spectroscopic Studies of Strong Spin-Orbit Coupling in 4d and 5d Transition Metal Oxides Soon Jae Moon and Tae Won Noh; 2.1. Introduction; 2.2. Spin-orbit Coupling-induced Fermi Surface Modification in 4d Sr <sub>2</sub> RuO <sub>4</sub> and Sr <sub>2</sub> RhO <sub>4</sub> ; 2.3. Spin-orbit Coupling-induced Jeff = 1/2 Mott State of 5d Sr <sub>2</sub> IrO <sub>4</sub> ; 2.3.1. Theoretical Description of the Jeff = 1/2 Mott State of Sr <sub>2</sub> IrO <sub>4</sub> ; 2.3.1.1. Schematic Model for the Jeff = 1/2 Mott State in the Atomic Limit; 2.3.1.2. Density-functional-theory Calculations 2.3.2. Spectroscopic Studies of the Jeff = 1/2 Mott State in Sr <sub>2</sub> IrO <sub>4</sub> 2.3.2.1. Optical Spectroscopy; 2.3.2.2. Angle-Resolved Photoemission Spectroscopy; 2.3.2.3. X-ray Absorption Spectroscopy; 2.3.2.4. Resonant X-ray Scattering; 2.3.3. Temperature-dependence of the Electronic Structure of the Jeff = 1/2 Mott State; 2.4. Correlated Metallic State of 5d Iridates; 2.4.1. Dimensionality-controlled Insulator-Metal Transition in Ruddlesden-Popper Series Sr <sub>n+1</sub> Ir <sub>n</sub> O <sub>3n+1</sub> (n = 1, 2, and ); 2.4.2. Electronic Structure Evolution in the Bandwidth-controlled Ca <sub>1-x</sub> Sr <sub>x</sub> IrO <sub>3</sub> System 2.5. Roles of Spin-orbit Coupling in Double Perovskite Rhenates and Other Iridates 2.5.1. Double perovskite A <sub>2</sub> FeReO <sub>6</sub> (A = Ba, Ca); 2.5.2. Large Orbital Magnetism and Spin-orbit Effects in BaIrO <sub>3</sub> ; 2.5.3. Pyrochlore Iridates R <sub>2</sub> Ir <sub>2</sub> O <sub>7</sub> (R: rare earth ions); 2.6. Future Studies;

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## Sommario/riassunto

This book is aimed at advanced undergraduates, graduate students and other researchers who possess an introductory background in materials physics and/or chemistry, and an interest in the physical and chemical properties of novel materials, especially transition metal oxides. New materials often exhibit novel phenomena of great fundamental and technological importance. Contributing authors review the structural, physical and chemical properties of notable 4d- and 5d-transition metal oxides discovered over the last 10 years. These materials exhibit extraordinary physical properties that differ

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