How to Read this Document

The LBNE science document is intended to inform a diverse readership about the goals and capabilities of the LBNE experiment. Your approach to reading this document will depend upon your purpose as well as your level of knowledge about high energy and neutrino physics.

The colored boxes distributed throughout the document highlight the important take-away points. They are integral to the document, but to the extent possible, are written in language accessible to the nonscientist.

The three chapters Chapter 1 *Introduction and Executive Summary*, Chapter 3 *Project and Design* and Chapter 9 *Summary and Conclusion* together provide a comprehensive overview of LBNE's scientific objectives, its place in the landscape of neutrino physics experiments worldwide, the technologies it will incorporate and the capabilities it will possess. Much of the information in these chapters is accessible to the lay reader, but of course, the scientific concepts, goals and methods around which LBNE is designed are by their nature highly specialized, and the text in certain sections is correspondingly technical.

In Chapter 2 *The Science of LBNE*, the initial paragraphs in each section provide some introductory information, but in general this chapter assumes a working knowledge of high energy physics and, ideally, familiarity with neutrino physics.

The three chapters that delve into the areas corresponding to the scientific objectives of LBNE: Chapter 4 *Neutrino Mixing, Mass Hierarchy and CP Violation*, Chapter 5 *Nucleon Decay Motivated by Grand Unified Theories* and Chapter 6 *Core-Collapse Supernova Neutrinos*, assume a working knowledge of high energy physics and particle astrophysics. This is also true of Chapter 7 *Precision Measurements with a High-Intensity Neutrino Beam* and Chapter 8 *Additional Far Detector Physics Opportunities*, as well as the appendices.