

**PROCEEDINGS
OF THE
SUMMER INSTITUTE ON PARTICLE PHYSICS**

August 3 – 11, 1998

**GRAVITY
From the Hubble Length to the Planck Length**

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PREFACE

The XXVI SLAC Summer Institute on Particle Physics was held from August 3 to August 14, 1998. The topic, “GRAVITY--from the Hubble Length to the Planck Length,” brought together 179 physicists from 13 countries.

The lectures in this volume cover the seven-day school portion of the Institute, which took us from the largest scales of the cosmos, to the Planck length at which gravity might be unified with the other forces of nature. Lectures by Robert Wagoner, Clifford Will, and Lynn Cominsky explored the embedding of gravity into general relativity and the confrontation of this idea with experiments in the laboratory and astrophysical settings. Avishai Deckel discussed observations and implications of the large-scale structure of the universe, and Tony Tyson presented the gravitational lensing effect and its use in the ongoing search for signatures of the unseen matter of the cosmos. The hunt for the wave nature of gravity was presented by Sam Finn and Peter Saulson, and Joe Polchinski showed us what gravity might look like in the quantum limit at the Planck scale.

The excellent lectures each morning were followed by afternoon discussion sessions, where students could further pursue questions and topics with the day's lecturers. The Institute concluded with a three-day topical conference covering recent developments in theory and experiment from around the world of elementary particle physics and cosmology; its proceedings are also presented in this volume.

We thank the lecturers for their well-prepared and stimulating lectures; the provocateurs who helped keep the afternoon discussion sessions rolling along; and most particularly the participants whose enthusiasm and intellect really make up what is most important to the success of the School. The Institute would not be possible without the support of SLAC staff and its administration. And finally, we are grateful for support from Stanford University and the U.S. Department of Energy.

Dave Burke, Lance Dixon, and Charles Prescott