



Space and Time



CHAPTER 1 **Position and Change**



CHAPTER 2 **Describing Motion**



CHAPTER 3 **Relative Motion at Low Speeds**



CHAPTER 4 **Special Theory of Relativity**

We think nothing of our differing points of view as we rate the latest movie or last week's bestsellers. In many respects, each of us sees something different. So it is with the concepts of position and motion. A book is on my left but your right. We say we're standing still, yet the earth upon which we stand rotates once every twenty-four hours, carrying us past the sun at a rate of 1670 kilometers per hour. Descriptions of position and motion do indeed depend upon our point of view.

In 1905 Albert Einstein added two more quantities—length and time—to our list of relative concepts. Objects are shorter and time moves more slowly to observers moving past at speeds near the speed of light. These ideas seem absurd, partly because our thoughts are dominated by low-speed experiences. However, the relativity of length and time has been verified experimentally.

Position, motion, length and time—our descriptions of space and time depend on our separate points of view. Physics offers a process by which separate points of view can be merged—a common reference frame from which descriptions can agree.