



This computer-enhanced photo of Earth was taken from about 36,000 km away. North and South America are clearly visible below the clouds. From this distance the “sky” is black. (Why we see blue sky from Earth is discussed in Chapter 24.)

We start this Chapter by learning some basics about science and its theories, and about measurement and units.

We also learn how to make quick estimates.

## CHAPTER 1

# Introduction, Measurement, Estimating

**P**hysics is the most basic of the sciences. It deals with the behavior and structure of matter. The field of physics is usually divided into *classical physics* which includes motion, fluids, heat, sound, light, electricity, and magnetism; and *modern physics* which includes the topics of relativity, atomic structure, condensed matter, nuclear physics, elementary particles, and cosmology and astrophysics. We will cover all these topics in this book, beginning with motion (or mechanics, as it is often called). But before we begin on the physics itself, we take a brief look at how this overall activity called “science,” including physics, is actually practiced.

### 1-1 The Nature of Science

The principal aim of all sciences, including physics, is generally considered to be the search for order in our observations of the world around us. Many people think that science is a mechanical process of collecting facts and devising theories. But it is not so simple. Science is a creative activity that in many respects resembles other creative activities of the human mind.