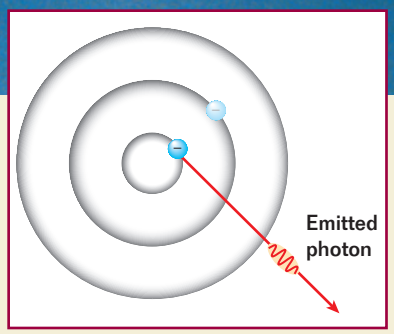
CHAPTER 21

Atomic Physics



Colorful lights similar to these in Denali National Park, Alaska, are commonly seen in the sky in northern latitudes. They are known as the *aurora borealis,* or the *northern lights*. The northern lights—which can extend thousands of kilometers—appear as arcs, bands, or streaks of color, sometimes flickering or pulsating. This is caused by billions of atomic "jumps," as shown in the diagram.

WHAT TO EXPECT

In this chapter, you will learn about the development of the field known as *quantum mechanics,* which is required to describe phenomena at the atomic level, where classical physics fails.

Why it Matters

The theory of quantum mechanics has led to many technological advances. For instance, it has enabled us to use nuclear energy and to perform life-saving MRIs. It also explains how the stars shine, and why the northern lights occur.

CHAPTER PREVIEW