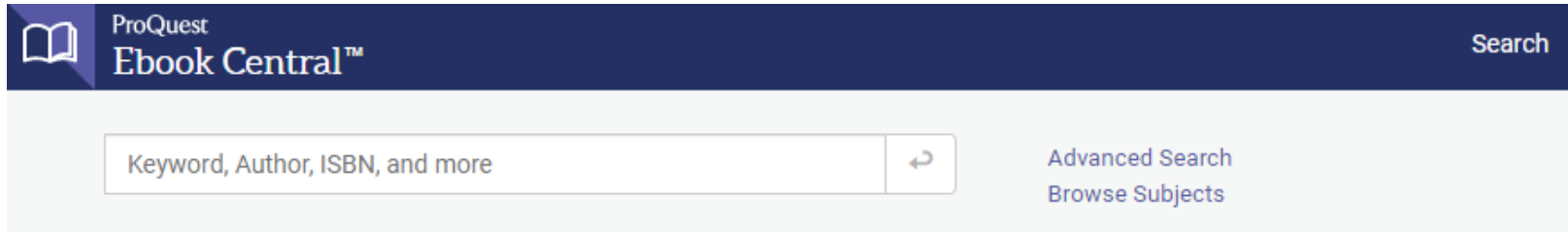


# Quick Guide for 'Ebook Central'



Return to Search Results



Feynman Lectures on Physics, Desktop Edition Volume III : The New  
Richard P. Feynman, Robert B. Leighton, and Matthew Sands

## 1. 'Read Online' 선택

Availability 동시이용자수 (unlimited, 3 copies, 1 copy 등)

Your institution has unlimited access to this book.

Read Online

Download Book

Get all pages, require free third party software, Check out this book for up to 21 days.

Download PDF Chapter

Get up to 115 pages, use any PDF software, does not expire.

온라인 상에서 복사-붙여넣기 가능한 최대 페이지 수  
58 pages remaining for copy (of 58)

115 pages remaining for PDF  
print/chapter download (of 115)

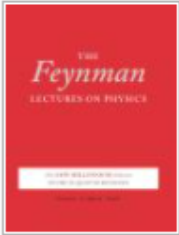
하루에 다운로드 및 프린트 가능한 최대 페이지 수

※ 'Download Book' 상세 안내 페이지

- 'Download Book': 대출 기능. 다운로드 받은 파일은 표시된 기간 이후 만료되어 이용 불가
- [EBook Central \(무료\)](#) 개인계정 생성 및 로그인, [ADE\(Adobe Digital Editions\) \(무료\)](#) 설치 필요



▼ Feynman Lectures on Physics,  
Desktop Edition Volume III : The  
New Millennium Edition



by Richard P. Feynman, , Robert B.  
Leighton, , and Matthew Sands

PUBLISHER  
Basic Books

DATE  
2011  
More...

## 2. 온라인에서 읽기

- 목차 활용하여 원하는 페이지로 이동 가능
- 로그인 하지 않은 상태로 이용 가능

Search within book

### TABLE OF CONTENTS

Intro

- ▶ Chapter 1. Quantum Behavior
- ▶ Chapter 2. The Relation of Wave and Particle Viewpoints
- ▶ Chapter 3. Probability Amplitudes
- ▶ Chapter 4. Identical Particles

I

### Quantum Behavior

#### 1-1 Atomic mechanics

"Quantum mechanics" is the description of the behavior of matter and light in all its details and, in particular, of the happenings on an atomic scale. Things on a very small scale behave like nothing that you have any direct experience about. They do not behave like waves, they do not behave like particles, they do not behave like clouds, or billiard balls, or weights on springs, or like anything that you have ever seen.

Newton thought that light was made up of particles, but then it was discovered that it behaves like a wave. Later, however (in the beginning of the twentieth century), it was found that light did indeed sometimes behave like a particle. Historically, the electron, for example, was thought to behave like a particle, and then it was found that in many respects it behaved like a wave. So it really behaves like neither. Now we have given up. We say: "It is like *neither*."

There is one lucky break, however—electrons behave just like light. The quantum behavior of atomic objects (electrons, protons, neutrons, photons, and so on) is the same for all, they are all "particle waves," or whatever you want to call them. So what we learn about the properties of electrons (which we shall use for our examples) will apply also to all "particles," including photons of light.

The gradual accumulation of information about atomic and small-scale behavior during the first quarter of the 20th century, which gave some indications about how small things do behave, produced an increasing confusion which was finally resolved in 1926 and 1927 by Schrödinger, Heisenberg, and Born. They finally obtained a consistent description of the behavior of matter on a small scale. We take up the main features of that description in this chapter.

Because atomic behavior is so unlike ordinary experience, it is very difficult to get used to, and it appears peculiar and mysterious to everyone—both to the novice and to the experienced physicist. Even the experts do not understand it the way they would like to, and it is perfectly reasonable that they should not, because all of direct, human experience and of human intuition applies to large objects. We know how large objects will act, but things on a small scale just do not act that way. So we have to learn about them in a sort of abstract of



### 3. 전체 다운로드

- 선택한 기간동안 대출하여 이용
- 로그인 필수

### 4. 챕터 다운로드

- 'Current Chapter'(현재챕터)만 다운로드

### 5. 복사

- 복사 아이콘 선택 후 드래그 / 드래그 후 복사 아이콘 선택 → 내용 확인 후 Ctrl+C

### 6. PDF로 인쇄

- 페이지 범위 지정
  - ▶ ① 현재 페이지
  - ▶ ② 시작 및 끝 페이지 직접 입력
  - ▶ ③ 현재 챕터
- ※ 최대 허용 페이지수 이내로 지정
- ▶ Chapter 3 "Maximum XX pages"

1

## Quantum Behavior



"Quantum mechanics" is the description of the behavior of matter and light in all its details and, in particular, of the happenings on an atomic scale. Things on a very small scale behave like nothing that you have any direct experience about. They do not behave like waves, they do not behave like particles, they do not behave like clouds, or billiard balls, or weights on springs, or like anything that you have ever seen.

Newton thought that light was made up of particles, but then it was discovered that it behaves like a wave. Later, however (in the beginning of the twentieth century), it was found that light did indeed sometimes behave like a particle. Historically, the electron, for example, was thought to behave like a particle, and then it was found that in many respects it behaved like a wave. So it really behaves like neither. Now we have given up. We say: "It is like *neither*."

There is one lucky break, however—electrons behave just like light. The quantum behavior of atomic objects (electrons, protons, neutrons, photons, and

so on) is the same for all, they are all "particle waves," or whatever you want to call them. So what we learn about the properties of electrons (which we shall use for our example) will apply to all "particle waves," including photons of light.

### ※ 추가 다운로드 및 내용 복사

- Ebook Central 개인 계정 접속
  - 로그아웃 약 24시간 경과 후 최대 허용 페이지수 초기화

having during the first quarter of the 20th century, which gave some indications about how small things do behave, produced an increasing confusion which was finally resolved in 1926 and 1927 by Schrödinger, Heisenberg, and Born. They showed that the behavior of matter on a small scale is very different from the behavior of matter on a large scale. It is difficult to understand the behavior of small things because it is so peculiar and mysterious to everyone—both to the physicist. Even the experts do not understand it the way they would like to, and it is perfectly reasonable that they should not, because all of direct, human experience and of human intuition applies to large objects. We know how large objects will act, but things on a small scale just do not act that way. So we have to learn about them in a sort of abstract or