

Index

A

abelian group

3.1: Overview

Albert Einstein

1.4: Failures of Classical Physics

angular momentum

5.5: Angular Momentum

angular momentum coupling

8.4: Angular Momentum Coupling

angular nodes

6.2: The Quantum Mechanical H-atom

anharmonicity constant

4.3: Strengths and Weaknesses

aufbau principle

8.2: The Aufbau Principle

B

Balmer's formula

6.1: Older Models of the Hydrogen Atom

Bell's inequality

11.5: Bell's Inequality

blackbody radiation

1.4: Failures of Classical Physics

bonding orbitals

9.3: Molecular Orbital Theory

bosons

8.5: The Pauli Exclusion Principle

C

Clebsch series

8.4: Angular Momentum Coupling

commutator

2.4: The Tools of Quantum Mechanics

completeness

2.5: Superposition and Completeness

Coulomb integral

9.3: Molecular Orbital Theory

D

degeneracy

2.6: Problems in Multiple Dimensions

Deslandres table

8.6: Atomic Spectroscopy

Doppler width

10.4: Laser Spectroscopy

dye laser

10.3: Examples of Laser Systems

E

effective nuclear charge

6.3: Rydberg Spectra of Polyelectronic Atoms

eigenfunction

1.3: Classical Description of a Wave on a String

eigenvalue problem

1.3: Classical Description of a Wave on a String

entanglement

2.8: Entanglement and Schrödinger's Cat

EPR paradox

11.4: Spooky Action at a Distance

excimer laser

10.3: Examples of Laser Systems

expectation values

2.4: The Tools of Quantum Mechanics

F

fermions

8.5: The Pauli Exclusion Principle

fluorescence

10.4: Laser Spectroscopy

free electron model

2.7: The Free Electron Model

frequency doubling

10.3: Examples of Laser Systems

G

Great Orthogonality Theorem

3.7: The "Great Orthogonality Theorem"

Group Theory

4.5: Group Theory Considerations

H

Heisenberg uncertainty principle

2.4: The Tools of Quantum Mechanics

Hermite polynomials

4.2: Solving the Schrödinger Equation

Herzberg diagrams

9.6: Herzberg Diagrams

hidden variable

11.4: Spooky Action at a Distance

hole rule

8.4: Angular Momentum Coupling

Hund's coupling

9.4: Hund's coupling cases (a) and (b)

I

infrared spectroscopy

4.4: Vibrational Spectroscopy Techniques

irreducible representations

3.6: Representations

L

Landé Interval rule

8.6: Atomic Spectroscopy

laser

10: Lasers

laser spectroscopy

10.4: Laser Spectroscopy

LCAO

9.3: Molecular Orbital Theory

M

Max Planck

1.4: Failures of Classical Physics

microstate method

8.4: Angular Momentum Coupling

molecular orbital theory

9.3: Molecular Orbital Theory

molecular term symbols

9.5: Diatomic Term Symbols

Morse potential

4.3: Strengths and Weaknesses

N

nitrogen laser

10.3: Examples of Laser Systems

nodes

6.2: The Quantum Mechanical H-atom

normalization

2.3: The One-Dimensional Particle in a Box

O

orbital diagrams

8.3: Orbital Diagrams

orthogonal

2.3: The One-Dimensional Particle in a Box

overlap integral

9.3: Molecular Orbital Theory

P

paramagnetism

9.3: Molecular Orbital Theory

partition function

10.1: Fractional Population of Quantum States

Pauli exclusion principle

8.5: The Pauli Exclusion Principle

perturbation theory

7.1: Perturbation Theory

photoelectric effect

1.4: Failures of Classical Physics

population inversion

10.1: Fractional Population of Quantum States

potential energy surface

4.1: The Potential Energy Surface for a Diatomic Molecule

Q

quantum defect

6.3: Rydberg Spectra of Polyelectronic Atoms

R

radial nodes

6.2: The Quantum Mechanical H-atom

rare gas ion laser

10.3: Examples of Laser Systems

reduced mass

4.1: The Potential Energy Surface for a Diatomic Molecule

representation

3.6: Representations

rovibronic transitions

9.7: Vibronic Transitions

Rydberg constant

6.2: The Quantum Mechanical H-atom

Rydberg spectra

6.3: Rydberg Spectra of Polyelectronic Atoms

S

Schrödinger's Cat

2.8: Entanglement and Schrödinger's Cat

shielding constant

6.3: Rydberg Spectra of Polyelectronic Atoms

spherical harmonics

5.4: Spherical Harmonics

spin

11.3: The Stern-Gerlach Experiment

superposition

2.5: Superposition and Completeness

T

term symbols

[8.4: Angular Momentum Coupling](#)

[9.8: Term Symbols for Polyatomic Molecules](#)

total angular momentum

[8.4: Angular Momentum Coupling](#)

totally symmetric representation

[3.6: Representations](#)

tunneling

[4.2: Solving the Schrödinger Equation](#)

U

ultrafast laser

[10.3: Examples of Laser Systems](#)

V

Variational Method

[7.2: Variational Method](#)

vibrational spectroscopy

[4.4: Vibrational Spectroscopy Techniques](#)

vibronic transitions

[9.7: Vibronic Transitions](#)

vibronically allowed transition

[9.9: Group Theoretical Approach to Molecular Orbitals](#)