

GUIDELINES FOR PRA SECTION SELECTION

(Revised July 2009)

Sections are listed below with representative specific topics. PACS numbers are included for help in selecting the *principal* PACS number of an article, which should correspond to the appropriate section. Please note that the more specific codes supersede the general category codes. The listing is not complete; secondary PACS selections are not limited to those contained here. Complete PACS listings may be accessed electronically at <http://publish.aps.org/PACS/>. An asterisk (*) after a PACS number refers to all categories following the decimal point; a dagger (†) to some categories following the decimal point.

ATOMIC, MOLECULAR, AND OPTICAL PHYSICS

1. Fundamental concepts

Quantum mechanics, special relativity, quantum electrodynamics, tests of fundamental laws and interactions, and related topics.

Quantum mechanics 03.65.† (03.65.Nk belongs in A-4)

Special relativity 03.30.+p

Metrology 06.20.*

Charge conjugation, parity, time reversal, and other discrete symmetries in atoms 11.30.Er

Quantum electrodynamics 12.20.*

2. Quantum information

Quantum computation, quantum communication, quantum cryptography; related topics.

Quantum information 03.67.*

Optical implementation of quantum information processing and transfer 42.50.Ex

3. Atomic and molecular structure and dynamics

Static and dynamic properties of atoms and simple molecules. Calculations and mathematical techniques in atomic and molecular physics; structure; oscillator strengths; spectroscopy; lifetime measurements; exotic atoms and molecules; related topics.

Electronic structure of atoms, molecules, and ions: theory 31.*

Properties of atoms and atomic ions 32.10.† (32.10.Ee belongs in A-7)

Atomic spectra 32.30.*

Intensities and shapes of atomic spectral lines 32.70.*

Other topics in atomic structure and dynamics 32.90.+a

Properties of molecules 33.15.*

Molecular spectra 33.20.*

Photoelectron spectra 33.60.+q

Intensities and shapes of molecular spectral lines and bands 33.70.*

Other topics in molecular properties and interactions with photons 33.90.+h

Exotic atoms and molecules 36.10.*

4. Atomic and molecular collisions and interactions

Scattering theory; electron, atom, and molecule collisions; collisional line broadening.

Nonrelativistic scattering theory 03.65.Nk

Relativistic scattering theory 11.80.*

General theories and models of atomic and molecular collisions and interactions 34.10.+x

Interatomic and intermolecular potentials and forces 34.20.*

Scattering of atoms and molecules 34.50.† (34.50.Bw belongs in A-5; 34.50.Rk belongs in A-7)

Charge transfer 34.70.+e

Electron and positron scattering 34.80.† (34.80.Qb belongs in A-7)

Other topics in atomic and molecular collision processes and interactions 34.90.+q

5. Photon, electron, atom, and molecule interactions with solids and surfaces

Interactions of atoms and molecules with surfaces 34.35.+a

Energy loss and stopping power 34.50.Bw

Channeling phenomena 61.85.+p

Impact phenomena 79.20.*

6. Clusters (including fullerenes)

Atomic and molecular properties and processes of clusters.

Atomic and molecular clusters 36.40.*

Structure of fullerenes 61.48.*

7. Atomic and molecular processes in external fields, including interactions with strong fields and short pulses

Interactions of atoms and molecules with external fields; single photon excitation and ionization; multiphoton excitation and ionization and other strong-field effects; trapping and cooling; collisions in laser fields; transient processes; optical pumping and optical preparation of superposition states.

Magnetic bound states, magnetic trapping of Rydberg states 32.10.Ee

Fluorescence and phosphorescence 32.50.+d, 33.50.*

Zeeman and Stark effects 32.60.+i

Photoionization and excitation of atoms 32.80.*

Photon interactions with molecules 33.80.*

Spectra induced by strong-field or attosecond laser irradiation 33.20.Xx

Nuclear resonance and relaxation 33.25.+k

Electron resonance and relaxation 33.35.+r

Multiple resonances 33.40.+f

Magneto-optical and electro-optical spectra and effects 33.57.+c

Laser-modified scattering and reactions 34.50.Rk, 34.80.Qb

Atom, molecule and ion cooling methods 37.10.*

Optical transient phenomena; quantum beats, photon echo, free-induction decay, dephasings and revivals, optical nutation, and self-induced transparency 42.50.Md

8. Matter waves and collective properties of cold atoms and molecules

Atom and neutron optics, Bose-Einstein condensation phenomena, and related topics.

Matter waves 03.75.*

Interferometers 07.60.Ly

Atom interferometry techniques 37.25.+k

Ultracold gases, trapped gases 67.85.*

9. Quantum optics, physics of lasers, nonlinear optics, classical optics

Interaction between atoms and quantized radiation; properties of radiation fields; cavity quantum electrodynamics; nonclassical states of the electromagnetic field; physics of lasers and other active media; nonlinear optics, including high-harmonic generation and generation of strong optical fields and ultrashort pulses.

Optical activity and dichroism 33.55.+b

Atomic and molecular beam sources and techniques 37.20.+j

Atoms, molecules and ions in cavities 37.30.+i

Geometrical optics 42.15.*

Wave optics 42.25.*

Imaging and optical processing 42.30.*

Holography 42.40.*

Quantum optics 42.50.† (42.50.Md belongs in A-7)

Lasers 42.55.*

Laser optical systems: design and operation 42.60.*

Laser applications 42.62.*

Nonlinear optics 42.65.*

Optical materials (except 42.70.Df) 42.70.*

Optical elements, devices, and systems 42.79.*

Fiber optics 42.81.*