

**Capitalization  
and Acronyms  
in Physics**

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Practice your mastery of capitalization and the use of acronyms in physics.

## Nouns

Which is correct?

- a) Fermion
- b) quantum hall effect
- c) Bose–Einstein Condensate
- d) Lorentz force
- e) Atomic Force Microscope (AFM)

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- d) Lorentz force**
- e) Atomic Force Microscope (AFM)

Why the other answers are wrong:

- a) When a proper noun is used to name an entirely new class of things, the new class is a common noun and is not capitalized. Further, the names of subatomic particles are not capitalized.
- b) “Hall” should be capitalized; it refers to the discoverer of the effect, American physicist Edwin H. Hall.
- c) Only proper nouns are capitalized; *condensate* should be written lower case.
- d) The names of apparatus are not capitalized.

## Units of Measure

Which is correct?

- a) 145 Watts
- b) 100 mm
- c) 77°K
- d) 500 KeV
- e) 80 microns

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a) 145 Watts

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c) 77°K

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Why the other answers are wrong:

a) (i) Watt is not capitalized when it is spelled out as a word; only the abbreviation is capitalized. (ii) Units of measure are always abbreviated following an exact number.

c) The kelvin is an absolute unit, not a scale. The degree sign ( $^{\circ}$ ) is used only for Fahrenheit and Celsius temperature scales.

d) The “k” that indicates “kilo” (thousands) is never written upper case.

e) Units of measure are always abbreviated when they follow an exact number.

## Elements and Nuclides

Which is correct for an isotope of helium?

- a) Helium-3
- b) helium-3
- c)  ${}^3\text{He}$
- d)  $\text{He}_3$
- e)  $\text{He}^3$

## Elements and Nuclides

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The mass number of an element is indicated by an anterior superscript.

### Notation for elements and their nuclides

$^{60}\text{C}$	mass number
$^{14}\text{N}_2$	number of atoms in molecule
$\text{Ca}^{2+}$	state of ionization
$^{110}\text{Ag}^m, ^{14}\text{N}^*$	excited state

**Tip: Names of elements are written lower case when they are written as words; abbreviations are capitalized**

The notation for elements and their nuclides was formalized by the Union of Pure and Applied Physics in the late 1960s. Papers published before that date used a variety of notation, which would now be considered wrong or nonstandard.



## Proper Names & Physical Phenomena

Which is correct?

- a) special relativity
- b) First Law of Thermodynamics
- c) De Broglie wave length
- d) Smoothed Particle hydrodynamics
- e) Big Bang

## Proper Names & Physical Phenomena

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- b) First Law of Thermodynamics
- c) De Broglie wave length
- d) Smoothed Particle hydrodynamics
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Why the other answers are wrong:

b) Laws are not capitalized.

c) The French physicist who made groundbreaking contributions to quantum theory was Louis-Victor-Pierre-Raymond, 7e duc de Broglie. The “de” should be written lower case. And “wavelength” is one of three *wave* words that is written closed.

d) Methods are not capitalized, unless they contain the inventor’s name, e.g., Raman spectroscopy or Compton backscattering.

e) Physical phenomena (sonoluminescence, superconductivity, magnetism, inflation) are not capitalized. Although some authors do capitalize “big bang,” most style guides and *The Oxford Dictionary for Scientific Writers and Editors* say to write it lower case.

## **Proper Names, Physical Phenomena, & Techniques**

**Which is correct?**

- a) **Total-Internal-Reflection microscopy**
- b) **Brillouin Scattering**
- c) **angle-resolved photoemission spectroscopy**
- d) **Pulsed-Laser Deposition**
- e) **auger spectroscopy**

## Proper Names, Physical Phenomena, & Techniques

Which is correct?

- a) Total-Internal-Reflection microscopy
- b) Brillouin Scattering
- c) angle-resolved photoemission spectroscopy
- d) Pulsed-Laser Deposition
- e) auger spectroscopy

Why the other answers are wrong:

- a) The names of apparatus are not capitalized (e.g., diffractometer, interferometer, scanning tunnelling microscope).
- b) The names of physical phenomena are not capitalized, unless they contain a proper noun used as an adjective. In this case, *Brillouin* (French physicist Léon Brillouin) should be capitalized and *scattering* should not.
- d) The names of physical processes or methods are not capitalized, unless they contain a proper noun used as an adjective. (See (b).)
- e) The method is named after Pierre Vincent Auger, who is credited with discovering the Auger effect. (The effect was actually discovered by Lise Meitner in 1922; Auger discovered it independently somewhat later.)

## Acronyms

### Which is correct?

- a) RSXS (resonant soft x-ray scattering)
- b) chemical vapor deposition (CVD)
- c) Blonder–Tinkham–Klapwijk (B-T-K) theory
- d) quantum chromodynamics (QCD)
- e) Path Integral Monte Carlo (PIMC) methods

## Acronyms

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Why the other answers are wrong:

- a) Spell out the words first, and then put the acronym in parentheses.
- c) Punctuation is not used in acronyms. Periods are occasionally (very occasionally) used in abbreviations. Refer to the *AIP Style Manual* for abbreviations using periods (e.g., N.B., H.c.)
- d) Some acronyms are so widely recognized that they do not require definition; QCD is one. Others include BCS, NMR, DNA, rpm; refer to the *AIP Style Manual* for a complete list.
- e) Only the proper noun (Monte Carlo) is capitalized in the spelled-out version of the acronym.

## Acronyms

Some common acronyms and abbreviations need not be defined. Which is correct?

- a) RF
- b) FCC
- c) et. al.
- d) UV
- e) ac

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**Tip: See Appendix D of the AIP Style Manual for a complete list**

Why the other answers are wrong:

a), b), and d) should not be capitalized.

c) The abbreviation stands for the Latin term *et alii* (*and others*). The *et* is not an abbreviation, so no period should be used after *et*; *al.* IS an abbreviation—hence, the period.



## Acronyms

### Which is correct?

- a) Field-cooled (FC) and zero-field-cooled (ZFC) DC magnetic measurements were performed.
- b) The hydrogen vibron can be probed by ir spectroscopy.
- c) dc SQUIDs were used to observe quantum phase slips in the nanowire samples.
- d)  $\alpha$ -particle radiation consists of two protons and two neutrons bound together into a particle.
- e) LEEM images recorded before and after  $\text{Si}_{13}\text{C}$  growth are shown in Fig. 1(c).

## Acronyms

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- b) The hydrogen vibron can be probed by ir spectroscopy.**
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Why the other answers are wrong:

a) is wrong because the abbreviation for “direct current” is written lower case, viz., dc.

c), d), and e) are wrong, because a sentence may not begin with an acronym, symbol, or number written in numerals. And no sentence can begin with an abbreviation written in lower case.

## Plurals

**Which correctly presents a plural?**

- a) The binary number system uses 0's and 1's.
- b) atomic force microscopes (AFM's)
- c) Boeing 767's
- d) metal-oxide-semiconductor field-effect transistors (MOSFETs)

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Why the other answers are wrong:

b) Do not use an apostrophe to make an acronym plural; just add a lower-case letter s.

c) Do not use an apostrophe to make a number written as more than one numeral plural; just add a lower-case letter s.

**To recap...**

**Write whole words lower case\* ; capitalize abbreviations (generally)**

**Capitalize proper nouns when used as adjectives**

**Don't capitalize particles, theories, physical phenomena, apparatus, or techniques\***

**Define acronyms at first use**

**Don't start a sentence with an acronym, symbol, or number written in numerals**

**Just add an s to make an acronym plural**

**When in doubt, write it out!**



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**\*unless it's a proper noun (name of a specific person, place, or thing)**

NOTES: