Acronyms, Initialisms, and Abbreviations in Science Writing

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“In this class, we use a lot of three-letter acronyms, or TLAs.”

—Dale Van Harlingen
Which is which?

Abbreviation—shortened form of word

average = av  const = constant
usually written lower case and without a terminal period (.)

Acronym—pronounced as a word

NASA, MOSFET, LIGO

Initialism—pronounced letter-by-letter

STM, QCD, CMB
Define acronyms and initialisms (A&Is) at their first use

Spell out the words first, followed by the acronym in parentheses ( )

Cosmic Background Imager (CBI)
density functional theory (DFT)

The AIP lists common physics acronyms that need not be defined

BCS
emf
NMR
dc
A sentence may NOT begin with an acronym or initialism, even if it has been previously defined.

To image the surface of thin films of a superconducting crystal, the group uses a low-temperature scanning tunneling microscope (STM) that they built at Illinois. STM topographic images are correlated with X-ray crystallographic data.
Capitalize most A&Is

Some common A&Is are not capitalized (see AIP)

- rpm (revolutions per minute)
- ac (alternating current)
- rf (radio frequency)

The spelled-out words are not capitalized, unless they constitute a proper name

- magnetohydrodynamics (MHD)
- atomic force microscope (AFM)
- National Academy of Sciences (NAS)
- Bose–Einstein condensate (BEC)
The use of periods (.) in abbreviations is evolving

American usage is to put periods after one-word abbreviations (Dr., Ms.) but not after multi-word abbreviations (APS, NIH)

British usage is just the opposite (Dr, Ms, I.U.P.A.P., N.I.H.)

*Chicago Manual of Style* and CBE now recommend no periods anywhere
Plurals don’t require apostrophes

Do not use an apostrophe to make an acronym or abbreviation plural

AFMs
CD-ROMs
PMTs

While I’m on the subject, don’t use an apostrophe to make numbers greater than 9 plural, either

expressed in 100s
Boeing 767s
Select an article (*a* or *an*) by the sound of the acronym it precedes

Begins with a vowel sound → *an*
   *an* STM

Begins with a consonant sound → *a*
   *a* SQUID
   *a* USDA-approved pesticide

What about Si (???)
   *a* Si substrate
   *an* SiO₂ substrate