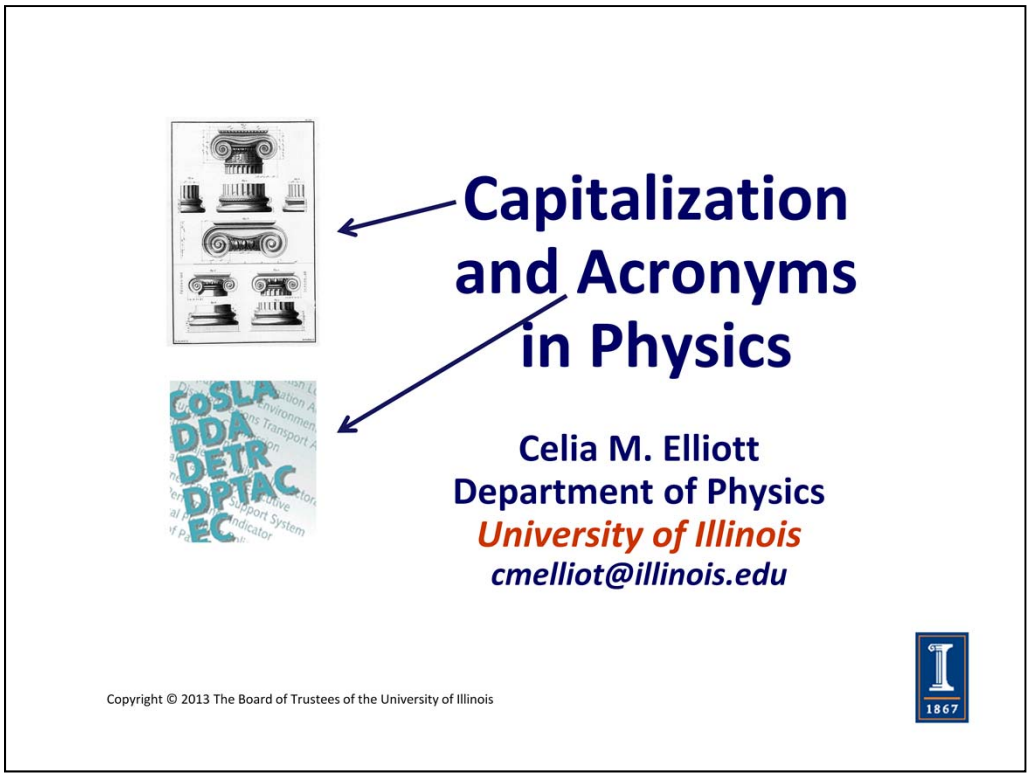
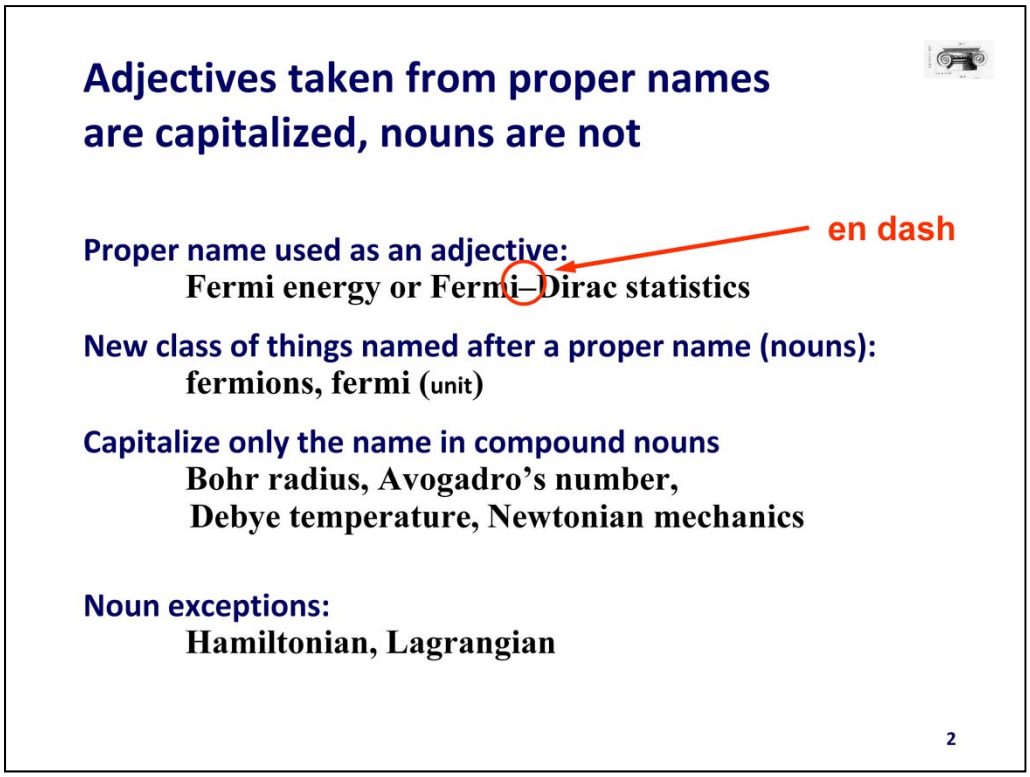


Today we'll look at conventions for capitalization and the use of acronyms in technical writing.

The basic rules of capitalization—proper nouns are capitalized and common nouns are not—generally apply in science writing, except for some special cases. (There are ***always*** "special cases" in English and physics.) Today, we'll look at them.



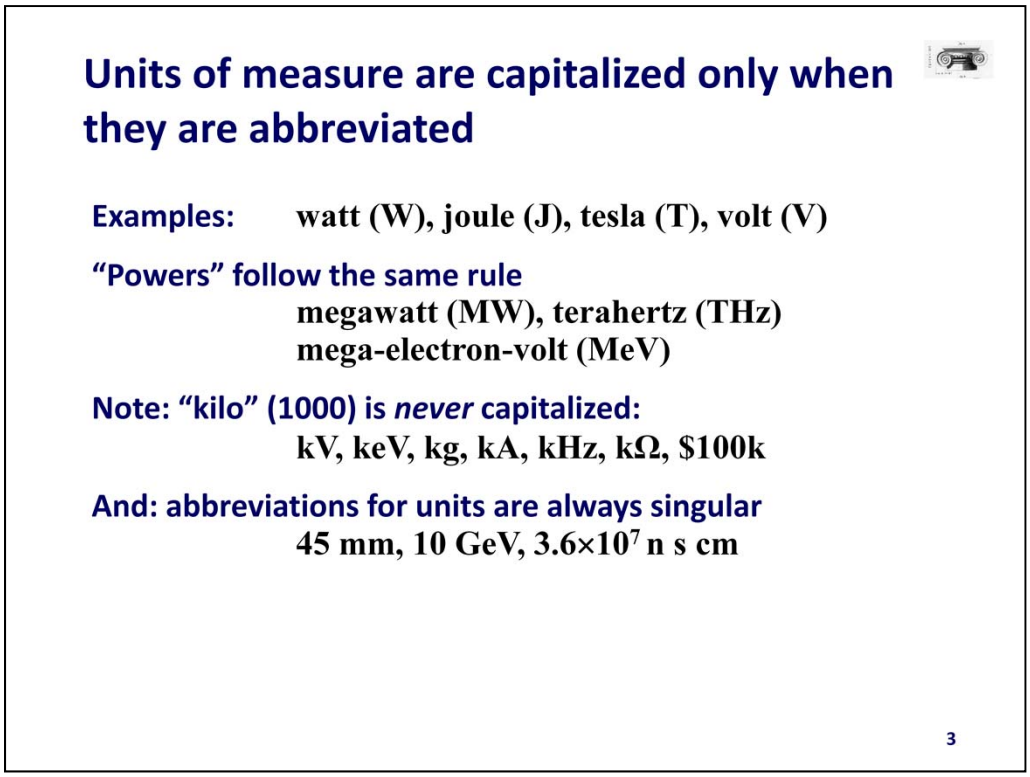
If a proper noun is used as an adjective, it's ***always*** capitalized.

For *Hamiltonian* and *Lagrangian*, the "function" is implied but unstated, so the "adjective" rule still applies. These are the only two examples that I've been able to think of where a word derived from a proper noun is still capitalized when it's used as a noun, but there are probably others. (Pesky mathematicians!)

Note that only the proper noun (name) is capitalized in a compound noun; the common noun is written lower case (e.g., Compton scattering)

If you're not sure whether a word should be capitalized or written lower case, consult a scientific dictionary (I recommend *The Oxford Dictionary for Scientific Writers and Editors*) or the AIP Style Guide. You can buy a good used copy of the Oxford for about $10, and you can download the AIP Style Guide for free (q.v. http://www.aip.org/pubservs/style/4thed/toc.html).

An en dash (think of it as a super-hyphen) is used to join two proper nouns to make a combined adjective. We'll talk more about dashes later in the semester.



Even though we think "45 millimeters" when we see "45 mm," the unit is written as a singular.

And remember, the unit is always abbreviated when it is associated with an exact number (measured or calculated); it is written out as a word only when it refers to an approximate number. Thus: "7 kg" and "a few kilograms"

Names of elements are never capitalized when written as words, only when they are abbreviated

argon (Ar)	silicon (Si)
curium (Cm)	californium (Cf)

And while we're on the subject of elements…

^{60}C	mass number
$^{14}N_2$	number of atoms in molecule
Ca^{2+}	state of ionization
$^{110}Ag^{m}$, $^{14}N^{*}$	excited state

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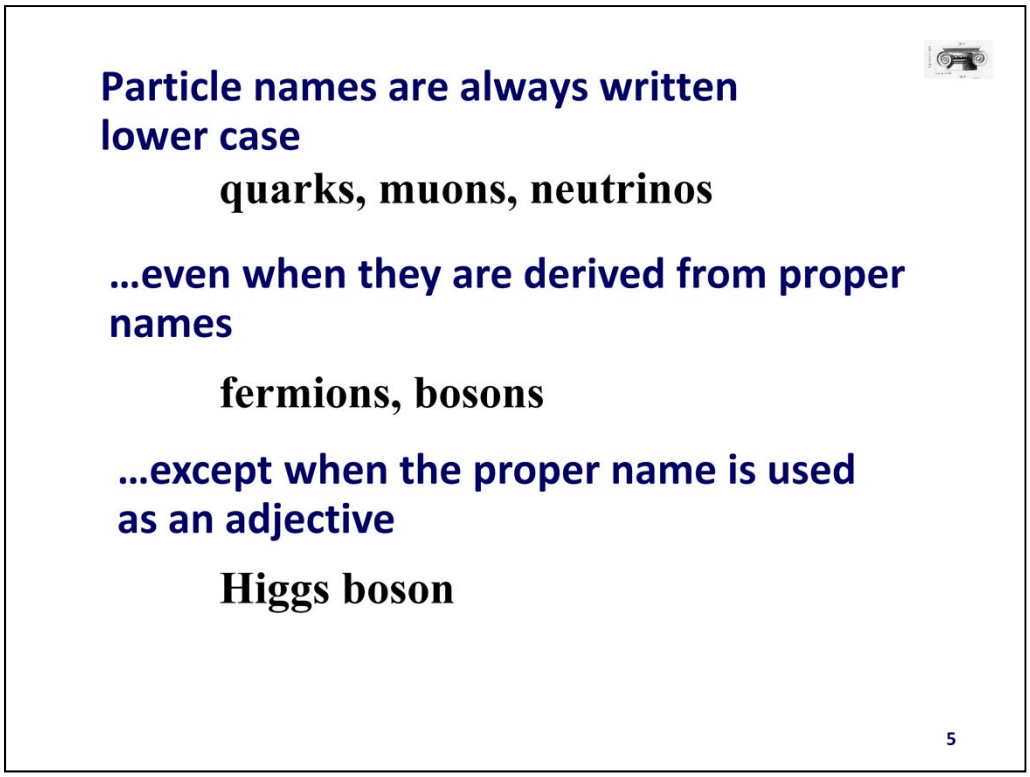
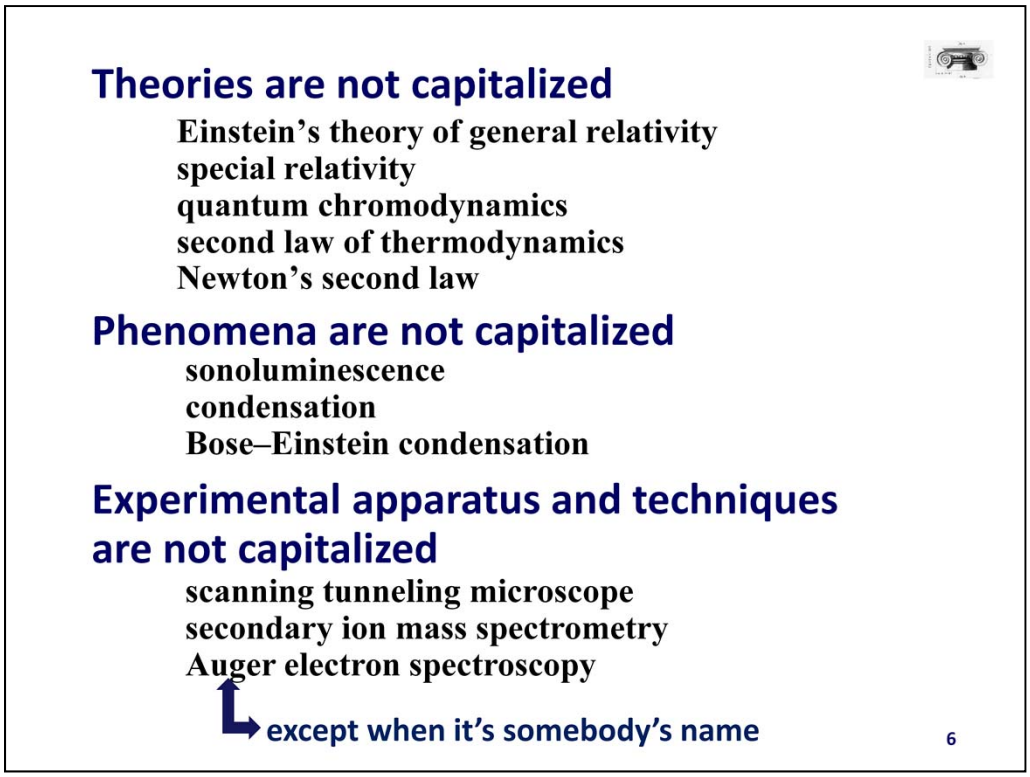
In general, common nouns are not capitalized when they're written out as words, but the abbreviations are ALWAYS capitalized—whether they're units, elements, or acronyms.

Elements, even those derived from proper names (curium, francium), are always written lower case when they are written out as words. Only the abbreviations are capitalized, and just the first letter of the abbreviation is capitalized.

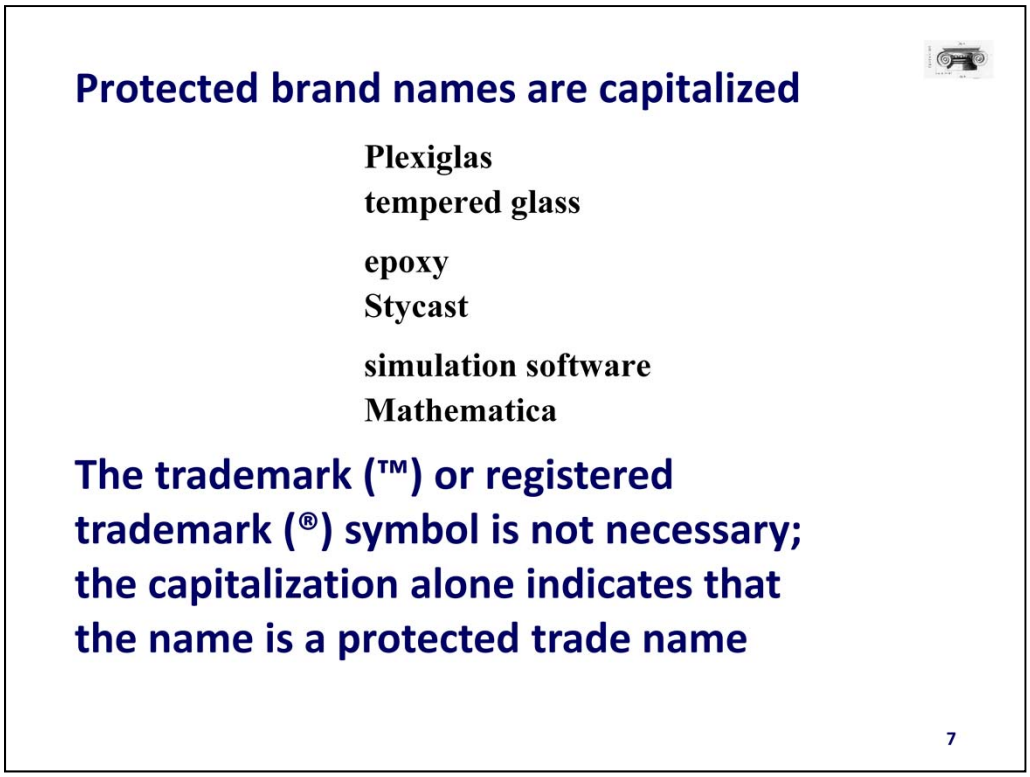
The notation shown for chemical elements is the convention adopted by the International Union of Pure and Applied Physics in the 1970s. While you'll see "He-3" written in older papers (and by older authors), use ^{3}He now.



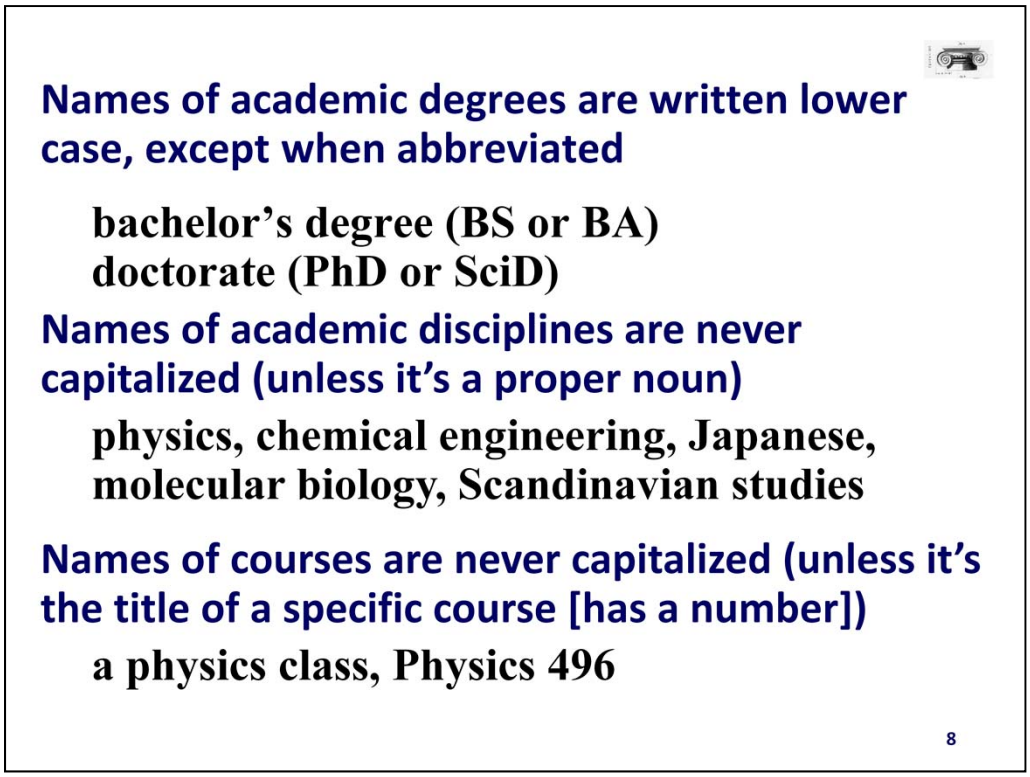
Although not used much by physicists, the names of minerals are never capitalized either, e.g., dolomite, diamond, even when derived from a proper name (fosterite, smithsonite).



In these examples, "Einstein's," "Newton's," "Bose–Einstein," and "Auger" ***are*** capitalized because they are proper nouns (names) used as adjectives.



If used, the trademark and registered trademark symbol appear immediately after the trade name (no spaces) and are superscripted.



In keeping with current usage, periods are no longer recommended for the abbreviations for academic degrees (more about abbreviations soon).

In general, if a number is associated with the name of something, the resulting compound noun is considered a "title" and is capitalized. (This rule is analogous to the one we learned last week about figure captions—"in the figure" but "in Figure 4.")

Single words or phrases following a colon are not capitalized

"Values were obtained for two parameters: the quantum cyclotron radius and the Debye shielding radius."

Full sentences may be capitalized

"The experimental results led to one conclusion: The fast electron mode represents an unloading of excess excitons formed during excitation."

but they look kind of stupid—*cme*

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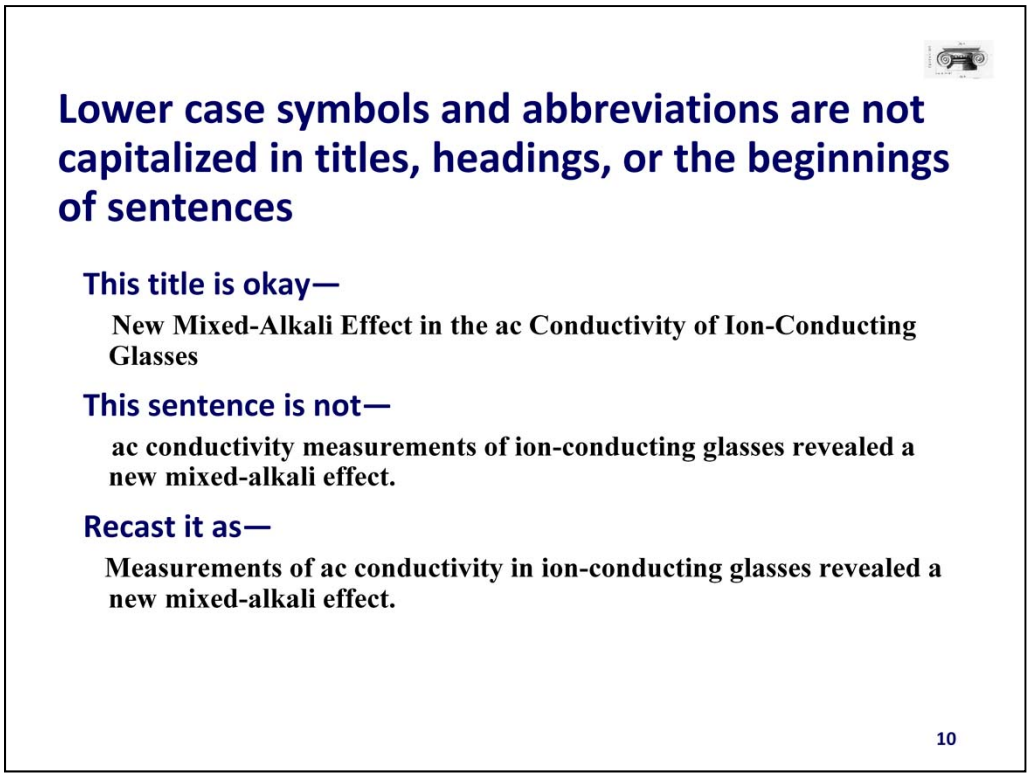
I personally think colons are overused in scientific writing; many times they just provide an excuse for an unwieldy, run-on sentence or title. Colon surgery is highly recommended for such cases.



Ms. P would quibble about this title on general principles, regardless of what is done with the abbreviation. Presumably the "effect" is not "new"—it's probably been there since the elements formed, but nobody ever looked before now. A more accurate title would be "Mixed-Alkali Effect Observed in …"

Some common physics abbreviations are supposed to be written in lower case:

ac (alternating current)

bcc (body-centered-cubic)

cw (continuous-wave)

dc (direct current)

fcc (face-centered-cubic)

ir (infrared)

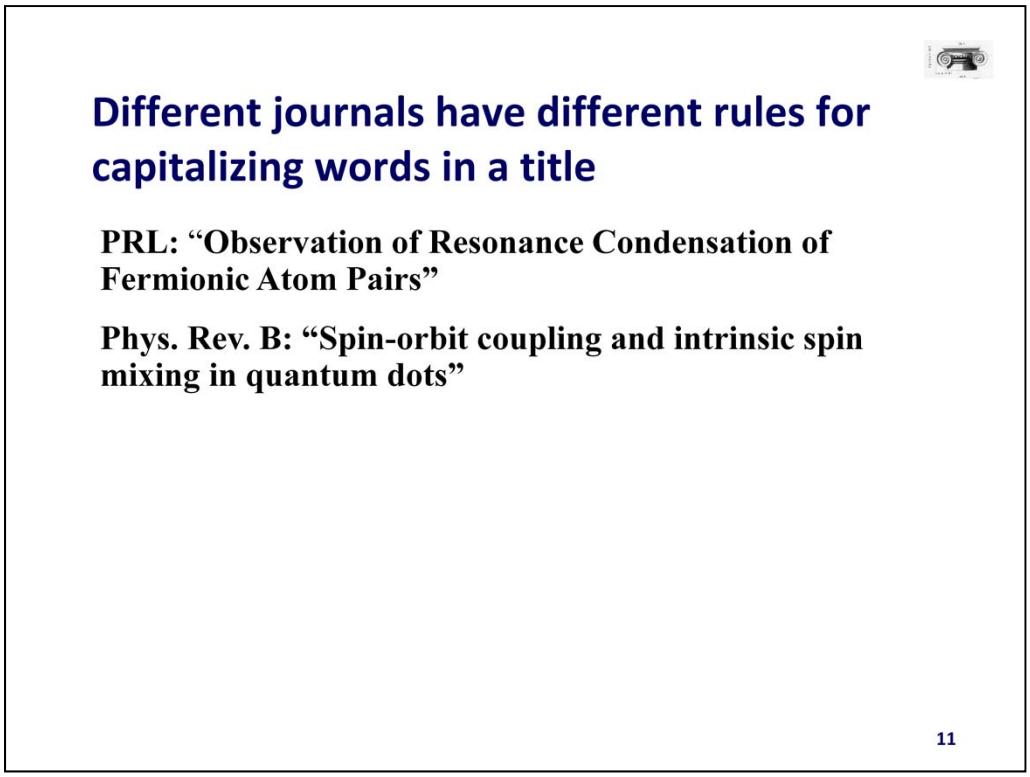
mp (melting point)

rf (radio-frequency)

rms (root-mean-square)

Consult the *AIP Style Guide* for a complete list of standard abbreviations.

We'll talk more about abbreviations and acronyms later today.

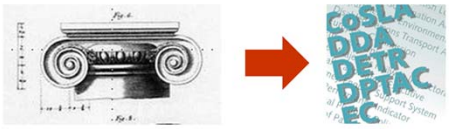


There's no consistency, even among journals published by the same publisher! Just look 'em up.

… and please AvoID ranDom CapiTaLiZation:

"Comments on Likelihood fits with Variable resolution"

Moving right along, now we'll look at acronyms…



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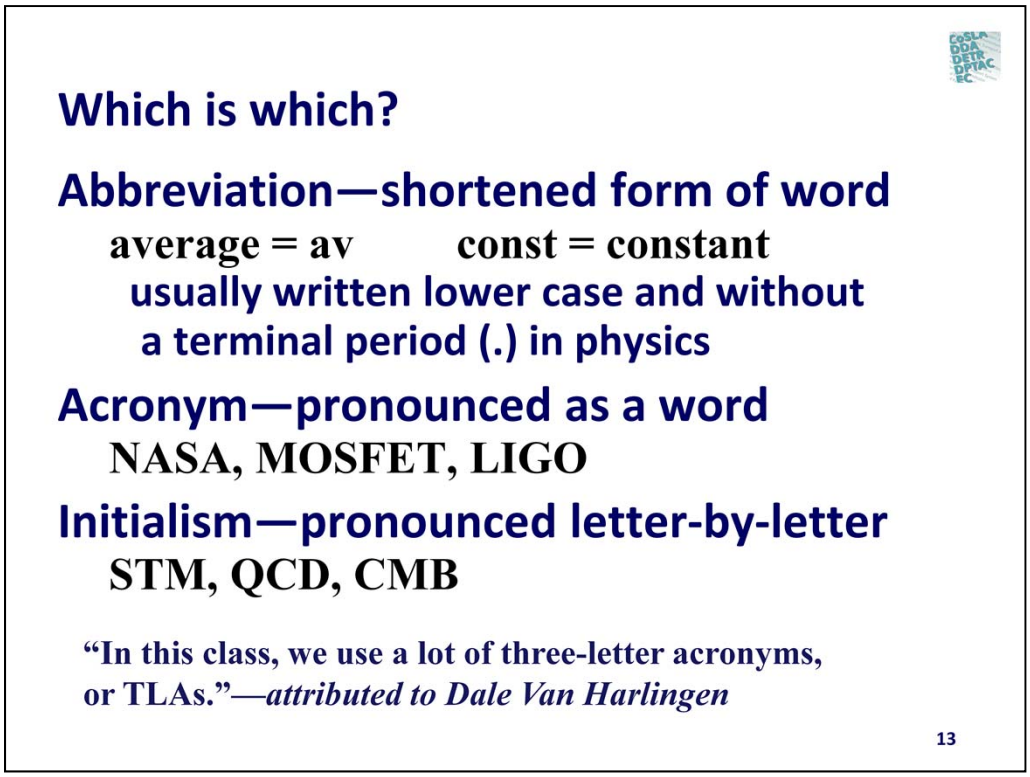
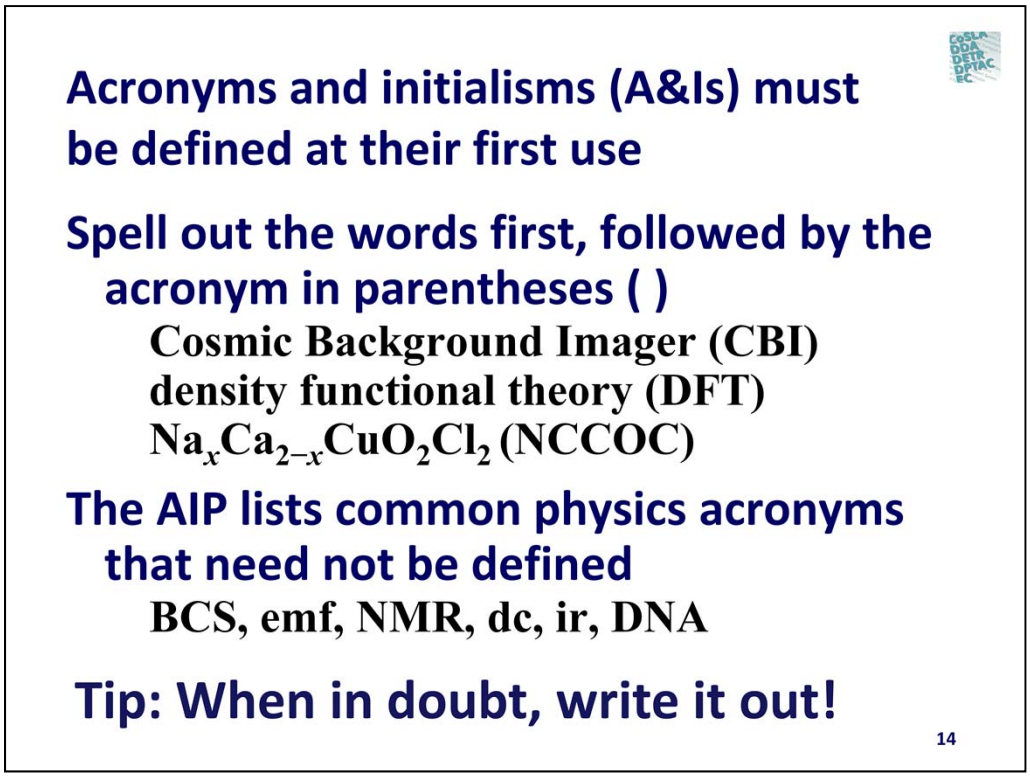
Double-check your titles for random capitalization. Either capitalize only the first word of the title (and proper nouns), or capitalize every word except prepositions (e.g., *in, with, from, by*), conjunctions (e.g., *and, or, but*), and articles (*a, an, the*).

Strive for witless consistency.



While purists make distinctions among abbreviations, acronyms, and initialisms, we'll just call them all acronyms for the purposes of this class.



You can make an acronym out of almost anything that functions as a noun or an adjective in a sentence. Generally, a compound noun or adjective-noun phrase must include at least three words to qualify for acronymization. However, you'll find some common two-word acronyms (e.g., ac, dc, rf) and some acronyms made out of single, very long words (e.g., magnetohydrodynamics [MHD]).

Some acronyms have become so widely used and recognized that they don't have to be defined at first use, but most do. Consult the *AIP Style Guide* (http://www.aip.org/pubservs/style/4thed/toc.html), Appendix D, for a list of standard abbreviations in physics.

When it doubt, write it out.

A sentence may NOT begin with an acronym, 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.

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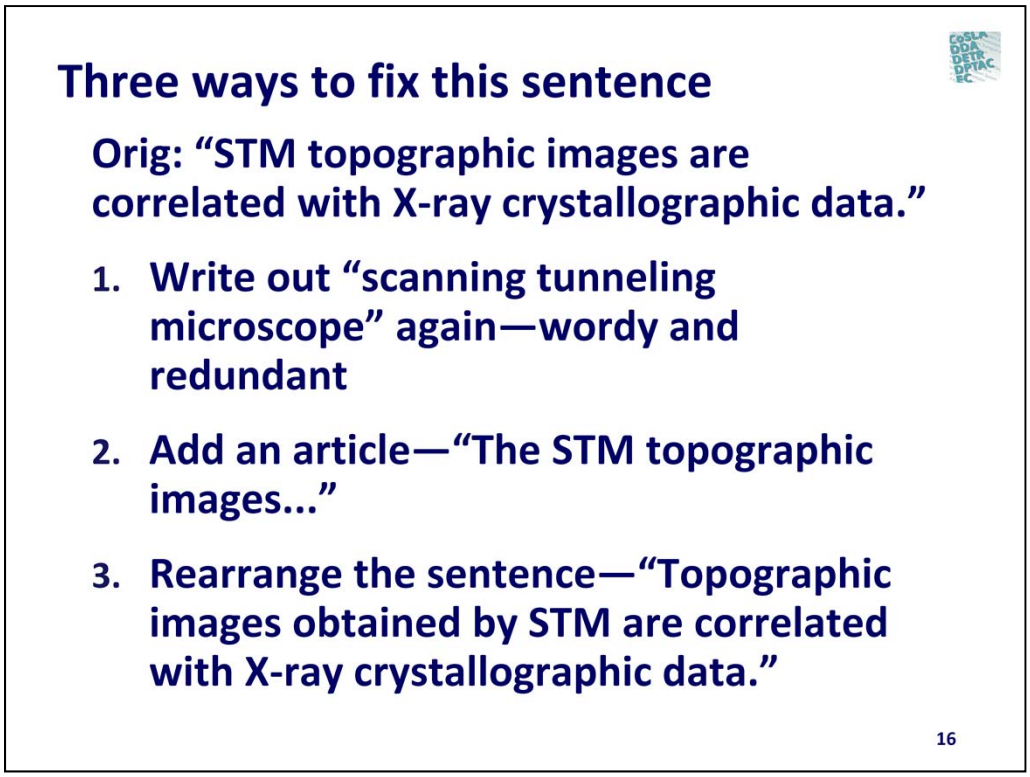
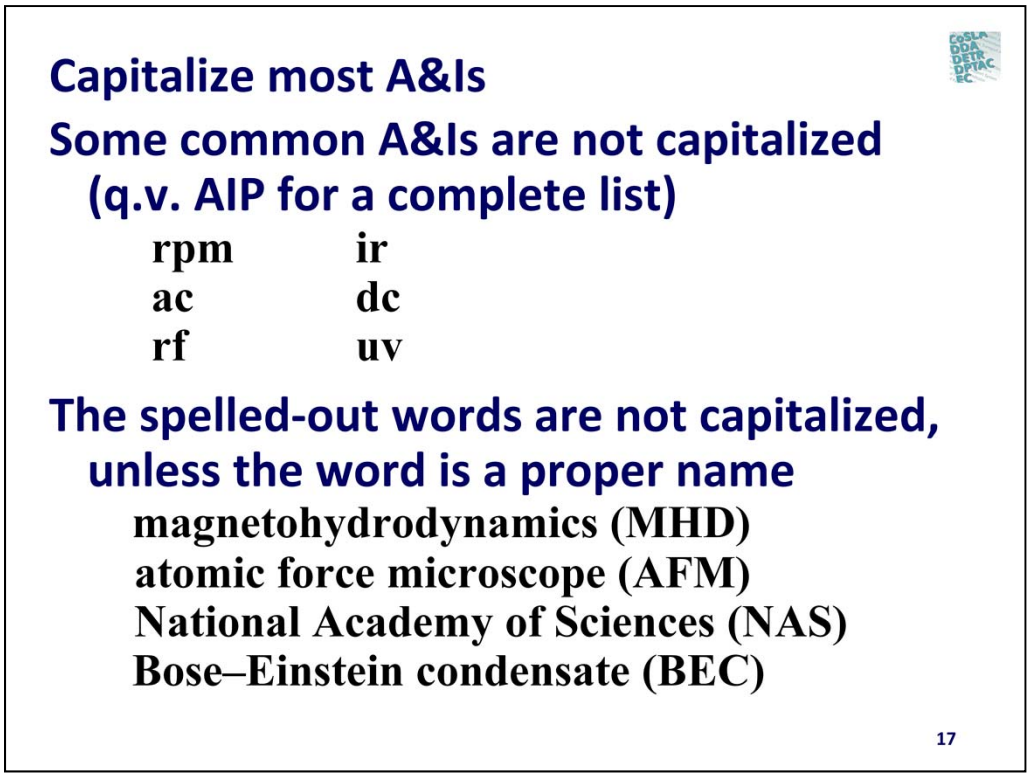


I personally prefer #3, because it emphasizes "topographic images"; the device used is of secondary importance.—*cme*

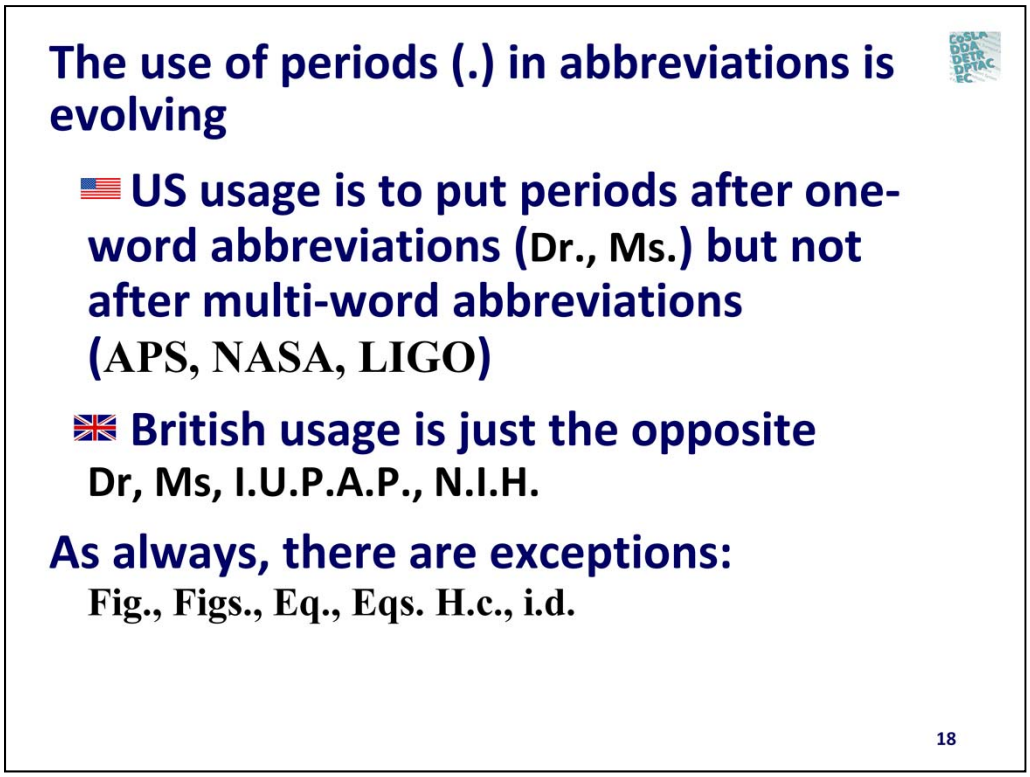
X-ray or x-ray?? Both are used in US English; just pick one and be consistent.

British usage is X-ray.



Most, but not all, acronyms are capitalized. Consult the *AIP Style Guide* for the list; you'll find some surprises.

The spelled-out words that the acronym is made from are written in caps or lower case, depending on normal capitalization rules. So if the word is a proper noun, it's capitalized; if the word is a common noun or other part of speech (usually an adjective or adverb), it's written lower case.

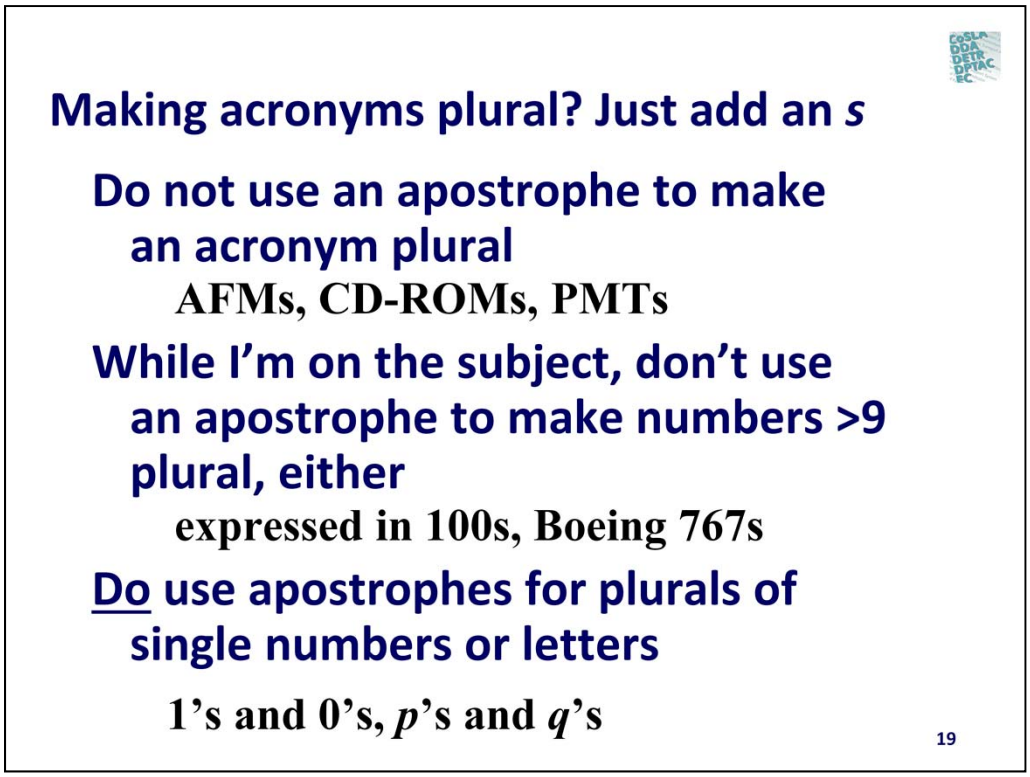


The *Chicago Manual of Style* and the *The CBE Manual for Authors, Editors, and Publishers*, 6th ed., now recommend no periods anywhere.

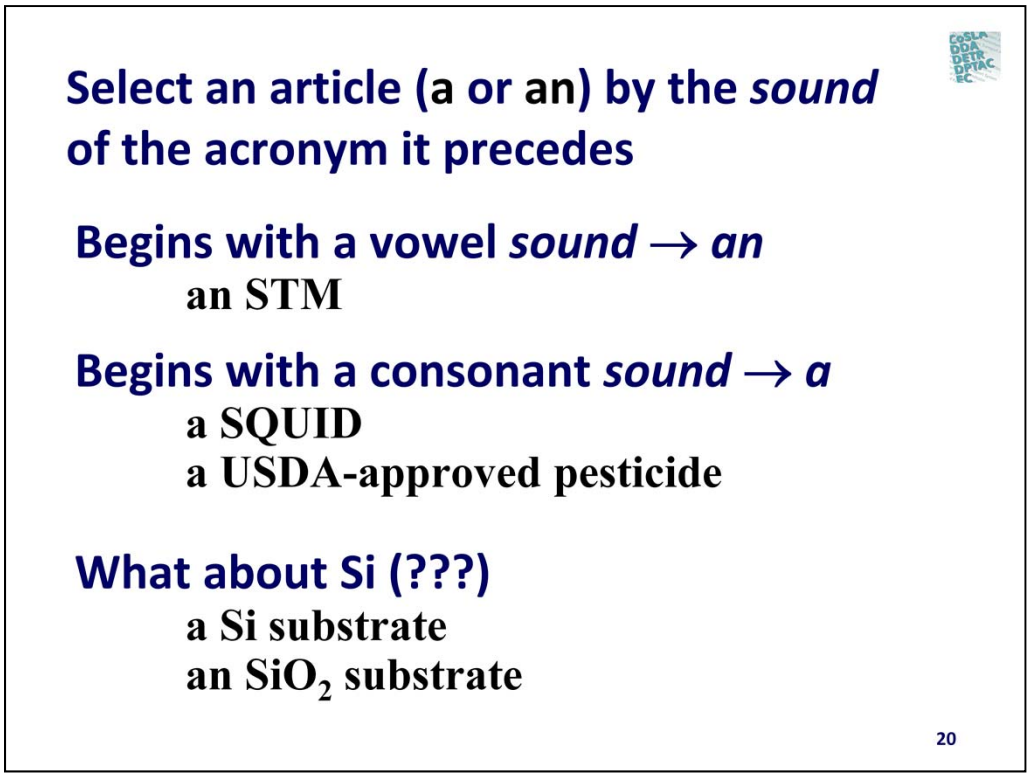
The *AIP Style Guide*, Appendix D, lists the exceptions to the "no periods" rule.

If you're not sure, look it up.

If you're sure, look it up anyway. You will learn humility.



Now would be a great time to review the "Writing Numbers" rules.



How will your reader say the acronym to him- or herself when reading it?