



A scientific style guide

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Why I wrote this guide

Newspapers publish style guides to help their journalists write clearly and consistently and avoid common errors. Scientists need them too. Every year I correct the same errors in MPhys reports, theses, and draft papers. This style guide collates the most common mistakes.

The best way to use this guide is to ignore it and write your first draft as fast as possible. Once you have the draft written, go back and edit it following these rules. Please do this before you send anything to me for feedback. You will save us both time and help me give you better advice.

This guide is based on the [Physical Review Style and Notation Guide](#), which is close to the house style of other major journals.

Avoiding common mistakes

Units

- Units are always in roman font (not italic).
The area was $\sigma = 2.3 \times 10^6 \text{ m}^2$. not The area was $\sigma = 2.3 \times 10^6 \textit{ m}^2$.
- It is essential to get the capitalisation right.
The frequency was 13 kHz at a temperature of 77 K. not The frequency was 13 KHZ at a temperature of 77 k.
- There should be a space between number and unit (see “Spaces” below).

References

The usual convention is:

- Citations use square brackets.
Superfluidity was discovered in ^4He in 1937 [1] and in ^3He in 1972 [2,3].
- Equations use round brackets.
The fitting function is Eq. (4).
- Sections, figures, and tables don’t use brackets, but figure panels do.
Figure 2(a) shows data from the devices listed in Table 3.

Acronyms and abbreviations

- Acronyms should be defined once, at first usage.
The devices were measured using electron spin resonance (ESR).
Element symbols (C, Cu, Cr) and other obvious acronyms (such as AC) don’t need to be defined.
- Acronyms and abbreviations should usually be spelled out at the beginning of a sentence (except for clunky ones, like SQUID).
Figure 1 and Figs. 3-4 show the ESR signal before illumination. Electron spin resonance was not seen after illumination.
- Acronyms are usually best avoided in titles and abstracts.

Capitals

Capitals should be used:

- Everywhere English grammar expects them.
- When referring to specific sections, figures, tables, etc.
 We sealed the samples under different pressures (see Table 1).
- In element abbreviations (H, He).
- In acronyms, usually (SEM, FWHM).

They should not be used:

- In element names.
 Forming gas is a mixture of hydrogen and nitrogen. not Forming gas is a mixture of Hydrogen and Nitrogen.
- When defining acronyms.
 Devices were imaged in a scanning electron microscope (SEM). not Devices were imaged in a Scanning Electron Microscope (SEM).
- In titles, usually (although it's OK if you are consistent).

Italic and roman fonts

Italic font is used:

- As usual in non-scientific English.
- For mathematical variables.
 Here *c* is the speed of light. not Here c is the speed of light.
 We sum over the particle coordinates x_i . not We sum over the particle coordinates x_i .

Roman font is used in all other situations, including:

- In chemical formulas.
 The fullerenes were dissolved in CS₂. not The fullerenes were dissolved in *CS*₂.
- For standard mathematical functions such as sin and ln. (In Latex, write `\sin` etc.)
- In abbreviations and labels, even inside equations.
 The quality factor of Resonator A is defined as

$$Q_A = \frac{f}{f_{FWHM}}$$
 not The quality factor of Resonator A is defined as

$$Q_A = \frac{f}{f_{FWHM}}$$

Spaces

Spaces should be used:

- Between numbers and units.
 The wavelength is $\lambda = 1.55 \times 10^{-6}$ m. not The wavelength is $\lambda = 1.55 \times 10^{-6}$ m.
- Before references.
 The conductance was simulated using the GOLLUM package [1]. not The conductance was simulated using the GOLLUM package[1].

You can avoid line breaks using the Latex non-breaking space `~`, or in Word using Insert → Symbol → Special Characters → Nonbreaking space.

The thermal conductivity is also lower, consistent with the Wiedemann-Franz law [1]. not The thermal conductivity is also lower, consistent with the Wiedemann-Franz law [1].

Punctuation

Commas and full stops should generally be used as in ordinary English.

- Combining equations with punctuation can be tricky. Most writers treat equations as parts of sentences, as follows:

The speed of sound v is held constant across all fits.

The quality factor is $Q = f/f_{\text{FWHM}}$, where f is the centre frequency and we have defined a full width at half-maximum $f_{\text{FWHM}} = f_2 - f_1$.

Maxwell's equations predict that the refractive index of a linear medium is

$$n = \sqrt{\epsilon_r \mu_r}.$$

This leads to the following equation:

$$\frac{D}{\mu} = \frac{kT}{q}.$$

Avoid standalone equations:

The resonance is fitted to the Lorentzian lineshape

$$V(f) = \frac{A}{(f - f_0)^2 + (\Delta f/2)^2}. \quad (1)$$

not

The resonance is fitted to the Lorentzian lineshape given by Eq. (1).

$$V(f) = \frac{A}{(f - f_0)^2 + (\Delta f/2)^2}. \quad (1)$$

- Don't let an equation interfere with the grammar of nearby sentences.

The impedance of the inductor L is

$$Z = j\omega L$$

where ω is the angular frequency.

or

The impedance of the inductor L is

$$Z = j\omega L.$$

Here ω is the angular frequency.

The impedance of the inductor L is

$$Z = j\omega L.$$

Where ω is the angular frequency.

not

Figures

- Every figure needs exactly one caption, even if it has multiple panels (a), (b), (c).
- Choose figure font sizes similar to your main text, and use them consistently.
- When you show a fit, say in the caption which equation it comes from and what the free parameters are.

Writing like a professional

Style that makes you look like an amateur

Some types of writing that are fine in informal usage make you look silly in a formal document.

- Don't be needlessly inconsistent, even in minor details. If you call the phase φ in the text and ϕ in a figure, you waste the reader's effort and undermine their trust. Be pedantic in editing to avoid these errors.
- Don't use a comma where grammar allows a full stop. (This is called a [comma splice](#) and is bad because it usually makes the reader work harder.)

The barrier is aluminium arsenide doped with silicon. Gallium arsenide is used as a capping layer.

The barrier is aluminium arsenide not doped with silicon, gallium arsenide is used as a capping layer.

- Don't start a sentence with "and" or "but", or use contractions like "don't".

Style that makes you look like a professional

This is always difficult, but here is some advice:

- The overriding principle of this guide is that you should work more to let the reader work less. If you make it easy for the reader to understand your simple points, they will try harder to understand your difficult ones. If they are your examiner, your peer reviewer, or your investor, this is probably what you want.
- Good writing is usually concise.
- Figures are often even more important than text; many scientists treat them as the first step of writing.
- Follow Steven Pinker's [13 rules for good writing](#). If you want to motivate yourself to write well, read Chapter 1 of Joshua Schimel's [Writing Science: How to Write Papers That Get Cited and Proposals That Get Funded](#). (Ask Edward to lend you one of his copies.)

Programs to help you

Reference managers

Using a reference manager makes it much easier to organise your bibliography. The two most common are [Mendeley](#) and [Zotero](#). Edward uses the old version of Mendeley ([Mendeley Desktop](#)) which is better than the latest release because it works without an internet connection.

Graphics programs

You have three choices:

- Powerpoint is very fast to learn and a good choice if you are writing an MPhys report.
- Adobe Illustrator generates very professional graphics and edits PDFs natively, but takes a few days to get good at. Edward recommends it for papers and PhD theses. The University has a licence.
- Inkscape is the open-source alternative to Illustrator.