

# The Weichman Lab Writing Style Guide

Marissa L. Weichman

Version 1.0, *last updated January 2024*

While there are no hard and fast rules for writing and there are always special exceptions, following the rules in this guide are a good start. It's important to develop internal habits for writing (and your own pet peeves!) which will get you much closer to a polished product than if you are paying no attention. Our mission is to be formally and technically correct while remaining accessible and readable.

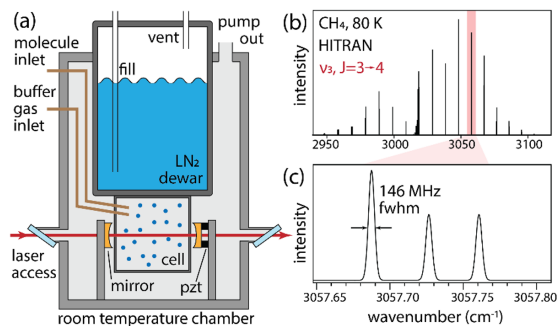
- Be precise and specific.
- Be complete.
- Don't make up jargon. Use words and phrases common to the field.
- Correctly format all non-text items:
  - Numbers
  - Equations
  - Figures
  - Tables
  - References
- Attention to detail, formatting, and typesetting all matter. The reader or reviewer will not want to engage with a poorly-formatted manuscript or one full of typos.
- No two journals agree on reference formats, equation punctuation, section titles, etc. Always start by consulting the style guide for the place where your work will be published.
- In order to learn how to write, read! It's especially helpful to read other papers from our group and papers in the journals you plan to publish in. Take note of authors whose writing you like and use them as a reference point.

- **Use active voice.** Passive voice is wordy and can be confusing. Consider active voice as the default and don't be afraid to use first person.
  - **NO:** Samples were analyzed using high-resolution spectroscopy.
  - **YES:** We analyze the samples using high-resolution spectroscopy.
  
- **Simpler is better.** If you can remove a word, clause, or sentence without changing the meaning of the text, you probably should.
  - **WORDY:** There is an optimal model, which accurately reproduces the experimental data.
  - **BETTER:** The model accurately reproduces the experimental data.
  
- **Sentences and paragraphs should flow logically.**
  - Paragraphs should start with an introductory topic sentence that lays out what the reader can expect the paragraph to be about.
  - Paragraphs should connect nicely with transitional sentences.
  - Sentences within a paragraph should flow nicely with transitional words and sentence structures.
  - Paragraphs should be at least four sentences long. Rewrite shorter paragraphs to include more explanation or integrate them as part of a nearby paragraph.
  
- **Define abbreviations** the first time they are used in a document. If you don't use the term more than once, you don't need to give an abbreviation.
  
- **Use consistent verb tense.** Your paper and your ideas live in an eternal present. Always refer to an experiment or data in the present tense, even if the item in question was completed in advance of writing the paper.
  - **NO:** We **prepared** solutions by dissolving precursor into neat liquid chloroform.
  - **YES:** We **prepare** solutions by dissolving precursor into neat liquid chloroform.
  - **NO:** Our simulations **reproduced** the experimental data.

- **YES:** Our simulations **reproduce** the experimental data.
- **Be consistent with hyphen usage.** Hyphenate compound adjectives, but not compound nouns.
  - **NO:** We examine the effects of vibrational strong-coupling on cavity coupled molecules.
  - **YES:** We examine the effects vibrational strong coupling on cavity-coupled molecules.
- **Don't use a hyphen when you want a minus sign,** particularly in exponents and in inverse units like wavenumbers:
  - **NO:** The peak is split by  $7.4 \times 10^{-2} \text{ cm}^{-1}$ .
  - **YES:** The peak is split by  $7.4 \times 10^{-2} \text{ cm}^{-1}$ .
- **Avoid parenthetical clauses.** They are informal and break the flow of your writing. If something is worth including in parentheses, it is worth explaining clearly in its own sentence.
- **Use a comma before most coordinating conjunctions.** A conjunction (and, nor, but, or, yet, so) is coordinating if it connects two clauses that could each be their own sentence without the conjunction present.
  - **YES:** The data is noisy, and it therefore needs to be processed.
  - **YES:** The data is noisy and therefore needs to be processed.
- **Use the Oxford comma** in lists of three or more items.
  - **NO:** The Weichman Lab studies spectroscopy, chemical physics and molecular dynamics.
  - **YES:** The Weichman Lab studies spectroscopy, chemical physics, and molecular dynamics.
- **Avoid run on sentences.** Run-on sentences include more than two independent clauses. A clear sentence usually has at most two independent clauses connected with coordinating conjunctions. You can use semicolons or colons to break up run-on sentences. Or better yet, reword them into separate sentences. Periods are free!

- **Make sure subjects agree with verbs.** This point may seem obvious, but it is easy to make a mistake in long sentences. Find the subject and match the verb to it.
- **Don't use ambiguous pronouns.** Follow “this” and “these” with a noun.
  - **NO:** We observed Rabi splittings on the order of 450 MHz. This is orders of magnitude smaller than the relevant molecular vibrational and rotational energy scales.
  - **YES:** We observed Rabi splittings on the order of 450 MHz. This collective cavity-coupling strength is orders of magnitude smaller than the relevant molecular vibrational and rotational energy scales.
- **Report numbers with the appropriate significant digits.** Spell out numbers when they are smaller than 10 or if they refer to an abstract concept rather than a measurement.
  - **YES:** There are three reasons for the selection of this model.
  - **YES:** There are 15 sources of error in this model.
  - **YES:** The length of the cavity is 3.0 cm.

- Figure captions should be neatly formatted and contain sufficient information to understand the contents of the figure with minimal reference to the main text. A figure caption belongs below the figure.



**Fig. 4** | (a) Cryogenic buffer gas cell used to prepare a cold, dense molecular sample. A Fabry-Pérot optical cavity encloses the cell to achieve *in situ* strong coupling. (b) Overview of the  $\nu_3$  band of  $\text{CH}_4$  simulated at 80 K using HITRAN data. (c) HITRAN data for the targeted  $\nu_3, J=3 \rightarrow 4$  transition of  $\text{CH}_4$ , illustrating the inhomogeneous Doppler linewidth at 80 K.

- Likewise, table captions should be neatly formatted and contain sufficient information to understand the contents of the table. Column headings should be labeled clearly and specify units. The table caption belongs on top of the table.

**Table 1:** Fitted spectroscopic parameters of Eq. (6) for the R branch. The residuals (Fig. 4B) have a small root-mean-square error of  $7.4 \times 10^{-5} \text{ cm}^{-1}$ , slightly larger than the  $1\sigma$  line-center measurement uncertainty of  $2.5 \times 10^{-5} \text{ cm}^{-1}$ .

Parameter	Value ( $\text{cm}^{-1}$ )
$\nu_0 + (2\bar{B} + \Delta B)(1 - 2\zeta)$	1184.86196(3)
$2\bar{B}(1 - \zeta) + \Delta B(2 - \zeta)$	0.0078300(3)
$\Delta B$	$-2.876(6) \times 10^{-7}$