The A&A language guide for authors

1 Introduction

This short language guide is designed to help you meet A&A standards when you are preparing your paper and to understand the changes that the A&A language editors (LEs) make to your manuscript (MS). Please see the editorial on language editing for a more extensive explanation of our editing goals (A&A 490, E19).

1.1 Scope of this language guide

This guide is based on the kinds of changes the LEs recommend most often in A&A papers, so it does not pretend to be a complete English language guide. For instance, common language errors that we only see at times are not included in the explanations because they are explained in other general grammars, dictionaries, and handbooks.

The LEs strive for consistency in editing those MSs selected for language editing. Nevertheless, there will always be variations in the English found in the Journal as a whole. This occurs because there is often more than one way to construct a phrase or sentence or even to correct a grammar problem.

A few matters that are not directly language concerns, but rather conventions in use at A&A are explained in the following sections.

1.2 A&A house style

The following A&A conventions are enforced by LEs:

- **A&A aims to maintain a formal register (style) in the body of the paper.**

  This includes the following:
  - Do not contract two words: replace “don’t”, “can’t”, “won’t”, “it’s” by “do not”, “cannot”, “will not”, “it is”, etc.
  - Avoid addressing the reader directly in the imperative:
    - ✗ “Note that the data were...”
    - ✓ “The data were...”
    - ✓ “We would like to point out that the data were…”
    - ✓ “We note that…”.
  - Write out figures when lower than eleven and not directly used in a measurement with the unit following: e.g., “five years” and “5 yr”.

- Use the full terms for many abbreviations when in the running text, such as "e.g.", "i.e.", or "w.r.t". The handy signs used in note-taking and between colleagues in meetings (e.g., slashes, the ampersand) should be avoided in the main text.
  - ✗ "mounted at the ESO/VLT@UT1 telescope"
  - ✓ "mounted on the Unit 1 telescope (UT1) at ESO's VLT".

- **Only the first word of a heading should be capitalized, along with proper names.**

For example, "Sect. 5. Discussion and conclusions", and abbreviations should be avoided. Also see Sect. 5.3.1. for other examples.

- **Italics for indicating emphasis are discouraged.**

- **Date format needs to be consistent within the text of a single paper.**
  The following choices are allowed:
  - 4 January 2004 or 4 Jan 2004; January 4, 2004 or Jan 4, 2004;
  - 2004 January 4 or 4 Jan 2004.

We ask that the cardinal endings be left off for dates because it is informal style and that the month be written out, since 4-1-2004 is ambiguous between cultures, and it too is informal inside the text.

- **The tilde symbol (~) is used to mean "approximately" before measurements (~ 5 yr) but not before actual words.**

The tilde is useful to avoid wordier synonyms like "on the order of", which should only be used for measurements with figures, not for a general noun ("on the order of 10 Gyr" not "on the order of the age of the star"). The related symbol "≈" should be reserved for mathematical expressions, rather than used as an alternative to the tilde.

1.3 Adjustments to the Abstract and captions

1.3.1 Abstract

The LEs revise any incomplete sentence used after a heading.

✗ "Aims. Investigate stars." *should instead be written as*
✓ "Aims. We investigate stars." *or as*
✓ "Aims. We aim to investigate stars."

Since abstracts are supposed to be self-contained, LEs suggest substituting most citations of earlier work with other wording.

✗ "Two transverse profiles are distinguished, one being the generalized Epstein distribution (profile E) and the other (N) proposed recently in Smith et al. (2012)"
✓ "Two transverse profiles are distinguished that we call Profiles E and N."

The required sections are Aims, Method, and Results, even if you choose not to use the headings. If the content of a section is missing or if it contradicts the headings, LEs point it out and suggest an adjustment. See the editorial on Abstracts from when A&A introduced the structured abstract. (A&A 441, E3)

1.3.2 Captions to tables and figures

In line with A&A conventions for captions and with the "Paper organization" page for authors [http://www.aanda.org/author-information/paper-organization], the LEs ask you to remove any article (A, An, The) at the beginning of the caption, legend details in the body of the text that repeat information in the caption, or any discursive language or information (e.g., results) that do not directly explain symbols in the figure.

We also adjust the caption to resemble the expected style: e.g., the first phrase should not be a full sentence, or notes to tables should resemble footnote style, not that of the running text.

1.4 Suggested resources

1.4.1 Guidebooks from other scientific disciplines and laboratories

These guides follow the same principles as A&A, so you can use them for most questions, even if their examples come from their disciplines. These include

- CHEMISTRY: *The ACS Style Guide: A Manual for Authors and Editors*, Second Edition, edited by Janet S. Dodd. Its sections are: Getting Started, Writing Style and Word Usage, Components of a Paper, Types of Presentations, Advice from the Authorities.
- BIOLOGY, the biology department at Columbia University: *Writing a scientific research article* [http://www.columbia.edu/cu/biology/ug/research/paper.html] Its main sections are found under "Format for the paper" and "Edit your paper!!" Both of these repeat in detail what language editors are looking for when editing your papers, so you can see there that we are not being any more rigorous than others are.
- NASA – Langley Research Laboratories guide for authors presenting reports by Mary McCaskill [http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19900017394.pdf] This is the fourth NASA URL found for this resource, so if it does not work (again), try to find it by a search engine using the title and author; otherwise, consider the following list of English for science resources to complement those here.
- Guide to Grammar and Writing is a resource by Capital Community College in Hartford Connecticut. [http://www.ccc.commnet.edu/GRAMMAR/]
- The latest edition of *The Chicago Manual of Style*, Chicago University Press. This extensive manual is used by most scientific communities in the United States, including psychology. It may be too technical and detailed, when most of what you need is on the A&A site. The book itself is bulky, but it is possible to subscribe to it online to access all its sections (including the style guide) and even to ask specific questions of its staff of editors.

1.4.2 Other online resources for scientific writing and writing in general

- Madison Wisconsin Writing Lab for Scientific Reports, including suggestions for each of the six parts of a paper (or scientific report). [http://www.wisc.edu/writing/Handbook/ScienceReport.html]
- A list of common errors and advice by a professor of English at Washington State University, Paul Brians. [http://www.wsu.edu/~brians/errors/] It tells you it is meant for native English speakers, but there is much that can help everyone. He also gives a list of sites specifically for second-language English writers.
- Dictionaries: http://www.merriam-webster.com
  http://dictionary.cambridge.org/dictionary/english/
  http://www.oxfordlearnersdictionaries.com/definition/english

2 Consistency and spelling matters

Consistency in punctuation, capitalization, spelling, hyphenation, and abbreviation is essential to maintaining the highest standard possible in any journal. Typical corrections for consistency include the following: halos/haloes; online/on-line/on line; 3D/3-D/3 D/ three-dimensional; versus/vs./vs/v/against; the serial comma in lists (as recommended by A&A for clarity: see Sect. 3.1.3); hyphenation or merging of prefixes.

The author must choose between these possibilities for the whole MS, even if all are correct.

2.1 US vs UK conventions

The inconsistency that we have to correct most is the mixture of American (US) and British (UK) spelling and conventions in the same MS, so the chart below indicates which form belongs to which set of conventions out of the words that we see most often.

UK spelling conventions	**US spelling conventions**
-OUR endings: behaviour, neighbour, favour, colour, harbour, vapour	-OR endings: behavior, neighbor, favor, color, harbor, vapor (NB, but "contour" since pronounced /oor/)
-RE endings: centre, metre, fibre, calibre	-ER endings: center, meter, fiber, caliber
-SE endings on some verbs (less often for scientific terms) or -ISATION on nouns. analyse, summarise, organisation, ionise, etc. It is possible to use IZE/IZATION but only if consistent[1]	-ZE on the same verbs, IZATION on the nouns: analyze, summarize, organize, ionization, to practice ISE verbs in both languages: advise, surprise, supervise, comprise

1 The IZE/IZATION choice is acceptable in UK conventions (except for "analyse"), but once the ISE/ISATION endings have been chosen in a UK MS, then it should be used consistently with

to practise (noun=practice, e.g., in practice)	
-DS/ST adverb endings: towards, outwards, amidst, amongst, whilst (OK amid & among)	Few if any of these are used in US spelling.
Generally doubled consonants on suffixes: modelled, labelling, travelling, cancelling, cancellation	Single consonant for suffixes if pronunciation does not change: modeled, labeled, traveling, canceling, cancelation
Hyphenation: on-line, non-zero, north-east, south-west, multiwavelength, redshift, ultraviolet, infrared. If any of these are merged, then they must be consistent and used for both adjective and noun forms.	Usually merged, not hyphenated: online, northeast, southwest, nonzero (not strict for the non- prefix), multiwavelength, but pre-existing, non-negligible since the last prefix letter is repeated in the root noun.
-LOGUE ending: catalogue, analogue, isotopologue	-LOG ending: catalog, analog, & isotopolog (the –gue is still seen, but be consistent)
Other words & expressions: of the order, in the order of brackets & square brackets further (accepted for distance, but not preferred) autumn, artefact, ageing, grey, speciality, sulphur, aluminium, to orientate, to fulfil (but fulfilled), to inquire, near to, opportunity to do (or possibility)	**Others:** on the order of parentheses & brackets Stricter on the difference of farther for physical distance & further for more figurative uses. fall, artifact, zero, gray, aging, specialty sulfur, aluminum, to orient to fulfill, to enquire near, opportunity of doing (or possibility)
Punctuation: commas need not be placed around “e.g.” or “i.e.”, or should be used consistently if chosen; fewer commas can be used for introductory phrases and between sentences, but are needed if ambiguous without them.	**Punctuation:** commas surround “e.g.” & “i.e.”, as for their full forms in the running text: “(see, e.g., Newton 1687)”; commas are used more consistently for introductory phrases & between full sentences with connectors.

2.2 Hyphenation or merging

There are rules about when to hyphenate, when to leave something separate, or when to merge. Some are fixed rules, others vary between the US and UK dialects, and still others can vary depending on whether it is ambiguous with or without the punctuation or merging. The policy is that once you use a form, you must be consistent with it unless there is an exceptional reason for

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one exception: all endings use the S except for the technical words (e.g., ionize, parametrization), if the author prefers.

a change.

2.2.1 Word-forming prefixes

Both UK and US dialects use merged and hyphenated word forms. The US spelling tends to merge common prefixes on compound nouns or adjectives, and the UK spelling is more likely to hyphenate (e.g., multi-, over-, non-). A good dictionary will give the spelling and variants, but A&A requires consistency within the same paper. LEs will always attach any prefix that is separate from the root word:

✗ "non relational database"

✓ "non-relational" or "nonrelational".

Hyphenated in both dialects are the following:

- Compounds where the second element is capitalized or a numeral:
  - ✓ "exo-Earths", "pre-1914";
- Compounds where the last letter of the prefix is the same as the first letter of the root word:
  - ✓ "non-negligible";
- Compounds in which the second element consists of more than one word:
  - ✓ "pre-main sequence star" or "pre-main-sequence star". (Only the second hyphen is optional, since it is now an established pair.);
- Compounds that must be distinguished from homonyms:
  - ✓ "un-ionized", "re-creation".

2.2.2 Strings of adjectives with compound nouns or adjective noun pairs

When there is more than one modifier before a final noun, then commas or hyphens may be needed to clarify the relationships of the different modifiers before the noun, whether to each other or to the noun.

When there are several adjectival words or phrases, each one referring directly to the noun and not to the other modifiers, then commas are used to separate them by replacing the "and" that is implied.

✓ "It is a light-weight, battery-operated, fully ambulatory physiological monitoring system" (taken from p. 140 of *Minimum Competence in Scientific English*, nouvelle édition, by S. Blattes et al., Grenoble Sciences and EDP Sciences, 2003).

The more noun modifiers used in a noun phrase, the more this punctuation and spelling are needed, since it is difficult for the reader to tell when the final noun has arrived. Another clue is whether the noun modifiers have no plural S, though the plural meaning is likely (Sect. 5.2).

✗ **"**This modification involves a cluster mass dependent gas mass fraction." (Does this correct to "a cluster's mass-dependent gas-mass fraction" or something else?)

There can also be too many such modifiers, however, so that some phrases need to be expanded back to the standard prepositional forms.

✗ **"**covering a wide age-distance-metallicity-position-density parameter space."

Should this be ``covering a wide parameter space of ages, distances, metallicities, positions, and

densities"?

If there are too many noun or other modifiers preceding the final noun, so that it becomes very confusing, then some of these phrases could be changed back to an expanded form.

✗ "electrically conducting ionized gas particles"

✓ "ionized gas particles that conduct electrically"

✗ **"**with observational evidence of quasar feedback quenching star formation at high redshift" (It is hard to tell whether "quenching" is a noun with "quasar-feedback quenching" or "quenching of quasar feedback", or is it meant as a verb here, that is, "quasar feedback that quenches"?)

2.2.3 Compounds with a participle modifying a noun that follows it

✓ wide-spread theory, decision-making procedure, hard-working student, remote-controlled detector, star-forming region (but "star formation region").

2.2.4 Some exceptions

- Once a noun pair has become widespread, then the hyphen is no longer needed to avoid ambiguity, except in very long noun phrases with a string of these modifiers (see example at the end of Sect. 2.2.2): e.g., "main sequence star".
- The comparative and superlative adjective forms are not hyphenated unless the reference is ambiguous:
  ✓ "low-mass star", but "lower mass star" or "lowest mass star".
- Two-word Latin terms are neither hyphenated nor italicized:
  ✓ "an ad hoc formula".

3 Punctuation

3.1 Commas

Commas often make a difference in meaning, but also help to make reading smoother by clarifying the relationship between ideas. They should not be inserted randomly in a phrase that expresses a single idea. This often occurs in some papers before prepositional phrases, especially beginning with "with", and should be avoided unless there is a very clear and definable reason for that comma.

✗ **"**We used both, X and Y" *should be* ✓ "We used both X and Y"

✗ "Two important physical features that are to be constrained by the model are the extent of the disk, and the presence of a halo." (The list only has two items.)

✓ "…model are the extent of the disk and the presence of a halo."

✗ **"**Smith detected five sources, with strong X-ray signals, with one confirming that…"

✓ “detected five sources with strong X-ray signals, with one confirming that…” (The comma signals that a dependent verb phrase follows.)

3.1.1 Commas between two separate thoughts in one sentence

Use a comma between two separate thoughts in a sentence (i.e., each thought has its own subject and verb) that are joined by connecting words: and, or, nor, but, for, so. You can omit the comma if these thoughts are short and the relationship clear because of the connector.

✓ “Superficially interpreting statistics may lead to false conclusions, but altering any statistic or leaving out contradictory evidence is much worse.”
✓ “It becomes optically thick and the adiabatic phase sets in.”

The comma is left out when the two sentences share the subject:
✓ “We depend on statistics but do not always know how to use them.”

Omitting the connecting word creates run-on sentences (especially if there is no punctuation between two thoughts) or comma splices (splicing two thoughts together with only the punctuation: commas or semicolons), which might confuse readers because they cannot tell where the first idea ends and the second begins, or else they can only guess at what the relationship between those ideas might be.
[http://grammar.about.com/od/rs/g/runonsentenceterm.htm]

✗ **“**Superficially interpreting statistics may lead to false conclusions, altering any statistic or leaving out contradictory evidence is much worse.” (See the example above with “but”, or divide this one into 2 sentences.)

3.1.2 Commas after introductory phrases

It is clearer to use a comma after introductory phrases of more than three words. If the phrase has fewer words, the comma is optional, but the final sentence must not be ambiguous. It is also needed when there are several numbers and symbols in that part of the sentence.

✗ **“**As previously emerging radiation spectra are calculated for a radius of the scattering cloud equal to the Bondi radius."
Does the author mean "As previously, emerging radiation spectra are calculated…” or "As for previously emerging radiation, spectra are calculated…”; or could this be a fragment that introduces the next sentence?
✗ **“**For the magnetic spot distribution with rsp = 10∘illustrated in Fig. 2 *nz* gradually increases.”
Does the comma belong after “spot” or “Fig. 2”?

Inverting the normal order of the English sentence is acceptable if not used too often. There should be a reason for it, such as for transition or rhetorical emphasis, rather than simply for varying the syntax. A comma is also required in this case, even if it is technically part of the main

idea, precisely because it is not in its normal position. See Sect. 6.2.1 for a warning about dangling participles (modifiers using verb forms: present or past participles).
✓ "The value of *nz* gradually increases for the magnetic…."

3.1.3 Serial commas in lists

At A&A, as for most technical and scientific writing, a comma precedes the "and" or "or" before the final item in a list of three or more to avoid ambiguity:
X, Y, and Z
X, Y, or Z
W, X and Y, and Z

3.2 Punctuating dependent clauses and phrases

3.2.1 Nonessential sentence parts (i.e., nondefining or nonrestrictive)

Commas are generally used around parts of the sentence that are not essential to the main idea (e.g., additional information about what the idea refers to) or parts that have been added for emphasis or as a transitional indicator. In contrast, a comma should not be used randomly in the middle of a sentence where it can lead to confusion (e.g., before a prepositional phrase that is part of the main idea of the sentence, see Sect. 3.1 above), and they are never used within the structures "either X or Y" and "both A and B".

✓ "The S/N is higher when, as shown above, the…"
✓ "The Galaxy, which is rich in metals, has a thin disk." (The information between the commas is not the topic of the sentence even if it is useful in the wider discussion.)
✓ "plotted above the original, with colors brightening with time." (This gerund clause with "with" needs a comma, whereas "with" as a preposition for a simple noun does not use a comma: "…plotted above the object with the bright colors" as in the examples under 3.1. above.)
✓ "The HeII and OIII lines in ϵ Ori do not vary, while HeI 4026 and HeI 4713 do." ("While" is used for contrast here before another full sentence, so there is a comma. However, if the intent is to say they do these things at the same time, as in the example in 3.2.2--one varies at the same time as the other does not--then there'd be no comma, since they go together.)
✗ "Discovering whether the polluted population appears redder than the counterpart, depends on the photometric filter combination used." (The comma separates the subject--the noun phrase "Discovering...counterpart"--and the verb "depends on").
✓ "The halo temperature is between a few 10K and 100K, which is warmer than the molecular cloud but colder than the diffuse ISM." (If you can change "which is" to a new sentence beginning with "This is", then it is neither defining nor restrictive.)

3.2.2 Essential sentence parts (i.e., defining or restrictive)

Commas should not be used around dependent clauses that are essential to the main idea of the sentence, for example, when the dependent clause contains the information required for identifying the noun it refers to (defining or restrictive, see an explanation of adjective phrases in http://grammar.about.com/od/basicsentencegrammar/a/adjclause.htm).

✓ “The Galaxy has a thin disk that is rich in metals.” (Metallicity is the point of the sentence, so using “that” implies that there are disks that are not metal-rich.)
✓ “The observations were secured while the object was in eruption.” (The adverb phrase is essential to the meaning.)
✓ “This occurs because there is often more than one way to construct a sentence.” (This guide, Sect. 1)
✓ “We thank the anonymous referee for the useful comments that improved the manuscript.” (Grammatically speaking, the comments improved the paper, but using “which” and a comma implies that some comments did not improve the MS.)

For the relative pronoun, A&A prefers “that” over “which” to make the defining adjective connection to the subject very clear, even in MSs using British conventions. There is never a comma before “that” as a result, unless the reason comes from something else in the sentence or it is being used in another sense. [http://grammar.about.com/od/punctuationexercises/a/Practice-In-Punctuating-Adjective-Clauses.htm]

3.3 Colons and semicolons

A colon is a way to introduce one or more illustrative examples, especially in a list. It should not be used for any other connections between ideas, as a semicolon might be. To separate the items in the list, use commas between simple items (no commas in the phrase) and semicolons between complex ones. If a capital letter follows the colon, it signals that what follows amplifies the first sentence and is another full sentence.

✓ “… as follows: the Earth, the solar system, and the Galaxy.” The complex formulations look more like “… as follows: the Earth, but not the Moon; the solar system and all its planets; and finally the Galaxy, which is a member of the Local Group.”

Use a semicolon between two related sentences when one or both of them is complex and contains one or more commas.

✓ “The optical/UV spectra of FSRQs are characterized by the presence of prominent broad and narrow emission lines; instead, BL Lacs are dominated by continuum emission in the optical band.”

3.4 Punctuation with equations

Punctuate all equations according to their function in the sentence, whether in the running text or separated in the layout. If the equation ends its sentence, then it is followed by a period (full stop), even if separated in layout.
A colon is only used when it is the illustration of what is in the sentence and when the sentence ends after the equation or just after the explanation of the variables. Since equations are part of their sentences, there is never a colon after “as”, a verb, or a preposition, because the equation is the object of each.

✓ “The sum is calculated as follows: A+B=C.”
✓ “The sum is calculated as

A+B=C. Eq. (2)”

3.5 Parenthesis (brackets)

Placing additional information in parenthesis is acceptable as long as it is not done frequently. Excessive use of parenthesis in one sentence often indicates that the sentence should be split up into two sentences or more, and it is awkward to have more text in parenthesis than in the main sentence.

Likewise, placing essential information in parenthesis is counterproductive to your message, and this includes when more precise information is given there rather than in the sentence: “This percentage is high (> 40%)” is more precise, hence clearer, when written as “This percentage is higher than 40%”.

Avoid parentheses when using a comma or including it in the main sentence would suffice.
✗ “We observed these stars for 24 hours (which did not include breaks to eat and sleep).”
✓ “We observed these stars for 24 hours, which did not even include breaks for eating and sleeping.”
You may use the same phrase but as a second sentence in parenthesis, punctuated as
✓ “We observed these stars for 24 hours. (This did not even include a break for eating and sleeping.)”

Avoid parenthesis within parentheses, except when it is part of a formula. This includes the year in a reference that is placed in parenthesis, where we also prefer no comma between the name and year, but do expect the period after “et al.”: (Johnson et al. 1999). When the name is in the text, only the year is placed in parenthesis. See the author information pages for more on citing in A&A.

3.6 Slashes

This sign is used first and foremost to indicate a ratio and secondly to replace “or”. Using it instead to imply “and” or even “and/or” is incorrect and leads to greater ambiguity: Which of the three is really meant? In the main text of formal writing, precision requires avoiding its use altogether except for the ratio, and then if used, make certain that “or” is the only possible replacement if written out.

✗ “This shows asymmetry between red/blue” is therefore incorrect because clearly “and” is the intended relation, not “or”. This is much too informal, note-taking style for the running text.

4 Verb tense and voice

4.1 Present tense

Use the present tense for statements of fact and general truths, for a set of steps in a method (not for the specific steps used when testing or gathering data published in the paper), and for any results, discussion, and conclusions that are set out in the paper itself.

Time markers for the present include "now", "usually", "often", "currently", "at present", but the context will also indicate the time frame.

✓ In the usual reduction procedure, data are flux-calibrated and dereddened.
✓ Our data were then flux-calibrated and dereddened. (Specific actions taken and completed in the past.)

As opposed to the "present simple", there is seldom need for the present continuous (progressive) in science writing, since the work was done earlier, not while actually writing. One exception might be if you are describing an ongoing project that began before and continues after the time of writing.

✓ "You **are** not **simulating** and **getting** the results right now."
✓ "The satellite's spectrometer is measuring….in orbit."
✓ "When assuming trailing spiral arms, the northwestern side of the nebula is nearest to us, and the galaxy is rotating counter-clockwise." ("rotates" is correct, too.)

4.2 Present simple and present perfect

The present simple and present perfect are both used to refer to what is said by others in their papers, but what they did in the research itself can be in the simple past, as explained below. Avoid using the present for your work and the past tense for others' work in a paper, because it may suggest that theirs is not correct or out of date.
We can accept the simple past for what is said in papers from 2000 and earlier, but that is not the usual English convention for anything said in a book or article.
Time markers for the present perfect include "just", "recently", "already", "ever", "never", "since" with a precise date, "for" with a time duration up to the present.

✓ "Smith et al. (2010) [have] studied… They conclude that… We did a similar study."

4.3 Simple past vs present perfect

The simple past is used for events that occurred and were completed in the past, whereas the present perfect implies a continuation into the present of that action or a recent change that has a connection with or is important in the present: e.g., "I now explain the new technique that has been developed." (developed in the past but important now because being explained).

In a research paper, the past is used for your actions (e.g., research) that were completed before writing began (observations, calculations, tests of models), so this tense is appropriate for the methods sections of the abstract and paper. You also need to use it for the summaries of what is said earlier in a paper, making it appropriate in the last section.
Time markers for the simple past include any phrase that indicates a past and finished time or time period: "In 2009, we observed…", "Five years ago, we presented this idea at a colloquium in…" The context may also indicate an action completed in the past.

✓ "This paper has shown that…"
This can begin the summary section, but subsequent sentences for what was done in the paper should be in the simple past, with a few exceptions, especially in UK English: "We have investigated…Our analysis proved…We discussed…" All the results, in contrast, are given in the present tense.

4.4 Alternating tenses

You may move between tenses, when needed, but the change in time frame must be made clear by a change in situation or by a ``time marker", that is, a phrase to indicate a switch in time frame (underlined in the example below, which was adapted from p. 77 of *Minimum Competence in Scientific English*, nouvelle édition, by S. Blattes et al., Grenoble Sciences and EDP Sciences, 2003).

Example: "The Hubble deep field **consists** of 300 images that **were taken** in 1995. It **maps** just one small…Never before **have** so much data **been** available."

4.5 Future

The future is expressed in English with either the present simple or the verb "will" and the base form (infinitive without "to"). When referring to work that follows in the same paper, use the present to describe the immediate and certain future: "We explain our method in Sect. 2."

For future work after this article or for predicted events, use the future form with "will".
"Once these stars have been observed, they will be analyzed with the new method."

N.B. In the subjunctive (conditional) use of "will", neither "will" nor "would" is used after the subordinating conjunction:

✗ "If we will take two nights to observe, we will be able to detect the source."
✓ "If we take two nights to observe, we will be able to detect the source."
✓ "If Galileo **had** not withdrawn his claims, he would have been burned." *or*
✓ "**Had** Galileo not withdrawn…"

4.6 Active vs passive voice

Unlike the active voice, the passive voice emphasizes a process or event leading to results more than the actor, so science writing tends to use the passive, especially when there are large teams of researchers. However, this leads to wordy and often complex sentences and paragraphs when used exclusively, so A&A recommends more use of the active or at least asks for the voice to be varied in all sections of the paper.

Example: "That such observations can lead to accurate results is demonstrated by our analysis" should be written as "Our analysis demonstrates that such observations lead to accurate results."

4.7 Multiword verb phrases

Verbal phrases sometimes cause problems in papers. Some of them require a specific adjective or preposition, or the meaning changes with that additional word (Compare "break down", "break off", and "break out"). See Sect. 8 for several examples of the verb phrases we see most often: "depend on" or "associate with".

Other multiword verbs require that the additional words go after any direct object and are called "separable": "to take something into account".

4.8 Gerunds and infinitives

Gerunds and infinitives are used with different verbs, and when one verb takes either form, then something different may be implied. This is also true for reported speech.

- Verb+direct object+infinitive: "This test allowed us to prove our hypothesis."
- Verb+infinitive: "They decided to retest the method."
- Verb+that+dependent phrase: "Smith et al. argue that…" or "The results suggest that…"
- Verb+ing (gerund or present participle): "They suggested taking more time for the observations." These verbs include "admit", "anticipate", "consider", "finish", "mention", "propose", "recall", "recommend", "remember", "report", "suggest". In this list, only "finish" cannot also be used with a "that" clause.

Example: "We recall seeing it there" or "We recall that we saw it there."

There are other phrases where the gerund or infinitive can be used but with different meanings.

Example: "We stopped doing that" means we ceased doing it, but "We stopped to do that" means you interrupted another action to do it.

5 Nouns, articles, and adjectives.

5.1 Nouns that are either singular or plural depending on their context in the sentence

Number, none: When referring to many individual things, use the plural verb: "A number of stars were found in our last observing run." Here "number of" means "many", which you can also use. If instead you are referring to the number itself, use the singular: "The number of stars exceeds several thousand."
"None of the parameters are constant." insists that not any out of many are constant, whereas using a singular verb emphasizes that not a single one of them is constant, but implies nothing about how many are being considered.

Majority, minority, variety, fraction: As for "number", if you use these words to mean a group of individuals, stars, etc., use the plural verb. A majority implies a number of things over 50 % (so make certain you do not just mean "many" there) and a "minority" to less than 50 %. (Do you mean "a few"?) In standard English, "fraction" implies a small number that is considerably less than 50 %. "Fraction", as well as "variety", also takes a plural verb, although there is no dependence on how many. The LEs will change those uses outside strictly mathematical contexts to "portion", "number", "percentage", etc.

Example: "The majority of scientists hope the agency will increase the number of grants."
"A wide variety of line profiles were found in the observing run."
But "The overwhelming majority still votes for amnesty."

Statistics, systematics: These words are usually plural when they refer to a set of measurements: "The statistics for our sample are found in Table 1."
If you want to make it singular in this meaning, then use "set of statistics". The word "statistic" is for a single one of these measurements, while the study of statistics is also singular, as for "physics" and "mathematics": "Statistics was his specialization at university."

In contrast, "**dynamics**" uses a singular verb, whether referring to the study of dynamics or the properties and forces themselves.

Data: This is the plural of "datum", so A&A considers it a plural noun, as in "The data are ...". Use "a data point" or "a data set" to be more specific.

Citations: In references to papers, the grammatical number of the author's name(s) can be unclear if the full reference is abbreviated ["M2015 discuss" or "M2015 discusses"?]. The verb should be singular or plural according to the number of authors [Maeder and Meynet (2000) show that…; Meynet (2010) shows that…]. The ambiguity can be avoided by referring to the paper itself: "As seen in M2015..."

Other questions about plurals.
Usage that we often need to change includes structures with "one of the X…" and a plural noun used as an adjective (see Sect. 2.2.3), along with the following:

-- The noun following "One of the" must be plural: "One of the best astronomers in the world".

-- When a plural noun is used as an adjective, the plural S is dropped to fit its new function ("galaxy cluster" for "a cluster of galaxies"), with a few exceptions ("least squares method"). Other exceptions are Latin plural nouns ("data bank") and nouns that have no singular form: "a physics book", "a sports car", "newspaper". See Sect. 2.2.2 for hyphenation of these compounds used as adjectives.

✗ "elements enrichment"
✓ "element enrichment"

5.2 Capitalization and abbreviation

5.2.1 Headings

A&A only capitalizes the first word of the title, section headings, and table and figure titles with the exception of accepted proper names (e.g., names of people, copyrighted names, and specific instruments). Abbreviations are to be avoided, unless they are very common ones, such as cardinal directions (NE), some star names, or chemical elements; when possible, please write them out in any heading.

In the subtitle to a title or a section heading, capitalize the first word (regardless of how it is punctuated).

Example "Star formation in Andromeda: A review" or "Star formation. A review"

5.2.2 Location indicators in a paper

The following expressions should always be abbreviated, unless they appear at the beginning of a sentence, and capitalized: Sect. 2, Sects. 2 and 3; Fig. 1, Figs. 1-4; Eq. 1, Eqs. 1 and 2; Col. 1, Cols. 1-3.
"Table" is never abbreviated, although it is capitalized when followed by its designated number. In addition, when any of these words are not followed by a number or letter indication, then they are treated as normal nouns that are not capitalized: "This argument can be found in the next **section**, where **Eqs.** 5 and 6 are discussed".

5.2.3 Names

- Use capital letters (upper case) for adjectives and verbs formed from proper names:
  - ✓ Poissonian, Newtonian, or Comptonized.
- Many SI units are now lower case:
  - ✓ "gauss", "kelvin", or "newton", but "Celsius".
- Use capitals for proper and generic names that are traditionally used for a single, special object:
  - ✓ Local Group, Magellanic Clouds.
- Use for unique instrument names and observatories.
- Use for copyrighted material (not just the name of a method or code).
- Use the lower case for generic names and terms, such as spectral energy distribution or active galactic nucleus, even when introducing the acronym (see below).
- Use lower case for full names of chemical elements and cardinal directions:
  - ✓ lithium, southeast.

5.2.4 Acronyms

Use the lower case for terms when introducing acronyms. All acronyms need to be introduced for all abbreviations except for units of measurement and the cardinal directions (N, SE, etc.). The acronyms of names of instruments or telescopes can also be introduced when appropriate. If an abbreviation is introduced in the abstract, the introduction must be repeated in the main text. The words in the name or term are not capitalized unless it is either (i) a word that is a proper name, as described above, or (ii) an acronym that is formed from other than the first letters:

Examples star formation (SF), Atlantic Ocean (AO), the Galactic center (GC), HIgh-Precision PARallax COllecting Satellite (HIPPARCOS)

5.3 Complex noun phrases

A complex noun phrase has several modifying additions to either the subject or the object of a sentence. [http://grammar.ccc.commnet.edu/grammar/phrases.htm#noun]

5.3.1 Problems with length

Avoid overly long noun phrases for the subject, since they tend to distance the main noun from the main verb, so that a reader may lose the thread of the idea once the main verb turns up. This can happen when related information is added to clarify something in the noun phrase, often not even the main noun itself (see last example).

✗ Several detections involving hot-Jupiter exoplanets have been reported.
✓ Several detections have been reported that involve hot-Jupiter exoplanets.
✓ Several detections of hot-Jupiter exoplanets have been reported.
✗ The addition of a magnetoacoustic sausage plus a kink wave, either magnetoacoustic or Alfven, with slightly different frequencies, gives it all

the required properties.
✓ The required properties are obtained by adding a magnetoacoustic sausage plus a kink wave with slightly different frequencies. The kink wave can be either a magnetoacoustic or an Alfvén wave.

5.3.2 Verbal nouns

A noun phrase formed with a verbal form (infinitive or gerund) can work in a sentence, making the action itself the subject or object in many ways, most of which pose no problem in MSs (see http://en.wikipedia.org/wiki/Verbal_noun):
"Studying stars is our business" or "Our business is to study stars".
This phrasing is handy for avoiding the wordy "The study of stars is our business."

5.3.3 Noun phrases with "that"

A useful noun phrase begins with "that" and includes at least a subject and verb: "That planet-hosting stars are so very far away has made it hard to detect them."

Many authors add "The fact" to introduce this structure, but it is not needed and feels contradictory, as in
✗ "…reflects the fact that such objects can be observed within..." (not a true fact)
✓ "…reflects the possibility that these objects are observed within..." or
✓ "…reflects that these objects can be observed within..."

5.3.4 Articles

As for other sections, this guide cannot explain all the rules and variations for this category, but for authors who find they are often corrected for articles (a, an, the, etc.) and determiners (those, these, such), as well as for the difference between count and noncount nouns, please see:
http://grammar.ccc.commnet.edu/grammar/determiners/determiners.htm or
http://grammar.ccc.commnet.edu/grammar/noncount.htm

5.3.5 Adjectives

Adjectives occasionally pose a problem in A&A papers, but it does show up in the captions, as seen in the examples below. Please see https://learnenglish.britishcouncil.org/en/english-grammar/adjectives/order-adjectives and consider the so-called royal order of adjectives at http://grammar.ccc.commnet.edu/grammar/adjectives.htm: determiner (e.g., article) - observation (opinion) - size - shape - age - color - origin (e.g., nationality) - material - qualifier - noun

Example either "indicated by a dashed red line" or "red dashed line", but be consistent. (It is not clear whether "dashed" is the shape or the material in the "royal order", but the line is both red and dashed.)
"red and gray shaded areas" (There are two or more areas that are red and gray.) or "red- and gray-shaded areas" (The shading is both red and gray.)

6 Structural concerns

The LE is not concerned with the overall structure of the article, except as mentioned in Sect. 1.2. If there are obvious anomalies, however, the LE will mention it to the author or contact the scientific editor for advice.

6.1 Paragraphs

Each paragraph should have its own focus that is introduced in the first sentence. Ideally, this first sentence should also include a brief transition phrase or reference from the preceding paragraph or else a clear connection to the topic of the whole section.

6.1.1 Length

Avoid writing paragraphs that are too long or too short. Paragraphs that are too long can be difficult to read. Similarly, having too many short (two or three sentences) paragraphs in a row leads to monotony and a lack of transition within a section. The best approach for paragraphs is to aim for variety in length following the shifts in topics.
A research paper is expository writing, so each topic needs some development, which means that one-sentence paragraphs are not appropriate, even if split into two short sentences, so the LE will very likely suggest combining it with an adjacent paragraph.

6.1.2 Transition between sentences and sections

The transition between ideas helps the reader follow the discussion without stopping to guess where it is going. This occurs in many different ways: pronoun reference (this, they, etc.), repetition of a key word or phrase ("This repetition confirms the reference to an earlier idea."), use of logical connectors (however, finally, again, all in all, etc.), or parallel structure (Sect. 6.3). (http://grammar.ccc.commnet.edu/grammar/transitions.htm)
If one of these tools is overused (e.g., one per sentence or every two sentences), the reader will notice the devices rather than follow the discussion itself. These include "actually", "in fact", "moreover", "indeed". One example of overuse is when several sentences in a row use indicators of contrast (and argument), which leads to the impression of the author arguing with her/himself. Another is a string of phrases for addition, such that a reader might wonder if a list might not be a better idea.

Likewise, "hence" is often overused in the papers we see. It is useful in the right context, usually before a fragment following what it refers to, not as the first word of a sentence or instead of "therefore" to connect to a new sentence: "He knew he could not win the election, *hence* his decision to withdraw". When overused, it loses its strong rhetorical power, so limit its use to once or twice over several pages rather than once or twice a paragraph.

6.2 Sentences

A sentence should contain one idea with closely related information. Long, run-on sentences can be unclear and difficult to read, so split them into two or three shorter sentences, where possible, although (as mentioned above) only if the original is unwieldy

6.2.1 Beginnings

Avoid beginning a sentence with an abbreviation, and do not begin with a number (unless written out), a formula, or a symbol.

✗ Sect. 3 shows...	✓ Section 3 shows that..., while Sect. 4 presents...
✗ 96 stars...	✓ Ninety-six stars...
✗ α Tauri was detected...	✓ The star α Tauri was detected...
✗ $E = mc^2$ is Einstein's...	✓ Einstein's famous equation is $E = mc^2$

Avoid overusing indirect introductory phrases that are intended to emphasize the idea in the sentence:

- Phrases stating your emphasis (e.g., "It is worth stating that" or "We want to stress that") are wordy thus taking away from the strength of your assertion when used more than once a page. They are, however, better than addressing the reader with "Note that", which is best left off entirely. (At most use "We note that" or one of the choices just above.)

- Phrases stating purpose ("concerning" or "with regard to") because they are usually unnecessary and wordy:

✗ "Concerning the value of the frequency, we investigated whether stars release..."
✓ "We investigated the value of the frequency at which stars release..."

If you begin a sentence with a dependent clause, then make certain that its understood subject is the same as the subject of the sentence that follows (called a dangling modifier, which can be amusing at times).

✗ "Having studied the spectra, the two galaxies were approaching each other."
✓ "Our study of the spectra showed that the two galaxies were approaching each other."

6.2.2 English default structure

The English declarative sentence is based on a structure of subject, predicate (central verb phrase), and objects of the action. The sentence structure can be varied, but should be followed as often as possible. The two problems we see most often follow:

In general, avoid separating the subject from its verb (the main action of the sentence) or inverting the standard word order of subject-verb-object.

✗ The author, after revising the English, submitted his article.
✓ After revising the English, the author submitted his article.

✗ Especially appealing is the study of its stellar winds.
✓ The study of its winds is especially appealing.

Likewise, avoid separating a transitive verb from its direct object. While some adverbs go before the verb[1] (often, rarely, etc.), an adverb generally follows either the object of the verb (transitive verb) or the verb when it is intransitive:

✗ The star's image shows clearly the alignment.
✓ The star's image clearly shows the alignment.
✓ The star's image shows the alignment clearly.
✓ The star's image frequently shows the alignment clearly.

✗ We take into account the new data. (This is a separable verbal phrase.)
✓ We take the new data into account.

The verbs allow, enable, and permit require an object:
✗ This program allows (enables, permits) to analyze the data.
✓ This program allows us to analyze the data.
✓ This program allows the data to be analyzed.
✓ This program allows analysis of the data.

6.3 Parallel structure

Parallel structures, which are those that have the same grammatical structure, make for greater readability and clear reference in a sentence. It is required in lists and can also be used to create transition in paragraphs or full sections (6.1.2 above).

✗ UCAC3 provided a data set that has coverage in proper motion and with reasonable errors. (Using "that has" and then "with" makes the sentence difficult to follow as two possible corrections show.)
✓ UCAC3 provided a data set that offers both coverage in proper motion and sufficient accuracy.
✓ UCAC3 provided a data set that offers coverage in proper motion with reasonable errors.

Place the first word of a compounding structure before the first element of the list, rather than earlier in the sentence.
✗ "using **both** data from the literature and the archives" (Ambiguous: the archives or its data?)

1 Adverbs can move in their sentences, but there are still rules depending on the type of adverb: before the subject, before the verb, or after the verb and its object. [link for more: http://www.ccc.commnet.edu/grammar/adverbs.htm or https://www.englishclub.com/grammar/adverb-position.htm]. "Only" and "also" and adverbs of time and frequency (sometimes, recently, never, rarely) tend to go before the verb when used as adverbs ("We also studied low-mass disks.") or between the verb and its auxiliary ("The satellite has only been in service for a decade."). "Hardly" and "only" tend to precede the word it qualifies, when used as adjectives ("Hardly anyone asked questions.")

✓ "using data from both the literature and the archives"
✗ "LBVs show **not only** photometric variability, but also reveal different spectra."
✓ "LBVs not only show..., but also reveal..."
✗ "...minimizes the scatter between observed and synthetic spectra, both in terms of line equivalent width and overall spectral synthesis around the lines of interest..."
✓ "...scatter between observed and synthetic spectra, in terms of both line..."
(otherwise, it can be referring back to "both observed and synthetic spectra".

7 Clarity and precision

In English, it is a stylistic virtue to be concise and to use the precise phrasing for an idea, and in science, precision and clarity are necessary. In this sense, the demands of style and science coincide. In scientific writing, many wordy constructions can be tolerated until too many of them combine to cloud the meaning. Likewise, poetic language and puns that work well in other contexts should be avoided in scientific articles as much as possible, especially when some readers may not be able to appreciate them. On the other hand, some metaphors have legitimately entered into the terms of some specialties, and other expressions are so common that they have become clear to close colleagues, but not necessarily to the whole community. The LEs keep these factors in mind as they edit.

7.1 Conciseness

Take a look at the discussions and lists on several websites (e.g., Capital Community College's Guide to Grammar and Writing (http://grammar.ccc.commnet.edu/grammar/concise.htm) and in all style manuals in English (e.g., Strunk & White, http://www.bartleby.com/141/strunk5.html#13) for confirmation of the principle and for abundant examples in the common language, but the following are typical of the language we see in A&A papers.

7.1.1 Avoid redundancy

When one word repeats the same idea as the other, then it is not needed, even for emphasis. See Sect. 8 (Frequent changes) for other examples.

✗ decreases down	✓ decreases	✗ close proximity	✓ proximity
✗ on the order of a few	✓ a few	✗ circle around (orbit)	✓circle (orbit)
✗ the point of onset of	✓ the onset of	✗ is of fundamental importance	✓is important; is fundamental
✗ the obtained results	✓ the results	✗ coupled together	✓coupled
✗ such as, e.g.,	✓such as OR for example	✗ effect due to	✓ effect of
✗ the existence of OR the presence of when the noun after it implies that meaning (see below).			

7.1.2 Avoid wordy constructions

As in:

The data reduction was performed	The data were reduced
has a tendency to	tends to
at the present time	now, nowadays, currently
in spite of the fact that	although; even though
due to the fact that	because
in the case of X	for X; about X
detect the presence of an atmosphere	to detect an atmosphere
perform an identification	to identify
Concerning the explosion, its effect is…	The effect of the explosion is…
The intersection of X and Y occurs	X intersects Y
We aim at estimating	We estimate
make a comparison with	to compare
shows strong indications of X	indicates X strongly
is in contradiction with	contradicts
is in agreement with	agrees with
Before proceeding further, it is worth commenting at this point that we have studied the…	We have studied the…

7.1.3 Aim for direct and active phrasing.

Avoid the **double negative** in favor of a direct, affirmative statement, because not indicating the precise degree is ambiguous and the double negative only tells what it is not: e.g., "This result is not unlikely" can be either "This result is possible" or "This result is likely".

Use **indirect introductory phrasing** only when direct phrasing may not be possible, as in "It has been suggested that…". See Sect. 6. 2.1. for examples of when this becomes a problem.

Whenever possible, use the **active verb form** rather than the equivalent noun phrase, which is wordy and which is already required so often in science writing that using more than is required means that the style quickly becomes too convoluted.

✗ "the estimation of x is"
✓ "estimating x is"
✗ "We observe the planet by the detection of the stellar light it reflects"
✓ "We observe the planet by detecting the stellar light it reflects"

✓ or, better, “We detect the planet by the stellar light it reflects.”

7.2 Ambiguity

Ambiguity often occurs when there is an error or awkwardness in the phrasing so that the LE cannot be certain of what was intended by the author. At this point, the LE suggests a rephrasing, which should then be checked by the author. If the suggestion does not express the intended meaning, then the original needs to be rephrased and checked with the LE (highlight text) or a note sent to the LE with the file explaining more about what was intended, so a new phrasing can be found.

7.2.1 Avoid unclear or imprecise phrases.

Ambiguity often comes from words that have more than one meaning or use, particularly for connecting words that are also used as adverbs, prepositions, and adjectives. One example is “and”, which is overused in English for a more precise connector, whether “then”, “because”, “whereas”, or others. “And” is fine, of course, when addition is the intended connection. See Sect. 8 for more examples of possibly ambiguous words.

Like	Do you mean “such as” or “similar to”?
As	“while” or “at the same time as” or do you mean “because”? Or is it part of the comparison “the same as”, along with many other uses?
As for	“in the same way as for X” or “regarding” or “concerning”?
Since	“because” or “after which”?
While	“whereas” or “during”?
So	“therefore”, “meanwhile”, or “because”?
Quite	“very” or “somewhat”?
Rather	“instead”, “very”, or “somewhat”?
Further	“farther”, “more”, “another”, “again”, “furthermore”, or “an extended”?
Such	“this sort of”, “very much”, “these”, etc.?
Issue	“problem”, “concern”, “question”, “complication”, “frustration”, or “journal publication”? (This is overused in common speech for many other things than its main use: an important and complex problem or difficulty for debate.)
Fraction	a ratio (fraction), “percentage”, “portion”, “amount”, “number”, or other? (In standard English “fraction” implies small or low, so either give the exact value or one of the alternatives if the fraction is greater than about 10-30%. The exact measurement is always better, of course, but definitely avoid “composed of a large fraction (99%) of non-star-forming gas”.)

Imprecise phrasing also occurs when using words that are very close in meaning or in sound:

relative to/ compared to/ with respect to
affect/ effect/ impact
in contrast to/ contrary to/ opposed to/ compared to
due to/ owing to/ thanks to (The first tends to be used as an adjective, the others as adverbs.)
than/ then
insure/ assure/ ensure
comprise/ consist of/ be composed of/ include

"Comprise" refers to a whole, which includes the parts that are the object of the verb. What follows the active form of "comprise" must be a complete list of the parts that make up the whole, otherwise use "include", which signals that the list is of examples, not necessarily of the whole set (so using it with ``e.g." is redundant).

7.2.2 Use the exact measurement.

If not using an actual figure, then at least use the precise adjective for a measurement. English uses adjectives like high/low and greater/less more than other languages, where the equivalents of large/small predominate. Use the following chart of descriptive words in scientific papers to find the standard adjective for the noun for a measurement.

high or low	abundance, absorption, accuracy, adiabaticity, background, brightness, contrast, degree, density, energy, extinction, fraction, frequency, latitude, level, luminosity, mass, metallicity, number, obliquity, percentage, precision, pressure, probability, proportion, quality, rate, redshift, resolution, shear, speed (fast, slow), temperature, value, velocity (All are typically indicated by up/down graphs.)
big/large or small	amplitude, broadening, diffusivity, momentum, opacity, proper motions, radius, uncertainties
high/low or large/small	dispersion, frequency, magnitude, number (also, value in some mathematical contexts, but not all, which LEs cannot judge), number statistics (=reference to the sample size)
wide/broad or narrow	range, spread, variety
steep or shallow	gradient, slope
long or short	burst, length, period, time, timescale
strong or weak	acceleration, anisotropy, argument, asymmetry, constraint, contrast, current, dependence, effect, evidence, magnetic field, flow, gradient, instability, pulse, relevance, shear, turbulence, velocity field
tight or loose	relationship, constraint, correlation (often same as strong/weak)

Avoid **vague qualitative descriptions**, such as "rather small" or "very important", but especially avoid them when you could give the exact measurement rather than just imply a degree of size or importance. Other examples include:

- "partly true" or "somewhat consistent" (Both are ambiguous, since the adjectives imply an absolute quality.)
- "the fact that" (Often a fact is not what follows, and usually it is just wordy. See Sect. 7.1.2.)
- "in any case" and other fillers that mean little. (Can it be replaced by "in all cases" or "in either case"?

7.2.3 Check for reference confusion.

Make certain you can define what a pronoun (e.g., it, this, they, one) or reference word (e.g., "the latter" can only refer to a choice between two possibilities) refers to, and then consider whether the reader will see the connection immediately with no other possibilities.

Look again at the subject of a subordinate phrase to make certain it is the same as the noun in the sentence it is related to (see the end of Sect. 6.2.1. on dangling participle phrases).

✗ "Considering only up to the quadrupole interaction and neglecting the o-diagonal interactions, the energy shift for the total angular momentum F = I + J due to the hyperfine interaction is given by Schwartz (1955):…" (The energy shift neither considers the interaction nor neglects the interactions, the author (here, Schwartz) does so, but they are not the subject of this sentence.)

✓ "By considering...., we..." *or* ✓ "When we considered the..., the energy shift..." *or*

✓ "Schwartz (1955) gives the energy shift…, considering…"

(There are other possibilities, e.g., two sentences.)

In the same vein, you need to make certain that the subject of a subordinating logical connector is clear -- "as well as", "in addition to", and gerunds that can refer to any of the preceding nouns or verbs -- and make certain that any list that follows them is parallel in construction (Sect. 6.3).

✗ "Emission from gas clouds at lower densities progressively increases in addition to the emission from the dense clouds."

✓ "Emission from....increases, as does the emission from..."

✓ "Emission both from gas clouds at...and from the dense clouds progressively increases."

✗ "In this paper we present fluxes in the CI lines of neutral carbon at the centers of some 76 galaxies with far-infrared luminosities ranging from X to Y, as obtained with the *Herschel Space Observatory* and ground-based facilities, along with the line fluxes of the J=7-6, J=4-3, J=2-1 CO, and J=2-1 ^{13}CO transitions."

(What follows "along with" refers grammatically to what follows "as obtained", but it makes more sense to be equal to "far-infrared luminosities". The problem is that "with" introduces both phrases, and therefore one of them needs to be changed: "...X to Y obtained from the..."? See Sects. 6.1.2 and 6.3.)

8 Frequent changes

This section deals with single words and phrases that we see and often have to correct in the ways listed and for the reasons given in the last column. It is to be used with your MS while you work

before or after it has been language-edited in conjunction with the more detailed explanations in the rest of this guide.

Keyword	phrase needing correction	alternative or corrected phrase	explanation and alternatives
account	to take into account X	to take X into account; to consider	A separable multiword phrase. See Sect. 4.7 of Guide.
actual	the actual situation	the present situation; current	False cognate from some languages; see dictionary.
agreement	to be in agreement with	to agree with	Wordy and overused, yet useful in a few specific contexts.
aim	(not incorrect, but sometimes awkward)	We aim to do; aim at doing	Or if in the abstract, simply use "We.." and the verb.
albeit	Albeit it has higher S/N,	Although it has higher S/N; albeit with higher S/N	Albeit means "although it be", so it cannot be used with another verb.
allow	to allow to do X	to allow us to do X; to allow X to be done; to allow Xing, etc.	This is a transitive verb that requires a direct object (X), but there are other choices for saying the same thing. Sect. 6.2.2.
as	"as" in the sense of "because"	Use "because of" or "since": "because of" is better, "since" is sometimes ambiguous.	Overused: "as" is used for too many other purposes where there's no other word, so that it should be avoided for causal relations. See Sect. 7.2.2.
as	stars as X and Y…; as, e.g.,	stars, such as X and Y…	The phrasing is with "such", not alone, and it subordinates the list that follows.
as	both X as well as Y	both X and Y; X and Y; X, as well as Y	"As well as" cannot be substituted for "and".
associate	associate to	associate with	Use the correct preposition.
bad	a bad result	a poor result; an incorrect result	"Bad" implies a moral level, unlike the 2 other choices.
be of	be of high accuracy; be of importance; be of X origin	be very accurate; be important; have an X origin	A wordy phrasing that should be used sparingly and does not add any new meaning over the standard phrases.
best	the best value	the most precise value	Implies a moral level, as for "bad" above.
besides	Besides, …	Besides that; Along with that; In addition	"Besides" alone means something slightly different at the beginning of the sentence, an argumentative point, not just addition or contrast.
both	both X as well as Y	both X and Y	"both…and…" is a defined phrase, and it only allows 2 items.
can't	can't; can not; other contractions	cannot; will not; have not; etc.	A&A follows the policy of formality related to contractions.
candidate	candidate to do	candidate for doing; a candidate for N	General usage for this.
case	in case of	in the case of; whenever; for	"The" is often left off, so it means "whenever" instead.

center	center around	center on; situated around/at	The correct preposition is “on”; “at” may sometimes work with measurements in an instrumental position, e.g., “ centered at l = 136º, b = 7º ”.
claim	X is claimed to be Y	It is said/claimed to be Y; Z claim that X is Y	See “suggest” below.
combine	combined together	combine	Redundant.
comparable	comparable with	comparable to; similar to; compared with	“To” is the preposition used with the adjective form.
compared	compared to (or with)	more than, less than, etc.	Overused so needs checking whether the standard comparison is meant. See “with respect to”.
composed	composed by	composed of	Incorrect preposition, except in music.
comprise	to comprise of X	include X; comprise X; constitute X; be comprised of X; consist of	Incorrect preposition, but perhaps not what is meant: see Sect. 7.2.2.
concentrate	only concentrate on	concentrate on	Adding “only” makes it redundant.
confront	to confront X with Y	to compare X with (and) Y	False cognate in this context; see English dictionary.
consideration	take into consideration X	to take X into consideration	A separable multiword phrase. See Sect. 4.7 of Guide.
contradict	contradict X with Y	X contradicts Y; compare X and Y	Choose one.
contrary	contrary to	in contrast to; instead,	Overuse or misuse. Definition for English use:
correct	correct from	correct for	Not the standard preposition when only one object. OK with “corrected X from Y version to Z version”.
correlate	correlate to	correlate with	Wrong preposition.
correspond	correspond with	correspond to	Wrong preposition.
data	used 2 data	used two datapoints	The singular of “data” is “data point” or “datapoint”.
decrease	decrease down; decrease of	decrease; decrease in	Redundant (V); preferred preposition (N).
depend	to depend of; depend with; dependent of	to depend on; be dependent on	The preposition is ON for these.
detail	to detail X	to explain X in detail	OK if is truly detailed, such as a list of parameter values in a table, but not for a section that explains.
details	in details	in detail	A standard phrase without plural.
discriminate	discriminate	distinguish; differentiate	See the dictionary for the differences. One legitimate use is in a phrase like “ to discriminate spurious features from true absorption bands” because of the quality of what needs to be distinguished.
discuss	discuss on/about X	discuss X	This is a transitive verb so there is no preposition, just the object: what is being discussed.

discussion	discussion on	discussion of/about	This is the correct preposition, although the first is understandable: a discussion on the topic of = a discussion of (see "study").
dominate	dominate over	dominate	Redundant with preposition.
done	a study of X was done	X was studied	Wordy and redundant.
due to	an effect due to X (or another combination)	an effect of X	Redundant phrasing, since both are causes.
Due to	Due to X, something happens…	Owing to X, …; Because of X,…"; "X causes…", "as a result of", etc.	Overuse of "due to" is one problem in general, but its default use is adjectival, not adverbial, as in this example, unlike "owing to" and others, so it can be ambiguous in some sentences.
effect	effect due to	effect of	Redundant.
e.g.	when used in main text	for example; for instance; such as; list after a colon with "etc." or "among others"	Avoid abbreviating in the regular formal prose, but OK in parenthesis & captions.
enable	to enable to do	to enable us to do	See "allow"; transitive verb requires a direct object.
enhance	enhance the X	to increase the X	Enhance is fine in the right context, but it does not mean "increase". See dictionary.
etc.	e.g., A, B, C, etc.	e.g., A, B, and C. Or A, B, C, etc.	Each implies that the list is not exhaustive, as does "such as", so together they are redundant.
every	every X	every X, or each X	Almost the same meaning, but a different emphasis: each emphasizes "one by one" and every emphasizes the sense of "all".
evidence	evidenced by; evidence for; evidences	shown by, illustrated by, proven by; evidence of; pieces of evidence OR proofs	Overused for the choices given, so ambiguous; same comment for the preposition. The noun is not countable, so there is no plural. OF is the standard, while FOR has a specific use in English, as in "evidence for the prosecution".
existence	detect the existence of X	detect X	See Sect. 7.1.1.
fact	the fact that… possibility…; the fact that…can be…	the possiblity that… is	Avoid "fact that" if it does not refer to an actual fact. The trick is to find the word or idea in what follows to find what can replace "fact" (e.g., possibility, see 5.3.3.).
fact	due to the fact that…	because	Wordy; see Sect. 5.3.3.
few	few X	a few X; very few X	Leaving the article off changes the meaning.
fit	fit by a Gaussian	fit with a Gaussian	US spelling: UK=fitted.
focus	focus only on	focus on	Adding "only" makes it redundant.
following	in a/the following X	in the next X; in a subsequent X; in the following way	It is correct but overused in too many functions, so if the others are seldom used or not at all, then it should be varied when used often.

fraction	a large fraction; a significant fraction	a high percentage, large portion, amount, number	Overused for the choices given: See Sect. 7.2.2. The word alone implies "small", not large.
frame	in the frame of X	in the framework of X	This is the word in this context.
further	— adds a further X; went further — Further, we…	— adds another X or adds more Xs; went farther; — Furthermore, we…	Overused word with many meanings leads to ambiguity Sect. 7.2.2. Farther = distance; further is figurative distance or depth: discussed the problem further. "Furthermore" is the word for the logical connector that is meant.
global	Globally,	In general,	This is a semi-false cognate, which is true for other uses in a sentence: check you do not mean "overall" or "generally".
happen	X happened	S occurred	"Happens" suggests chance, but an observed event is definite.
hence	Hence, we….	As a result; We therefore…; thus	overuse and some misuse.
i.e.	when used in main text	that is to say; meaning that; which means that; that is; in other words	Avoid abbreviating in the regular formal prose, but OK in parenthesis & captions.
ignore	ignore X	neglect; omit; exclude	False cognate in some contexts (see English dictionary), but appropriate in others: "ignorable coordinates".
impact	to impact (on)	to affect; to have an impact (or effect) on	Even "to impact something" is questionable, unless it is to land on it strongly:"The jets impact on the parent cloud"
important	An important amount	A large amount	False cognate. See dictionary.
impossibility	impossibility to do X	impossibility of doing X; it is impossible to do X	see "possibility" below.
increase	increase of X	increase in X (what increases); same for decrease	The standard preposition for this case is IN, while OF is used for other situations: increase in luminosity; a luminosity increase of 5 L.
independent	independent on (or from)	independent of	The preposition is OF; compare with "depend".
indication	indication for	indication of	The preposition is OF.
influence	influence for (to)	influence on; have an influence on	On goes with "influence" whether noun or verb.
infra	infra-red; infra-structure	infrared; infrastructure	In both US & UK spellings (Cambridge);
issue	issue	problem, question, concern	overused and misused.
large	large intensity (etc.); a large list	high; a long list; etc.	See Sect. 7.2.3 "Large" is not used in English as much as in other languages: "high" is used more often along with other choices.

latter	the latter two; this latter	the last two; the latter	Can only refer back to two items, not more, and should not be used with another demonstrative pronoun.
last	in the last years	in recent years; in past years; in the last decade of the last century (20th).	"recent" is what is meant, but "past" is fine since it also refers to the same time period; however, "last" should be reserved for the end of an earlier period that ended before now.
like	like, for instance,…	such as, similar to, the same as	See Sect. 7.
likely	is likely X	is very likely X; likely to be X; probably X; most likely X	Likely alone is overused for "probably", and fits better in the phrases listed.
made	made up from	made up of	Wrong preposition.
mark	regions are marked A to E	regions are labeled	Imprecise and overused. Choose label, indicate, show, denoted, etc.
match	X matches with Y	X matches Y	Redundant; match X with Y is fine, however.
method	method to X	method of Xing	Infinitive is not wrong, but the gerund noun is the standard.
motivate	the analysis motivates the conclusion	leads to OR justifies	TO MOTIVATE means to cause someone to want to do something or to do it well.
neglect	to neglect something	ignored sthg; neglected to do sthg; did not consider; disregarded	See dictionary.
number	a number of (e.g., in a number of cases)	several; in many cases	Overused, so make certain you cannot use one of these by reserving this phrase for more technical contexts.
null	null correlation; the result is null	null hypothesis or similar rephrasing; the result is zero (or nil or nought)	NULL can be legitimate in some contexts but not in others where it is used more as a false cognate for 0. OK = null hypothesis, null point.
obtain	We obtain that x=2y	We find that x=2y; We obtain x=2y	Mixing 2 structures.
On	On the…	The…	Use only for short, limited papers or for very long treatises, but not for normal papers or section headings.
on	on the panel/figure/corner/etc.	in the panel/figure/corner/etc.	IN is used for what is in the depiction and ON for what is above the paper or film: a fly on the image.
one	one of the X	one of the Xs	The plural is required in this structure.
orbit	orbit around	orbit; move around	Redundant.
order	in order to do X	to do X	Wordy and overused. Only a few contexts might need "in order" to distinguish a prepositional from the infinitive.

order	on the order of a few; of the order of ~X	of a few; close to X; on the order of N; comparable to;	This multi-word phrase means "approximately", so avoid redundancy and use with a single measurement (N), not an object that has been measured (X).
originate	originate from	originate in; come/stem from	Overused & often incorrect for context. Consider "triggered by".
paper	In this paper, we	We… OR This paper…	The 2 together are redundant, not to mention wordy.
penetrate	penetrate in/into	penetrate	Redundant with preposition.
percent	a few percent	a few percentage points	Informal shorthand for "percentage points".
perform	X calibration was performed	X was calibrated	Wordy and redundant.
permit	to permit to do	to permit us to do	See "allow" and Sect. 6.2.3: transitive.
plotted	plotted by a line	plotted as a line	Or ``plot a line''?
possibility	possibility to do	possibility of doing; it is possible to do	This is the structure in English.
preferentially	is preferentially found	usually, preferably, mostly	Defined as giving an advantage to a particular person or group, so not the context for astronomy.
presence	detect the presence of X	detect X	See Sect. 7.1.
priori	assume a priori	assume	Redundant.
quite	to be quite + adjective; to be a quite adj	to be + adj OR to be very + adj; to be quite a + adj;	Used for emphasis, but the word has too many uses so is ambiguous, ambiguous in UK & US, as is "rather".
rather	to be rather + adj	adjective alone or use "somewhat" or a synonym	Indicates a partial quality, but this word is used for other things, too, and in different ways in US & UK English, so is ambiguous. Sect. 7.2.2.
rather	X, rather Y	X rather than Y; X instead (of)	more a UK use for "instead, …."
reference	to reference	to refer to; to supply references; to list	The verb use is not in Cambridge or Webster's.
regular	unregular	irregular; unregulated	IR is the standard prefix for one, UN for the other.
relative to	X is low relative to Y	X is lower than Y	Means "in connection to", not used for normal comparison, only measured or stated **relative to** some other substance or measurement. See "respect to" for more explanation.
remainder	in the remainder of the paper	in the rest of the paper	The second is the normal, hence more natural, way to say it. See dictionary.

respect to	X is large with respect to Y	X is larger than	As for “relative to”, we first check for overuse and for cases where the standard comparisons apply instead. A correct use is “significantly misaligned with respect to the position angle of the disk”.
respectively	X and Y have A and B, respectively	X have A and Y B	This is an overused structure, meant to save words or to be clearer, but it is often wordier and no clearer; it comes across more as jargon because overused.
result	is the result of an X effect	the result of X; is an X effect	Redundant phrasing, as is “due to the effect of X”.
scale	over scale/with scale	on scale; at scale; to scale	The correct preposition depends on the context, but ON is the one most often needed for A&A papers, sometimes AT for extreme and more general references to "scale".
same	the same than/that	the same as	A given comparative structure.
short	shortly	briefly, in a short while	“Shortly" means something else.
similar	similar…as…	similar…to…	A defined comparative structure.
since	since a year	for a year; a year ago	The 1st is duration, so the most likely correction (with the perfect); the second refers to a time in the past when an event occurred (with simple past).
since	Since…,…	“because” or “after which”?	This can be ambiguous in some sentences, though less so than “as”. Sect. 7.2.2.
small	small mass	low mass	See Sect. 7.2.3 and “large” above.
small	a small time/talk	a short time/talk/etc.	Not the precise adjective for the context (See “large’).
so	So,...	therefore; Meanwhile,	This is a coordinating conjunction, so should connect two full sentences, not begin a sentence in formal writing, unlike how it is used in informal writing and speech.
sort	this sort of Xs	these sorts of Xs; this sort of X	Agreement: see “type” below.
stars	the stars X	the star’s X; the stars’ X; the stellar X	No noun used as an adjective uses the plural S, and the adjective of the generic “star” is “stellar”.
statistic	small/large statistic(s)	low statistics, small sample, small number statistics	It seems to be short for “small/large statistical sample” but is too jargony & too compacted. Use plural only.
study	a study on	a study of	This is the correct preposition (see “discussion” above.
sub-	sub-sample; sub-structure; subzero; submm	subsample; substructure; sub-zero; sub-mm but submillimeter	In both US & UK spellings (Cambridge).

such	such X	this X OR this sort of X; these Xs	Overused & too often not in its main meaning: for emphasis to mean "of that or a similar type", not to replace "this" or "these". Sect. 7.2.2.
suggest	suggested to do; suggest X to be	suggested doing; suggest that X is…; It was suggested that…	"Suggest" is an exception in not accepting the infinitive as its object.
suited	suited for	suited to doing; suitable for	A given expression.
sum	sum up	add up; sum	Mixed expressions or redundant.
supposed	supposed to orbit	assumed to orbit	False cognate use of this verb (see definitions in a dictionary: claimed, required).
tension	in tension with	in contrast to, in conflict with, contrasts with,	A false cognate with another language? Or perhaps jargon from a specific branch of physics.
test	a test to	a test of	A given structure.
that	with better X than that reported…	with better X than reported…	Or if a reference is really needed, prefer "those", "the one", or "what", along with other solutions.
together	X together with Y	X and Y; X with Y…; X, together with Y,…; X, along with Y,…	Overused and it subordinates what follows, unlike "with". It is overused instead of more standard forms.
together	combined together with	combined with	Redundant.
tool	a tool to determine	tool for determining	A given structure.
trend	trend for X to have	tendency for X to have; trend toward X having	Choose from the list.
turn	It turns out that	It leads to; It results in	"It turns out" is fine, except that it implies a certain sense of surprise at the outcome, so use it only if that is your intent.
type	this type of Xs	this type of X; these types of Xs	This is true for "sort" and "kind", too.
typical	typical for	typical of	"Of" is the correct preposition in English.
ultra	ultra-violet; ultra-sound	ultraviolet; ultrasound;	In US & UK (Cambridge) dictionaries.
usage	advice on the usage of the X software	on the use of the X software	"Usage" refers to the more general pattern of use, and "use" to the more specific instance.
useful	useful to determine	useful for determining	Not the same meaning, and the latter is the more frequent use in A&A papers.
variation	variation of X	variation in X (quantity that varies); a variation of this procedure (alternative way to do it)	Similar to "increase" and "change": OF is used for other situations, as in "there are several variations of X" (~variants), but what varies is not the object but some property (or several in this case).
well	well observed; well explained	observed fully, observed well; explained fully/clearly	The standard placement of "well" is after the verb, not before, except in some standard phrases. It tends to be vague and even ambiguous, especially when overused.

well	as well as	see “as” above	Overused; don’t you mean “and” in a specific instance?
whether	whether or not	whether	Redundant, since “or not” is understood.
while	We show X, while we show Y	We show X and Y; We show X, although we also show Y	Among other things, “while” is used for contrast, not addition, so do not use for “and” even if for variety in style.
yet	a yet undetected X	an as yet undetected; a still undetected X	The second is the more natural phrasing, but “as yet” is the synonym of “still”, not of “yet” alone.
yield	yield a result	give a result, illustrate, etc.	Overused for other more precise words in the context.