

Writing and Publishing a Research Article

From a blank Overleaf project to a citable Version of Record

The anatomy of an article section by section; $\LaTeX$ and Overleaf; how the same result fits four very different molds; and the concrete steps — submission forms, disclosures, peer review, and proofs — between a manuscript and a published paper.

The document itself, not just the machinery around it

Chapter 8 examined the machinery that decides which research gets funded, how misconduct is investigated, and how peer review and open-science norms judge a result once it exists. This chapter turns to the artefact through which a result actually enters the scientific record: the research article itself, section by section, the tools used to typeset it, the very different molds the same science must fit, and the steps that turn a finished manuscript into a published, citable paper.

1

Anatomy of an article

Title through supplementary material — front matter, body, and back matter, section by section.

2

$\LaTeX$ & Overleaf

Why physics writes in $\LaTeX$, how Overleaf makes it collaborative, and the template that matches your target journal.

3

One science, many molds

Why the same result reads as 4 pages in PRL and several thousand words in Nature or Science.

4

Submission to proofs

Cover letters, submission systems, disclosures, peer review, decisions — and the proofs stage that ends it.

The same categories a good referee checks for are exactly the categories this chapter walks through as things to produce.

CHAPTER 9 · WRITING AND PUBLISHING A RESEARCH ARTICLE

Front Matter: Title, Authors, and Abstract

The part of the paper almost every reader actually sees — and the only part most of them will ever read.

9.1 • THE FIRST THING ANYONE READS

A title that is found, and an author list that is fair

- T** **The title** specific enough to be found by the right search terms, honest enough not to overclaim — “Evidence for” and “Observation of” are not interchangeable — and short enough to read as one clause.
- A** **Authors and affiliations** order conventions differ by field: first/last-author conventions in biomedicine, often alphabetical in large physics collaborations. Each author links to numbered affiliations and, increasingly, a persistent ORCID iD.
- ?** **Who actually qualifies as an author** the ICMJE criteria tie authorship to four joint conditions: a substantial contribution, drafting or critically revising the text, final approval, and accountability for the work — the same standard behind Chapter 8's honorary-authorship discussion.

The corresponding author, and the abstract's two dialects

The corresponding author

Marked with an envelope symbol or asterisk. Handles the submission portal, coordinates the response to referees, and — under a tight deadline — receives and returns the proofs (§9.7). Not necessarily the person who did the most work, but the one formally accountable for the final version.

Two abstract conventions

Unstructured: a single free-flowing paragraph, often startlingly short (PRL).

Structured: explicit sub-headings — Background, Methods, Results, Conclusions — common in biomedical and some general-audience journals. Nature: ≈150–200 unstructured words stating question, result, and significance in that order.

What an abstract is actually for

A database such as Web of Science, Scopus, or Google Scholar indexes and displays the abstract itself — its wording, not just its content, decides how the paper is found. It is normally written last, once the paper's real findings and framing are settled.

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The Body: Introduction, Methods, Results, Discussion

The same four moves this course's referee exercise asked students to check for — now seen from the writer's side.

Introduction and Methods

- 1 **Introduction — a funnel** broad question → what is already known and what gap remains → an explicit statement of this paper's contribution (“Here we show...”). Citing prior work specifically, not as a block citation, is the first thing an expert referee checks.
- 2 **Methods — written so someone else can repeat it** past tense, describing what was actually done: how many trials, what was varied, what was left uncontrolled. High-profile journals often split a short main-text version from a longer online-only version to fit the length limit (\$9.5).

Results and Discussion/Conclusion

- 3 **Results — figures and tables carry the argument** each with a caption a reader could understand alone. Reporting uncertainty — error bars, confidence intervals, sample sizes — is the standard this course's referee exercise asked students to check for, not an optional refinement.
- 4 **Discussion / Conclusion** results read against the introduction's question and the literature; limitations — small sample, an uncontrolled variable, instrument precision — stated explicitly. Some journals split the two sections; PRL merges them into a closing paragraph.

The mirror of the referee exercise

A conclusion that claims more certainty than the results support is exactly the flaw — alongside missing uncertainty and unjustified significance — that paper\1 and paper\2 planted for students to catch. This chapter asks the same question from the other side of the page.

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Back Matter: Acknowledgments, Contributions, References, Supplementary Material

The parts that come after the science — and that a referee, and a reader, still check closely.

Acknowledgments and Author Contributions

Acknowledgments

Funding sources, usually with the specific grant number — funders track this to demonstrate their own impact. Help that falls short of authorship: a colleague who read a draft, a technician who ran one measurement. Large facilities (synchrotrons, neutron sources, supercomputing centres) often require a proposal-number citation as a condition of access.

Author contributions

Built directly on the CRediT taxonomy (Chapter 8): “A.B. and C.D. designed the study; A.B. performed the experiment; C.D. and A.B. analysed the data; A.B. wrote the manuscript with input from all authors.” The same statement students write, honestly, for their own L^AT_EX article assignment.

References and Supplementary Material

- R** **References** style is journal-specific: bracketed numbers in order of appearance (APS, IOP), superscript numbers (Nature), or author–year “Harvard” style. BibTeX/biblatex or tools like Zotero make switching a one-line change — and attach a DOI to each entry.
- S** **Supplementary material** additional figures, derivations, and control experiments that support the paper without fitting the length limit — distinct from a genuinely deposited dataset or code repository (Zenodo, HAL, Software Heritage) carrying its own persistent identifier, as Chapter 8's FAIR-data discussion described.

Why bibliography accuracy matters

This course's referee exercise built several of its planted errors around exactly this: a falsified volume number, a reference in the wrong journal, a citation to an entry that does not exist — common mistakes, and easy for a careful reader to catch.

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Writing in ℓ ATEX: Overleaf and Journal Templates

Content and typesetting handled separately — so a long, heavily revised, equation-heavy document stays consistent.

A typesetting system built for equations, cross-references, and revision

$\LaTeX$

Built on Donald Knuth's $\TeX$ engine. Equations, citations, and figure numbers are handled programmatically — a label written once resolves everywhere it is used — which keeps a long, mathematical, frequently revised document internally consistent. Biomedical and social-science fields still submit predominantly in Word.

Overleaf

A browser-based, real-time collaborative $\LaTeX$ editor: shared compilation, full revision history, inline comments — replacing the older workflow of emailing .tex files and merging edits by hand. Many universities, including some in France, provide free upgraded institutional accounts — worth checking before paying.

9.4 • ONE CLASS FILE PER PUBLISHER FAMILY

The journal template does the reformatting for you

revtex4-2

American Physical Society. Required for PRL and the whole Physical Review family.

iopart

IOP Publishing — the Journal of Physics series. EPL uses its own related epl2 class.

elsarticle

Elsevier's general-purpose class, spanning a large share of that publisher's journals.

aastex

American Astronomical Society — The Astrophysical Journal, The Astronomical Journal.

IEEEtran

IEEE journals and conference proceedings — common in applied and engineering physics.

Nature: the partial exception

Initial submission is deliberately flexible — most manuscripts arrive as Word, and $\LaTeX$ is accepted too, with the journal's own production team handling final formatting after acceptance. At initial submission almost everywhere, editors read for the science, not the typesetting.

9.4 · CHECK THE CURRENT PAGE, NOT A MEMORISED LIST

Templates and accepted formats change as publishers update production

Historiographical note

ℒATEX support, required templates, and even which submission formats a journal accepts change from time to time as publishers update their production systems. The authoritative source is always the specific journal's current “Instructions for Authors” page — usually linked directly from its Overleaf template, when one exists — not a fixed list memorised once and never rechecked.

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One Science, Many Molds: Comparing Journal Formats

The same result, written up as a four-page Letter or a several-thousand-word Article, is not a cosmetic choice.

9.5 • FIVE VENUES, FIVE VERY DIFFERENT MOLDS

Illustrative, approximate — always check current guidelines

Journal / type	Main-text length	Abstract	Figures/tables	References
Phys. Rev. Lett. (Letter)	≈4 pages (≈ 3000–3750 word-equiv.)	≤600 characters	no fixed cap (typ. 3–4)	no fixed cap
Phys. Rev. B/D etc. (regular)	no fixed cap	unstructured	no fixed cap	no fixed cap
Nature (Article)	≈2500–4300 words	≈150–200 words	typically 4–6	up to ≈50
Science (Report)	≈2500 words	≤125 words	≈4	≈30
Science (Research Article)	≈4500 words	≤125 words	≈6	≈40–70

Numbers are drawn from each journal's own current author guidelines and change periodically — verify before submitting.

Compression for a broad reader, completeness in a companion paper



The most selective venues compress deliberately PRL, Nature, and Science impose tight caps less to save printed pages — most content is now read online — than to force a framing legible to readers outside the immediate sub-field, pushing full technical detail into Methods, Supplementary Material, or a companion paper.



The Letter – companion paper pairing a short, high-visibility Letter announcing a result, alongside or shortly after a longer companion article (a Physical Review B or D regular article) giving the full derivation and every control measurement the Letter's limit could not fit.

Not the same as salami-slicing

A Letter–companion pair reports one result once, at two levels of detail, each paper stating the other exists — unlike dividing one dataset into the minimum publishable units (Chapter 8, §8.3) purely to inflate a publication count.

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Submitting a Manuscript: Cover Letters, Systems, and Disclosures

A finished manuscript is only half of what a submission portal actually asks for.

Cover letters and submission systems

- L** **The cover letter** addressed to the handling editor: why the result matters and fits the journal, confirmation the manuscript is not under review elsewhere, and sometimes suggested or excluded referees. Most physics journals now explicitly welcome preprinted (arXiv) submissions.
- S** **Submission systems** Editorial Manager (Aries Systems — Elsevier, Springer, many societies), ScholarOne Manuscripts / Manuscript Central (Clarivate — Wiley, IOP), the APS's own portal at authors.aps.org, and Nature-family journals' manuscript-tracking system.

The Ingelfinger rule, relaxed

An older, stricter norm once treated prior public disclosure as disqualifying. Physics, Nature, and Science now all explicitly permit preprinted submissions — though a journal's current policy is always worth checking.

9.6 · WHAT THE SUBMISSION FORM ACTUALLY ASKS FOR (1/2)

Identity, classification, and where the data lives

- 1 **Full author list, affiliations, ORCID** a persistent identifier now increasingly mandatory for every author, not only the corresponding one — disambiguating a researcher from anyone who shares their name.
- 2 **Subject classification / keywords** once standardised across physics through the PACS scheme, retired by the APS during the 2010s in favour of free-text terms and arXiv's own subject categories.
- 3 **Data-availability statement** where and how the underlying data can be accessed — tied directly to Chapter 8's FAIR-data expectations, and, under funder open-science mandates such as cOAlition S / Plan S, no longer optional.

Disclosures that protect the record, not just the reader

- 4 **Conflict-of-interest / competing-interests disclosure** financial relationships (employment, consulting, patents, equity) and relevant non-financial ones, for every author — and used separately by the editor to screen potential referees for the same conflicts.
- 5 **Open-access and licensing choice** subscription route versus “gold” open access funded by an article-processing charge (APC) under a CC-BY licence — increasingly constrained by funder mandates rather than left entirely to the author.
- 6 **Ethics approval, where relevant** an institutional review board or ethics-committee reference number — near-universal outside physics, occasional within it (biophysics, medical physics).

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After Submission: Peer Review, Decisions, and Proofs

From editorial screening to a DOI'd Version of Record.

Screening, referees, and the rebuttal letter

- 1 Editorial screening** checked against scope, quality, and any hard length limit — a PRL manuscript over the page limit is returned to the authors without ever reaching a referee.
- 2 Peer review** typically two or three referees selected by a handling editor, avoiding the conflicts of interest disclosed at submission; their reports lead to accept, minor revision, major revision, or reject — sometimes with encouragement to resubmit.
- 3 The rebuttal letter** a point-by-point response to every referee comment, stating exactly what changed — often the single most consequential document an author writes in the whole process.

Proofs, and the Version of Record

The proof

After acceptance, production typesets the manuscript into house style and generates a proof — historically a “galley proof.” The corresponding author is given a short, firmly enforced window, typically 24 to 72 hours, to check it.

What is, and is not, allowed

Fixing a typesetting error, a missing grant number, a misspelled name, a genuine factual slip — yes. Rewriting sentences, restructuring the argument, adding new data — refused outright or routed back through editorial approval, sometimes at the author's expense.

Then: online first, and a DOI

Once corrected, the paper is typically published “online first” with its own DOI ahead of any print issue — the citable Version of Record.

Bibliometrics in Practice: Measuring a Researcher, Measuring a Journal

Once a paper reaches the Version of Record, both it and its authors start accumulating the citation-based numbers Chapter 8 introduced in principle.

9.8 • THE SAME RESEARCHER, THREE DIFFERENT COUNTS

Google Scholar, Web of Science, and Scopus

Database	Access	Coverage philosophy	What it computes
Google Scholar	Free	Broadest: journals, preprints, theses, books, conference proceedings	Author profile: h-index, i10-index (auto-updated); journal h5-index
Web of Science	Subscription (Clarivate)	Curated “Core Collection” of selective, indexed venues	Journal Impact Factor (JCR, annual); author h-index via ResearcherID
Scopus	Subscription (Elsevier)	Broader than WoS, narrower than Scholar	CiteScore, SJR, SNIP; author h-index; Field-Weighted Citation Impact (SciVal)

Because grey literature and conference proceedings inflate a count a curated index excludes, Google Scholar figures for the same researcher are typically the highest of the three, Web of Science the most conservative, and Scopus in between.

A researcher's profile, unpacked

i10

i10-index Google-Scholar-specific: the number of a researcher's papers with at least ten citations each — cruder than the h-index, but easy to read at a glance.

g

g-index gives more weight to a researcher's most highly cited papers than the h-index does, so a handful of exceptional results can move it even when the rest of the record is modest.

m

m-quotient h-index divided by years since first publication — a deliberate attempt to make the h-index comparable across career stages rather than mechanically favouring whoever has published longest.

FWCI

Field-Weighted Citation Impact (Scopus / SciVal) normalises a citation count against the average for the same field, year, and document type: exactly 1.0 is precisely average; above or below reads as a direct multiple of the field average.

Illustrative h-index ranges — and why DORA still applies

Historiographical note

A beginning PhD student typically has a handful of papers and a single-digit h-index; an established senior researcher in an active subfield is often, but by no means always, somewhere in the range of roughly 20 to 40; the most highly cited figures in a field can exceed 60 or 100. These are order-of-magnitude illustrations, not targets — they depend enormously on field size and citation culture, career stage, and co-authorship norms (a large collaboration paper mechanically inflates every listed author's count). Chapter 8's account of DORA applies with full force: these numbers describe a record, not a verdict on the quality of the work behind it.

9.8 • FIVE WAYS TO SCORE A JOURNAL

JIF, CiteScore, SJR, SNIP, and Google Scholar's h5-index

JIF

Journal Impact Factor (Clarivate, JCR, annual) citations in a given year to a journal's citable items from the two preceding years, divided by the number of those items — a two-year window, with a five-year variant for some journals.

CS

CiteScore (Scopus) a several-year citation window (currently four years), recalculated monthly rather than once a year, and counting a broader range of document types than the JIF.

/
SNIP

SJR and SNIP SJR weights each citation by the citing journal's own prestige (scimagojr.com, free); SNIP normalises for field-specific citation practices, enabling fairer cross-field comparisons.

h5

Google Scholar h5-index / h5-median free, journal-level — the h-index and its median, computed only over each journal's articles from the last five complete calendar years.

9.8 · FOUR JOURNALS FROM THIS CHAPTER, ONE SNAPSHOT

Current Journal Impact Factors — a number that moves

Journal	JIF	Note
<i>Nature</i>	56.1 (2025)	up from 50.5 just three years earlier (2022)
<i>Science</i>	45.8 (2024)	
<i>Physical Review Letters</i>	9.4 (2025)	
<i>Physical Review B</i>	3.7 (2024)	typical of a large, specialised, high-volume physics journal

A snapshot, not a constant

Clarivate republishes the JCR annually, and a journal's JIF can move substantially year to year — Nature's own figure above rose by more than ten percent in three years — for reasons including genuine shifts in citation behaviour, methodology changes, and editorial choices about what counts as a “citable item.”

San Francisco Declaration on Research Assessment (2012)



What it says drafted at the December 2012 annual meeting of the American Society for Cell Biology in San Francisco: funders, institutions, and journals should stop using the journal impact factor as a proxy for the quality of an individual article or researcher in hiring, promotion, or funding decisions.



Its more specific recommendations journals should stop actively marketing their JIF; any institution that does use a quantitative metric should report it alongside a range of complementary indicators — an early, 2012 statement of the same multi-metric caution this section has taken throughout.



Who signed thousands of institutions and individual researchers worldwide since 2012, including, in France, the CNRS in 2018 — though how consistently practice matches that commitment remains an uneven, still-debated question.

The one-line takeaway

None of this chapter's metrics — for a journal or for a researcher — measure the quality of any single paper. They are citation-based proxies, useful for some purposes, and not immune to being gamed.

FURTHER READING



APS Journals, Length Limits and Guidelines for Physical Review Article Types, journals.aps.org/authors/length-guide



CRediT (Contributor Roles Taxonomy), credit.niso.org



Clarivate, Journal Citation Reports (annual), jcr.clarivate.com



Physical Review Letters, Information for Contributors and Style Basics, journals.aps.org/prl



ORCID, orcid.org



Google Scholar, Google Scholar Metrics Help (h5-index, h5-median), scholar.google.com



Springer Nature, A Brief Guide to Initial and Revised Submissions, nature.com/nature/for-authors



cOAlition S, Plan S: Making Full and Immediate Open Access a Reality, coalition-s.org



SCImago Research Group, SJR — SCImago Journal & Country Rank, scimagojr.com



Science/AAAS, Information for Authors, science.org



Committee on Publication Ethics (COPE), Core Practices, publicationethics.org



Elsevier, CiteScore Metrics, scopus.com/sources



ICMJE, Defining the Role of Authors and Contributors, icmje.org



Overleaf template gallery, overleaf.com/latex/templates

Chapter 9

Questions?

The categories a good referee checks for — sourcing, reproducibility, honest uncertainty, a modest conclusion, a truthful contributions statement, an accurate bibliography — are exactly what this chapter has just walked through as things to write, not only to detect.