Scientific papers, their publishing and presentations

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A naturalist’s life would be happy one if he had only to observe and never to write (Charles Darwin).

In science, no matter how spectacular the results are, the work is not completed until the results are published.

The purpose of this presentation is to help students to prepare the manuscript and to show all steps from the rough manuscript to published paper.
From an idea by help of rules to the published paper

- kinds of scientific written communication
- scientific writing in general
- IMRAD format
- paper organization
- paper writing
- paper submission
- the editing process
- proof-reading
- … and pointers to reading
Scientific written communication

- Reports
- Theses or dissertations
- Journal articles
- Slide presentations
- Posters
- Books and book chapters
- Technical manuals/users guides
- Research or grant proposals
Scientific writing in general

- Subject
- Purpose
  - to exchange the scientific knowledge
  - to ask and answer specific questions
- Audience
  - scientists and those interested in the subject
  - a publisher or an editor
IMRAD format

- Introduction
  - What problem was studied? What others and you did?
- Methods
  - How do you did it?
- Results And
  - What you found out?
- Discussion
  - What your findings mean?... and future plans

Remember: writing helps you to think and to learn. Don’t misjudge your audience. They can tell you when you are bluffing and when you don’t believe what are you saying or doing. Write clear and simple, the science is not an entertainment.
Other types of journal papers

- State-of-the-art
- Review
- Bibliography
- Technical notes
- Letter to the editor
Steps in scientific journal writing

- Cowriters
- Referees
- Writer
- Journal editor
- Readers

- Writer → Journal editor
- Journal editor → Readers
- Cowriters → Referees
Paper organization

Introduction

- call attention to the specific subject, define the problem
- provide background and present the results of other studies (literature review)
- list the structure of your research project and what you plan to present in your paper

Reading a scientific article isn’t the same as reading a detective story. We want to know from the start that the butler did it (Ratnoff, 1981)
Paper organization

Methods
- complete information of materials and methods used, conditions present, actions, experimental design, etc.
- this section usually has subheadings; when possible match those to be used in Results
- enough information must be given so that the experiments could be reproduced
- ask a colleague if he/she can follow the methodology
Paper organization

### Results

- display of data with logical development showing how your findings satisfy your objectives
- where possible give illustrative examples and compare those with known results from literature
- use tables and figures
- ”the fool collects facts; the wise man selects them” (J. W. Powell, 1888)
Paper organization

Discussion
- the hardest section to write, you discuss, you do not recapitulate the Results
- show the relationship among observed facts
- state your conclusion as clearly as possible
- summarize your evidence for each conclusion
- end with a short summary/conclusion regarding the significance of your work
Searching scientific literature

- Explore ideas to your subject
  - gaps in research on a subject of interest
  - existence of any duplication to your work
- Conduct a specific search
  - manually in the library
  - on-line searching
- Keep up-to-date with the specific subject
Literature review

- Developing an outline
  - chronological arrangement
  - comparison and contrast in contraversional theories

- Creating a skeleton
  - select a few documents and write about each
  - discern the main points of their contents
A rough draft is ready but ....

- Will you have co-authors?
- Which journal to submit your manuscript?
- How soon will it be published?
- How to deal with editors?
Journals - Publishers

Professional societies

- AIAA
- ASCE
- ASME
- IEEE
- SIAM

Professional publishers

- Elsevier
- Pergamon Press
- Springer Verlag
- J Wiley & Sons
- Kluwer Academic Publishing
- MCB University Press
- IOP Publishing
- Academic Press
Where to submit the manuscript

- The prestige factor
- The circulation factor
- The frequency factor
- The audience factor
Journal Citation Reports

jcrweb.com

Information for New Users

Welcome to the Journal Citation Reports on the Web (JCR Web). JCR Web provides easy access to data that helps you evaluate and compare scholarly journals. Please read the overview sections (see the Table of Contents on the left) for information about what the JCR is and how it can be used.

Refer to the JCR Home Page help for information on selecting a database and a query option.

The JCR Web, like the JCR on CD product, is an essential, comprehensive, and unique resource tool for journal evaluation, using citation data drawn from over 8,400 journals from over 3,000 publishers worldwide.

The JCR is the only source of citation data on journals, and includes virtually all specialties in the areas of science, technology, and social sciences. The JCR can show you the:

- highest impact journals
- most frequently used journals
- hottest journals
- largest journals

Please refer to the Using the JCR to Find... section in the Table of Contents on the left for a list of tasks you can perform using JCR Web.

Please refer to the JCR Web Pages section of the Table of Contents on the left for a list and a flowchart of the web pages at this site.

Note: JCR Web is best viewed at a display resolution of 800 x 600 or higher.
Paper writing

1. Write a rough abstract first or start text in the middle
2. A rough draft is ready
3. Select the journal and read Instructions to Authors (manuscript requirements: style in headings, the system for citations, figures and tables, etc.)
4. Write the final manuscript
The final draft

- **Front Matter**
  - Title (fewest possible words that describe the contents)
  - Author’s (co-authors) name and address
  - Abstract (miniversion of the paper, no citations)
  - Keywords

- **Article Body**
  - Introduction
  - Theoretical and experimental sections
  - Results
  - Discussion/Conclusion

- **End Matter**
  - Acknowledgment (technical help and financial assistance)
  - References (at 52 journals were found 33 different styles for listing)
  - Appendixes
Abstracts

- Descriptive abstract
  - or topical abstract, describes the contents but contains too little substance and detail

- Informative abstract
  - self-explanatory report on a scientific investigation (research objectives for conducting the investigation, the basic method used, and the results and significant conclusions) - 200 to 250 words

- Extended abstract (conference proceedings)
Citations and references

- For a better credibility you have to review the literature and show that your contribution extends from a solid foundation of research.
- Quality and quantity of the sources you have consulted will enhance your work.
- You have made it possible for readers to retrace your steps.
- Your references can be as valuable as your research methods and findings.
- At least three citation styles (in-text citations) and 100 reference styles are commonly used.
Citations: Alphabet-number system

Examples in the text

- In 1986 Schmitt (10) developed a ....
- With optimum design sensitivity (10) ...

References

Citations: Name-year (Harward) system

Examples in the text:
- Schmitt (1986) developed a …
- With optimum design sensitivity (Schmitt, 1986) ….

References

Note: list of references in author alphabetical order
Citations: Order of citation (Vancouver) system

Examples in the text

- In 1986, Schmitt (1) developed a .....  
- With optimum design sensitivity (1) .....  

References


Note: list of references not in author alphabetical order
Ethics of scientific writing

- Avoid the dual publication
- Don’t use the work of others without appropriate attribution
- List only those co-authors who contributed substantially to the work
Final submission

- In-house reviews are required?
- Submit the paper to the journal’s editor (only to one journal)
  - Hard-copy of manuscript (usually three or more copies)
  - Disk of the same version
    - Text: Word, Word Perfect, TeX/LaTeX, etc.
    - Figures: tif, gif, postscript, etc.
Editing process

1. Editor logs a manuscript and send an acknowledgement that the paper has been received.
2. Editor sends the manuscript to reviewers.
3. On the basis of the reviews and the editor’s opinion, your paper will be accepted, conditional accepted, or rejected.
Editors

I expect the editor to accept all my papers, accept them as they are submitted, and publish them promptly. I also expect him to scrutinize all other papers with the utmost care, especially those of my competitors.

- Dr E H Wood, Mayo Clinic
# Checklist for referees

**Studies in Earth Science**

**CONFIDENTIAL REVIEWER'S REPORT**

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<td>As far as you know, has this material been published before in English?</td>
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<td>Does the scientific content justify the space it will occupy?</td>
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**— PUBLISH AS SUBMITTED —**

**— DO NOT PUBLISH —**

**— PUBLISH WITH MAJOR REVISION —**

**— PUBLISH WITH MINOR REVISION —**

**COMMENTS:** Please use a separate sheet to expand on the above and to suggest changes that you feel would improve the manuscript, in particular with regard to its length.

Signature: ___________________     Date: ___________________
# Proof-reading

- Proof-reading and return to the editor
- Copyright transfer
- Offprint order

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Davis, M. *Scientific Papers and Presentations*, p.88
Congratulations
Bibliography

• Michaelson, H. B. How to Write and Publish Engineering Papers and Reports, 3rd Ed., Oryx Press, 1990
... and more books

- Reynolds, L. and Simmonds, D. *Presentation of Data in Science*, Nijhoff, Hague, 1983