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How to organize the preparation of a scientific paper

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Abstract

Preparing a scientific paper requires practice and organization. Some suggestions are offered to optimize the process, especially for Ph.D. students and for young scientists collaborating with (one or more) experienced colleagues. After an overview of general considerations, a step-by-step organizational procedure is suggested to streamline the article preparation process.

1 To whom this note is addressed

This note is a contribution which aims at offering some advice to Ph.D. students and Young Scientists¹ in the Natural Sciences (and Mathematics) who are confronted with the writing of a scientific publication. As always, advice depends strongly on people: what works well for someone does not for another person. Thus, the best way of profiting from it is to compare various sources (which exist in abundance on this topic) and to take what is most suited to one's needs and style. In addition, different disciplines have separate requirements², thus it is a good idea to also ask around for more information in one's field.

The scope of this contribution is help palliating difficulties which at times arise in preparing a scientific manuscript, which may end up into a *writer block* or *fear of the blank page*. Two outcomes are common in these situations: either the page remains blank, or it is filled – at times lavishly – with sentences which, upon later reading, convey little or unintelligible information. Both lead to a sense of frustration: the young writer feels inadequate to the task; the more experienced colleague (e.g., the Thesis Advisor) faces the daunting task of rearranging confused, poorly written information. Indeed, one of the natural reactions to feeling overwhelmed by the task is to start writing long circumlocutions whose sense is clear (at best) only to the writer. This is particularly true for non-native speakers who have to face the additional difficulty of more limited vocabulary and syntactical choices.

The unfortunate consequence is a negative impact on the young colleague's writing and productivity; it is therefore important to aim at palliating the problem before it arises. I hope that the suggestions of the present contribution will result in a happier and more productive experience for all involved.

The writing of a paper can be *decomposed* into three main parts:

- A. **Organization** of the writing task and structuring the manuscript. This is the main objective of this note and will be detailed in the following.
- B. **Writing style**. Since English is the international scientific language (at least in the sciences targeted by this note) and most writers are native speakers of another language, there is a double hurdle to be overcome: linguistic proficiency (for grammatical and syntactic correctness), and effective communication.

¹In the following, I will be referring only to “Thesis Advisors” for simplicity. Since this note is addressed also to young colleagues, possibly beyond their Ph.D. Thesis, read in place of *Thesis Advisor* an *Experienced Collaborator* (e.g., the head of the research group).

²My advice may be more suitable to physicists, since this is my field.

- B.1 No specific advice will be given here for English language help for non-native speakers. Everyone working in the sciences is nowadays sufficiently proficient to communicate in English, but writing may raise additional difficulties. It is possible to find online help for grammar and syntax³.
- B.2 Scientific writing advice: this may vary somewhat from one discipline to the other, but there are some basic rules that hold for all, such as conciseness and precision. There is no point in repeating excellent advice that has already been given⁴, but my general recommendation is to look for contributions on the web.
- B.3 I personally recommend the use of free synonym online dictionaries – numerous and overall good – which help avoiding disturbing repetitions: the less proficient the writer with the English language, the more frequent the word recurrence. You will quickly identify, by trial and error, your preferred web sites. Bilingual dictionaries, numerous on the web, can also be useful but my recommendation is to compare the offered translation to a range of synonyms. The proposed translation may not be the most suitable to your needs. Google Translate is a nice tool, but my advice is to use it with moderation when you write a scientific text. Its translations are of fairly good quality but, in my opinion, they do not stand up to the desired level for a scientific paper. Finally, I would like to transmit one piece of advice I have heard multiple times from native English speakers and that ought to be treasured. An often needed and (mis-)used verb in scientific writing is “to allow”: unless you are a native English speaker (or exceptionally proficient in that language) ban it from your vocabulary and replace it with a synonym. The cause of its misuse is its need for a preposition, unnatural to the non-native speaker.

- C. **Technical writing style** deals with presentation: figure preparation, recommended font size, formatting, numbering, insertion and punctuation with equations, etc. Each journal has its own guidelines, which ought to be checked before getting down to truly writing the paper. Some of the guidance, however, is broader and covers a whole discipline. Thus, it is always good for the newcomer to familiarize oneself with the general usage by consulting the technical advice (often offered by Scientific Societies and/or by their non-profit journals⁵).

To summarize this introduction, adapt the various suggestions (preceding and following) to your needs and supplement them by searching the Web for resources. The amount of advice freely available is very abundant and, by careful selection, you can find practically anything you need. A useful summary on how to write a scientific paper can be found at:

<https://www.grammarly.com/blog/how-to-write-a-research-paper/>

2 Choice of journal

Each discipline and each journal have their own characteristics. Choosing the right journal is in itself a crucial step that needs to be discussed with your Thesis Advisor. In fact, the preparation of the manuscript will depend, in its more advanced stages, on the journal choice, since the text has to

³A well-advertised, free site, is the following: <https://www.grammarly.com/>
There are certainly others, but I haven't checked any of them. Interested people are invited to search the web.

⁴General scientific writing style tips are effectively conveyed by Barbara Goss Levi, a Senior Editor at Physics Today – they can be downloaded at: <https://www.aps.org/publications/apsnews/199806/rules.cfm>
K. Friedman, at *Reviews of Modern Physics*, offers a detailed list of advice on scientific writing. Although some parts are somewhat specific, anyone can benefit from reading the text, available online at: <https://d22izw7byeupn1.cloudfront.net/files/rmpguapa.pdf>

⁵A good technical style and notation guide for physics is freely available online at: <https://cdn.journals.aps.org/files/styleguide-pr.pdf>

match the goals of the chosen journal. In spite of the differences among branches of science, two basic kinds of publications can be identified in the bibliography: Letters and Archival papers (finer details may vary with discipline and publisher).

In broad terms, a Letter is a short report on original research which focusses on **an** outstanding finding. The emphasis on the indeterminate article signifies that there must be **one** central point (with a couple of side points which may be needed to corroborate it) of sufficient importance to justify the communication, rather than an ensemble of results. Often the Publisher will require the Letter to have a sufficiently broad scope to be useful to an audience beyond a strict specialty. A Letter may also be useful to give advance notice of an important result to the research community. As such, it should concentrate on the main message, giving the strictly necessary details for supporting the statements. In this case, it is expected that the Letter be followed by an Archival publication, which will contain the full details of the investigation and will also dwell on side issues which are important for the specialized community, but unnecessary for the broader audience.

An Archival publication, instead, presents original research, with a complete overview of the general context and existing literature (relevant to the specific work – a Review paper instead will summarize and discuss a large amount of literature covering a given field). The problem to be solved is explicitly stated, together with the work methodology, the conceptualization of a solution, and the theoretical (or experimental) background which complements the investigation. The data are presented, together with the (experimental) acquisition or (theoretical) computational methodology, their analysis, discussion and conclusions. If a Letter has preceded the Archival publication, new findings that may have appeared – e.g. following discussions and debates, or simply as a consequence of additional work – will be explicitly added and discussed in the archival presentation.

These are just generic guidelines which classify the two main kinds of publications used in the natural sciences for the dissemination of original research. The main burden of journal selection falls on the more experienced researchers; however, once the journal has been chosen it is good practice for the younger collaborator to go and read the Publisher's description on the targeted journal's scope and read the advice on the expected paper content and structure.

3 Your manuscript

Before starting with a technical point-by-point description of an organization strategy, we are going to review the points which need to be addressed in the preparation of a paper (this list should be supplemented, at least, by the one given at the end of Section 1 – cf. *grammarly site*). The first point you need to have in mind is the **message** that you want to disseminate. Not only do you need to know what the message is, but it has to be clear in your mind, both as a concept and as a sequence of the steps needed for its presentation. Keep in mind that you may think the ideas obvious, but discover that the process needed for their explanation may be a lot more complex than expected. Discuss it with your Thesis Advisor and/or Coworkers to see whether: 1. your arguments are well-structured, clear and convincing; and 2. you are correctly targeting the Readership you want to address.

The Readership choice has been crucial in determining the journal. As already mentioned in section 2 this choice conditions the form of presentation and, in turn, influences the organization of the paper in terms of arguments (general and broad for a Letter, more technical and specialized for an Archival publication) and of level of detail.

Having a clear idea in mind of how and for whom you want to pitch your contribution will help you defining the organization of the manuscript. As a reviewer for journals, I have encountered situations where the targeted audience and the style did not match: for instance a very detailed and pedantic presentation for a paper destined to attract interest from a wider research community. If one wants to attract non-specialists to a new field, the paper must give the broad lines and stress the novelty and importance of the results, inciting others to seek for similar features in other systems. In such a case, writing several pages to discuss all the little details of their particular implementation is neither

going to attract Readers outside the specialty, nor is it going to render the paper understandable, as non-specialists will get lost in unnecessary details.

The definition of scope and target, thus the presentation strategy, may take a few attempts before reaching a satisfactory level, and discussions with Colleagues and Thesis Advisors are certainly a very useful way of meeting the challenge, thus highly recommended. The investment will be well-justified, since it will later make you gain time by avoiding lengthy (even multiple) text rewritings before the correct harmony is found.

The following practical advice for organizing the writing of a paper may appear a bit long and painstaking. It is purposefully detailed and broken up in many steps. If you feel comfortable with the preparation of your paper you can compact some of the proposed steps together, reducing their number. The reason for presenting them separately is to offer the most detailed break-down, from which one can more easily construct personalized procedures. In addition, there are always situations where the task becomes harder (for instance, writing a more complex paper) for which the more parcelled version of the planning may become useful. Finally, and generally true, the *perfect advice* does not exist; there is only advice from which you can select what works best for you. Thus, this is just a proposal from which anyone can shape their own procedure. In the end, with growing experience, anyone develops one's personal way of working. This scheme becomes, therefore, the fall-back, basic plan.

4 Detailed plan

Practically, we can break down the organization process into a few steps, each with substeps.

Step 1: Determining the paper's message

- Preliminary step

- ★ Prepare a list of ideas/results you want to present in your paper

✓Checkpoint No. 1

- 1.1 **Check with your Thesis Advisor** (and/or other experienced Coworkers, if appropriate) which parts of the content you suggest are suitable for a scientific publication. As a young researcher, your perspective is often very narrowly focussed on your work. Thus, you risk emphasizing details which are not so important (or are already known) while you might overlook aspects which would hold weight with the research community. This is not a shortcoming of yours, but simply the consequence of being a beginner in the field; experienced researchers who change field would do the same, consulting with colleagues who are recognized experts before embarking on projects and publications.
- 1.2 Decide with your Thesis Advisor the form of the paper (Letter or Archival) and determine the journal you want to submit to – the latter may not be a final decision, as there may be the choice left between two or three suitable journals. At this stage this suffices, as you don't need yet to closely follow the formatting instructions of any journal (it will come later).

Step 2: Organizing the manuscript's structure

- Now that you have agreed on the main content of the paper and its format (short or long paper, i.e., Letter or Archival) go ahead with the following steps
 - ★ Organize your paper by determining what are the needed sections (e.g., experimental setup, model description, mathematical background, etc.)
 - ★ Make sure you have a section for your results
 - ★ Make sure you have a section for their discussion
 - ★ Choose provisional section titles more appropriate than the generic categories suggested above. This helps you focus on the message contained in each section. This advice does not hold for those journals and research fields which, unfortunately, stifle the creative process of result dissemination by imposing a set structure (and title sections). In spite of this, even in those cases this step remains a useful practice.

The main purpose for dividing your work into *sections* is to help structuring the communication. If your paper is a letter, which is typically a brief communication devoid of sections, you will eventually remove all your *section headers* and transform your manuscript into a single section.
 - ★ If possible, choose now the text editing mode (Word or LaTeX) which will allow you to make the submission. This amounts to a gain in time, as you won't have to convert later to a different tool. If you by chance already know to which journal the paper will be submitted, then you can even download the template and write your notes directly into it. Otherwise, for those disciplines in which there is a general-purpose format accepted by several journals (LaTeX has some basic, standard formats, which can be later adapted) it is a good idea to select it.

✓Checkpoint No. 2

- 2.a **Show your plan to your Thesis Advisor** or any other Designated Collaborator (depending on the organizational structure of your group)
- 2.b **Get feedback**, making sure that you fully understand the suggestions and note down their implementation. It is alright to ask questions and request clarifications, as it is crucial to fully understand the instructions. A good job at this stage can save you precious time and frustration at a later time.

Step 3: Inserting content into the section structure

- The task is now to start putting content into the structure you have planned. At this stage you are writing *bullet points*, not full text. Writing full sentences (and good English) may take the focus away from content. Thus, concentrate on ideas and substance.
 - ★ Collect the thoughts and ideas which belong to each of the sections you have outlined in the previous step; *each idea will become a subsection*
 - ★ For each section, describe each **idea** in a couple of lines, **one idea per subsection**. This subdivision is artificial, but useful to categorize and prioritize the rank that each thought or point has at this stage (you will most likely remove most of the subsections, at the end).
 - ★ For those ideas that need further development, introduce additional subsections each containing a single argument that needs to be made. You can repeat the process as in a chain (which eventually will end) if the idea requires multiple levels of discussion. Make sure you identify the level in the sequence of subsections to which each argument belongs.

This chain-like structure allows you to **identify the sequence of steps** needed to prove your point and can be invaluable in gaining time and preparing a much clearer discussion.
 - ★ Remember that subsections may contain equations, figures or any other means of explanation. All these tools are part of the presentation and should be seamlessly integrated in your exposition.
 - ★ Remember to insert, at this stage, the arguments from the literature which back up your statements (or those papers to which you want to compare your work). Make a note of the paper(s), book(s) or whatever support you will need for the statement; the reference must be clearly identifiable, even if the full citation is not developed. This is a work in progress, but the literature should appear now.

✓Checkpoint No. 3

- 3.a **Show the content you have prepared to your Thesis Advisor.** There should be enough detail to be understandable; however, it is not impossible that the formulations are understandable only to you. Thus plan for a live discussion to present your ideas point by point.
- 3.b **Record the feedback throughout the discussion.** It is very likely that, while discussing the various points you have prepared, necessary changes may surface, such as modifications in priorities, order of presentation, changes in the arguments, etc. Note them down in real time (on paper or directly in an electronic file) and make sure you have enough detail to reconstruct the arguments and the changes. Also, verify that your bibliography is suitable; if additional references are needed, make sure that you have an unambiguous way of retrieving it and that the points to be made in its respect are clear to you.
- 3.c In the course of the discussion, the need for some additional checks/work may emerge, required to better support your findings. It is a good timing for it and you should neither be surprised

nor worried. Typically, it is a matter of additions which do not required a large amount of work, but which can bring substantial benefits.

3.d Discuss with your Thesis Advisor whether the journal choice can be finalized, now that the paper structure and content are well established.

3.e You should be leaving the meeting (or written exchange) in a condition to start writing out the text (and, if needed, carry out the additional checks).

Remark: it shouldn't have escaped your attention that so far you have not written, and not even planned three of the required parts of the manuscript: abstract, introduction and conclusions. You may also have only a very preliminary title – just to have an idea of where you are going.

This is quite alright, since these sections have to be adapted to the content of your paper and until the latter is well-defined you would be waisting your time working on them.

Step 4: Writing the first version of your main sections

- The aim of this step is to detail the material that you have laid out and start writing the text of your main sections, using the outcome of the last exchange with your Thesis Advisor
 - ★ Develop the points that you have made, first subsection by subsection, then working your way up to each section. Your text may not yet flow entirely, but you should have full sentences that clearly develop the concepts.
 - ★ Remember to insert the literature citations in the appropriate spots while you are writing the text.
 - ★ You may go through the text in more than one pass if this makes the writing easier. Don't be afraid of completing a subsection half-way down. If your organization is good, you should be able to write the different parts semi-independently – you will only need to make connections in a later global reading, if the text does not flow.
 - ★ Remember that text composition can be best done in stages. Write a first version, then set it aside. When you come back to it, you can better see what is unclear and needs amending. You can iterate as many times as needed.
 - ★ When writing don't forget the opportunity offered by online writing help (I previously mentioned the *grammarly site*, but there are others); this may lighten your work by checking for mistakes and fluidifying the presentation.
 - ★ The choice of journal should have been finalized in your last meeting (checkpoint 3.d). If this is still not the case, bring this point up either in writing (e.g. email) or in the next meeting. But don't delay this step.
 - ★ Together with the journal choice, it is now time to go and read the guidelines. If the journal offers a template (whether LaTeX or Word style) it is now time to convert your draft into that format (unless you have already done this).

✓Checkpoint No. 4

- 4 This step will most likely require a serious reading, thus you should first hand-in (or send-in electronically) your text. You should be receiving written comments from your Thesis Advisor (or designated Coworker). If your text was not yet written in full English form, you will have received a return on the skeleton, otherwise the comments can even contain a first round of corrections. After you have read the comments, you can ask for an in-person meeting to clarify any (likely) outstanding point that you don't understand or on which you disagree.

This step is optional and can be run in parallel with step 4**Step 4A: Preparing Supplementary Material**

- This step, numbered 4A, is (nearly) independent of the writing of the main paper, as it concerns the preparation of additional material. It is not a mandatory step. It concerns various forms of complementary information that the Authors may wish to make available to Readers, through the electronic posting of specialized sections (often called Supplementary Material) with technical information providing useful, but not essential, support. Instances may include lengthy mathematical derivations, computer codes, additional figures, construction details for an experiment, technological points, etc. Depending on the Publisher, it may also be possible to publish data, animations, high resolution and/or interactive figures, videos, etc.
 - ★ The position of this step in the sequence of tasks is somewhat arbitrary. This is the first place where it makes sense to start considering it. Any later time is also possible (of course, before submission!).
 - ★ After verification of the Publisher’s offer for posting Supplementary Material [**check:** some Journals do not accept it!], discuss with your Thesis Advisor – in one of your meetings or by email – whether it would be beneficial to your manuscript. Remember that this section cannot be used to squeeze into a limited number of pages a paper which would require several more – the Supplementary Material is only an optional complement; the paper must remain fully understandable without it.
 - ★ Evaluate and discuss with your Advisor which form of Supplementary Material would be useful for your paper: additional section, video, etc.
 - ★ Since this Material focusses on technical issues, it will be easier to write. You just need to present/explain the content.
 - ★ Although the *optional* nature of this section may (apparently) lessen its importance, nonetheless, it should be carefully written. A poorly prepared Supplementary Material will induce a negative opinion on the work⁵.
 - ★ It is a good idea to search for articles similar to yours in your targeted Journal to find Supplementary Material sections. From them (possibly a few) you can get an idea of the typical style for this section.
 - ★ In order to prepare the Supplementary Material, follow the same steps that you have used for your main sections.

⁵ It is unfortunately not uncommon, at least at the reviewing stage, to read Supplementary Material sections that haven’t been properly drafted. In this case, you compromise your reputation with Reviewers and Journal Editor.

✓Checkpoint No. 4A

- 4A You can choose to treat the task separately, sending materials to your Thesis Advisor for her/his revision on the Supplementary Material. Most of the exchanges should be doable by email, as the preparation of this section is more straightforward: it only contains technical information and can be rather *dry in style*. It is crucial, however, to be complete, clear and to avoid mistakes (grammar, syntax, typos, etc.). In-person discussions on this task can probably be embedded into another scheduled meeting.

The following step [5] can be run in parallel with step 4.

At variance with step 4A, it is not optional and is of crucial importance.

Whether you want to prepare it in parallel with point 4 or not will depend both on your preferences and on the availability of your Thesis Advisor or collaborating Co-Author. If it is difficult to get an appointment, then you may want to go ahead with point 5 at the same time as 4, since the procedure is that of steps 2 and 3.

If your Thesis Advisor is easily available, then you can treat this task as a separate one.

In any case, you should be aware of the fact that both 4 and 5 are substantial steps which require a considerable time investment: they shouldn't be taken lightly.

Step 5: Planning Conclusions, Introduction, Abstract (and Title)

- Since the organization of the main body of the paper (i.e., your original work) is now completed, and since you may have already written a good first draft for those sections, it is now time to start considering the *trimmings* – i.e., what follows and precedes the core of your presentation.
- **Remember:** although these parts are *accessories* to your core message, their role is of paramount importance in attracting (Title and Abstract), leading and engaging (Introduction) the Reader, as well as in making sure that the central points have been duly understood and retained (Conclusions). It is therefore crucial to pay as close an attention to these sections as you have done with your core work. The reason for *delaying* their preparation is that they have to ***be adapted to your original contribution*** (and not vice-versa). Advancing their writing would most likely result in a waste of time and effort, because they would later have to be reshaped to match your message.
 - ★ Start working from the Conclusions section and apply the previous **Steps 2 and 3** – with their corresponding checkpoints.
 - ★ This time, you want to make a list of the points that your contribution is making. Prioritize them and break them down in sections and sub-sections, as you have done to present your original work. Remember to concentrate only on the main points and refrain from the temptation of including every single detail of your paper: only the most important results should stand out here. As for the main text, you should write the text only after a check with your Thesis Advisor.
 - ★ Remember the acknowledgments section (check with your Thesis Advisor and Coworkers, as well) both to recognize help you may have received, as well as support (financial or otherwise).
 - ★ Now apply **Steps 2 and 3** to the Introduction. The latter is probably the most difficult part to write, as it must give critical overview of the literature relevant to your contribution, placing it into the general context. Prepare your work well and expect the need for detailed discussions with your Thesis Advisor and Coworkers. Remember to apply the advice previously seen at **Steps 2 and 3**.
 - ★ Repeat the procedure with the Abstract. Check the journal's rules (often there is a length limit). Read abstracts from the journal in which you are going to publish to match the style. Make a bullet list of the two-three main points that you are making in your manuscript. Write the abstract in very concise form. Even though the abstract is very short, you will probably need to discuss it with your Thesis Advisor more than once, given its importance: the abstract is at times the only piece of information available to potential Readers, who will decide, on its basis, whether they are interested in your work
 - ★ The Title is the ultimate *advertisement* for your paper and its appearance as last item shows that it has to be a one-line, eye-catching summary of your paper. It has to be carefully thought, given its necessary brevity and importance. Use the same criteria as for the abstract and plan for repeated exchanges with your Thesis Advisor. It may be a good idea to conceive more than one version of the title to explore various possibilities.

✓Checkpoint No. 5

- 5 Since the organization exercise for these sections is the same as what has been done for Steps 2 and 3, you should expect to check with your Advisor on the structure of your proposed Conclusion, Introduction, Abstract sections and Title. The procedure will be the same as already practiced for the body of the paper. Make sure you include in your meeting a discussion of the title (cf. last point of the list).

Step 6: Last iterations

- The main body of the paper is now at a stage where it is being polished, both for details and English presentation.
 - ★ Polish the writing, adding all the details left out so far (if any) and make use – if needed – of online writing help.
 - ★ Make sure to follow the style guidelines of the selected journal for the presentation of figures, equations, etc.
- The Conclusions, Introduction and Abstract are one step behind (equivalent of step 4 for the main paper).
 - ★ Prepare a text – preliminary or advanced – for the three sections. It is likely that the Conclusions will advance more readily than the Introduction. For the latter, feedback and perhaps some direct writing from your Thesis Advisor or Coworker(s) will be beneficial (or needed).

✓Checkpoint No. 6

6 By now, you have gained enough experience and, by comparing to the previous checkpoints, you know what to do in your discussions.

6.1 The main body of the text has to be checked over (perhaps a final time).

6.2 Verify with your Thesis Advisor the progress on Conclusions, Introduction and Abstract. Iterate the writing and the discussions as needed, to converge towards a finalized text also for these parts.

At this point, you are in good shape for completing the paper, as you have gone through most of the organizational steps and hurdles. As a repeat of what previously stated: the proposed scheme is meant as a suggestion on how to organize the writing. You will obtain best results by comparing with other schemes (which certainly exist online) and by extracting from it something that is most suited to you and to your collaborators.

Practice is the answer to all challenges. There is no *teaching* that can replace that. In fact, “to teach” is a verb that ought to be banned from everyone’s vocabulary (not only non-English speakers). Even though “teaching” is half of my job, I think that this is a poor description of the task – *learning* is the only true activity and this can be achieved only through practice. What “teachers” can do is only support the learning process by showing known techniques, guiding the learner (and we are all learners, especially in research) and offering some advice; however, knowing full well that what is excellent help for one person may be absolutely useless for another. Thus, I hope that you will treat this advice for what it is, and take charge of your learning process in writing your papers.

Step 7: Final checks and submission

- The writing is practically completed and it is time for the last checks (including misspellings, typos, etc.).
 - ★ Plan for your final reading, checking with the Journal's guidelines on all the technical points (figures, formatting, etc.) to make sure that the paper is ready for submission. Your Thesis Advisor may (correctly) delegate to you this step and you need to ensure that everything is in order to avoid unnecessary and annoying delays coming from the non-respect of basic rules.
 - ★ Verify that all the material is ready for the submission. This step requires matching the list of what you have available with the Journal's guidelines

✓Checkpoint No. 7

- 7.1 After a final, global check, verify with your Thesis Advisor and your Co-Authors the last version of the paper. Everyone has to agree to the submission of the manuscript in the now agreed final form, thus you need to send the last version by email, explicitly asking for last-minute changes or for approval. If changes are made, then the step has to be re-iterated. For the record, this step is often done in writing (email), since the submitting Co-Author certifies all Authors' agreement.
- 7.2 One Author is chosen to be in charge of the submission with the Journal. Her/his duties reside in: 1. uploading the manuscript onto the Journal's website (nowadays this is typically done in electronic form); 2. keeping in touch with the Journal; 3. answering Journal's questions in relation to the submission; 4. serving as communication channel between Journal and all the Authors (thus, all information has to be circulated as soon as it arrives).
- 7.3 Of course, as part of the previous point the Referee reports – which come to the submitting Author – have to be immediately circulated to all Co-Authors. Typically, the submitting Author also coordinates the preparation of the Authors' answer and of the possible modifications of the manuscript for resubmission. The follow-up work (new submission with all the needed material) is part of the submitting Author's duties.

You may be chosen as the Co-Author in charge of the submission.

If you have been designated as the Author in charge of the submission to the Journal, you need to make sure that you are in possession of all of the following material before you endeavour to accomplish the task. Notice that some of the following points may need to be checked by your Thesis Advisor because of the nature of the required information. This may take some time, thus you ought to plan for that.

You should also expect, and be prepared for the possibility of having to suspend the submission process (hopefully saving the part of the work you have already done) to double check for information or parts of text that may be required by the web page (cf. below for examples). Each Journal has its own peculiar requirements, thus it is impossible to provide an exhaustive list here.

Step S: Submitting the paper on the Journal's website

- This part can be rather time consuming – more than you would expect – and requires preparation. The list below is a contribution towards being ready. However, it cannot substitute a careful reading of all the guidelines and actually going through the process, since different Journal may have different requirements. I am trying to collect the most commonly required information, presented here in an order which will not match the one of your Journal.
- S.1 Make sure that you have a submission letter addressed to the Editor, answering all the required points (to be checked on the guidelines). This letter has to be double-checked with your Thesis Advisor.
 - S.2 If you are submitting online (most likely nowadays) make sure that you have access to the site: you will probably need to register for an account, in first place. In unlucky cases this may take a day or two.
 - S.3 Make sure that you have all the information asked by the web page (hard to know ahead!), which is likely to include, among others, the affiliations of all Authors and their email addresses.
 - S.4 A list of keywords – often needed also on the manuscript – is likely to be asked by the web page. At times, it has to be chosen from the Journal's database: you may have to discover the allowed keywords and check possible choices with your Thesis Advisor or a designated Co-Author. Keep in mind that these choices are not always obvious, even for experienced researchers.
 - S.5 It is not uncommon for the web page to ask you to specify funding sources and to seek their identification online. This is at times a sticky step which results in considerable time waste, since you may have to work around ways of identifying the relevant match.
 - S.6 It is common for Journals to ask the Authors to suggest names of Referees – typically at least 3. The Journal will not necessarily contact them, but will use the suggestions to look through their database to more easily identify suitable experts. It is therefore important to make very judicious choices on this point and you absolutely need the input of your Thesis Advisor and experienced Colleagues. On the other hand, the Authors may choose not to suggest Referees (allowed).
 - S.7 It is also customary for the Journal to allow the Authors to reject some potential Referees because of conflict of interest (or any other reason – justifications are not normally required). Again, you need to check with your Thesis Advisor and Co-Authors whether some name should be put on this list.
 - S.8 One of the Co-Authors has to be designated as Corresponding Author, i.e., the Author who will receive correspondence, requests for information, questions, etc. Make sure you have cleared with your Thesis Advisor who the Corresponding Author is going to be before embarking on the submission.
 - S.9 If the paper is in Letter format (or in any case has length restrictions) it is common for the web page to run some check to verify its potential length in print. This is sometimes a sticky point because your estimates may not match those of the web page and you may need to go back to your Co-Authors to discuss trimming the text a bit.

Step 6: Submitting the paper on the Journal's website – continued

- S.10 Make sure that you have checked beforehand what is required by the Journal at submission. At times, one single file with the complete paper is to be uploaded. This is the case in which the Journal wants to simplify procedures until the Reviewers recommend publication. Additional information (e.g., high quality figures) will be requested only once a positive recommendation for publication is received. In other cases, you will have to upload from the start the individual figures in the suitable format (to be checked in the Journal's guidelines).
- S.11 Make sure you have the Supplementary Material file, animations, movies, etc. ready at hand for submission.
- S.12 A statement on the paper's relevance and novelty may be required, often asking for a justification for the Journal's choice. There is typically a limited number of words allowed for this section, which has to be filled into an online box as "text only". Some submissions sites do not ask for this piece of information.