4. Introduction

- What makes a good introduction ?

Introduction

- Your introduction is like an **opening**
- The tone and the style are important. If too dull, then the reader may well skip the article

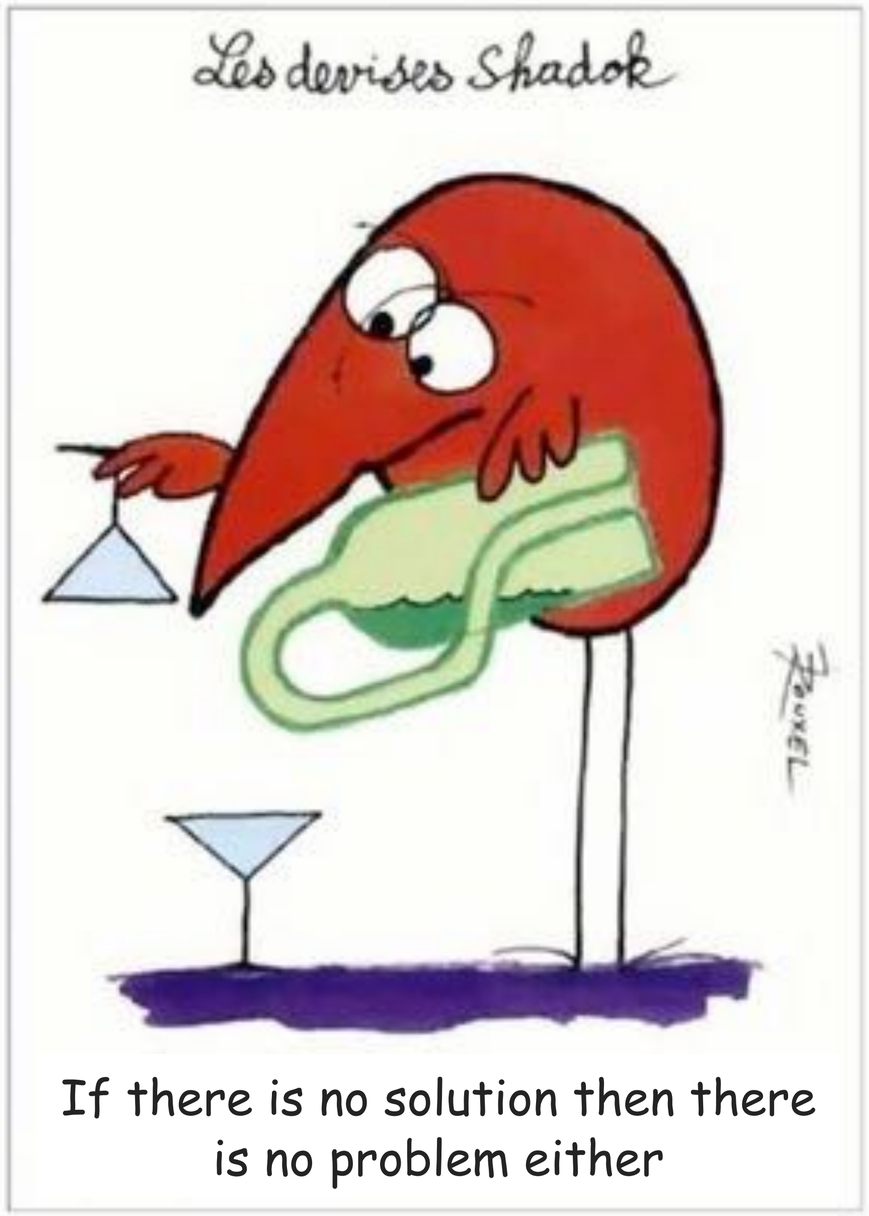
Introduction: main points

- Start with the **big picture** and progressively narrow down the scope to your topic
- Explain the state of the art and why **your** contribution matters
- End by clearly stating **what problem you will be addressing**

Gradually help the reader go from the big picture to your specific problem

Introduction

Very IMPORTANT:
Say explicitly what problem/issue you will be addressing



Properly cite the literature

- Take time to go through the literature and check who already addressed your problem…

  Many authors ignore (intentionally or unintentionally) what others have written before on the same topic.

- **Ethical conduct**
  - Properly acknowledge what others have done before you
  - Give them credit in a fair way : do NOT only cite team members or close friends.

Questions

- Are you allowed to use AI to
  - Write parts of your introduction ?
  - To determine what the main results in the field are ?
  - To do a literature search ?

Questions

- Are you allowed to use AI to
  - Write parts of your introduction ? **NEVER !**
  - To determine what the main results in the field are ? **BE VERY CAREFUL**
  - **To** do a literature search ? **BE VERY CAREFUL**

5. Method

Method

- **Method** = how did I proceed ?
  - what data ?
  - experimental protocol
  - data processing and management
  - working hypotheses (be explicit)

- **Traceability** : other people must be able to replicate your study

- **FAIR** : Findable, Accessible, Interoperable, Reusable

Method

Example: the discovery of cold fusion was a major breakthrough

But no one was able to replicate the work of the discoverers...

6. Results

Results

- Present all your results **clearly**
- Highlight what is **novel, unusual, surprising**…
- If there are many results : don’t try to interpret them in too much detail before you have provided the global picture

No cherry picking

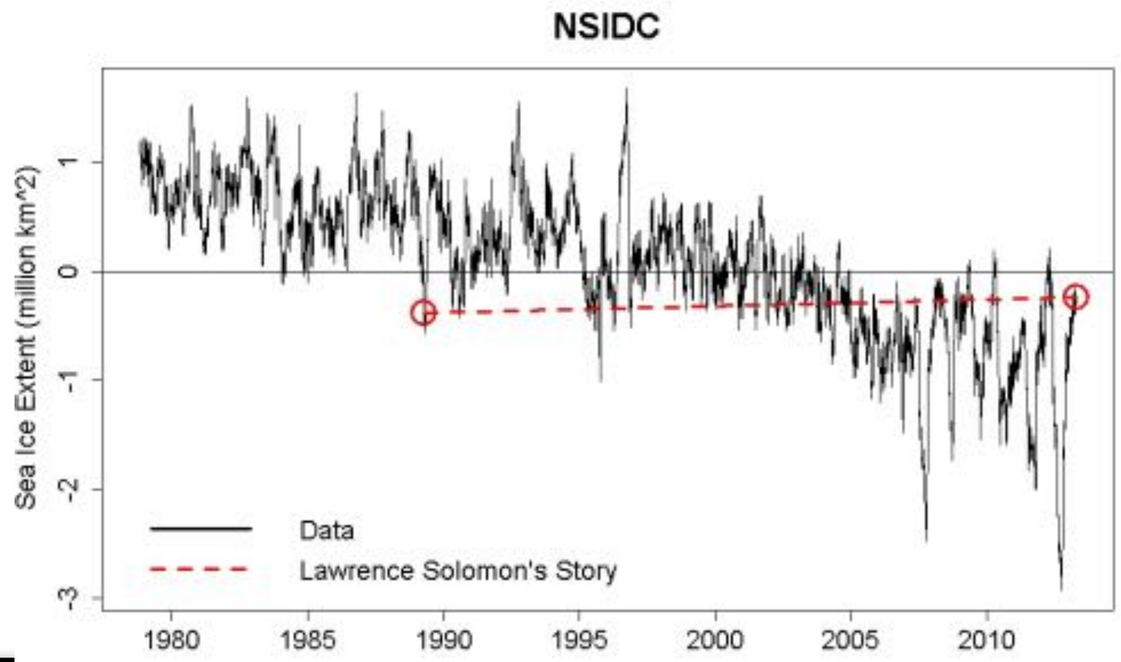
No cherry picking : discuss what works and what does NOT work (or remains unexplained)

Leite's Culinaria

No cherry picking

Cherry picking, suppressing evidence, or the fallacy of incomplete evidence is the act of pointing to individual cases or data that seem to confirm a particular position while ignoring a significant portion of related and similar cases or data that may contradict that position. Cherry picking may be committed intentionally or unintentionally. This fallacy is a major problem in public debate.

[Wikipedia, 2021]



Lawrence Solomon (2019)

Results

- **Question** : If a study leads to **negative** or **null** results (e.g. the expected effet was not observed), should I nevertheless publish that ?

> *"Scientific findings are like an iceberg, it floats with around 10% of published discovery above 90% of negative results."*

See for example the International Journal of Negative Results

Understanding failure is vital and yet very few people publish their negative results…

7. Discussion

Discussion

- The discussion is the core of your study
- This is where **you** will provide your added value

Highlight what is YOUR original contribution to the issue

Discussion

- Sell your results: highlight what is new
- But do not oversell : be careful with “best”, “first”, “novel”, “first ever”, “new paradigm”, …
- Put your results in context: compare with others, be honest, discuss what does NOT work

Golden rule : Say what you mean, and mean what you say

Discussion

Tell a story : good articles are often structured like a story, with a buildup of tension, followed by an unwinding

8. Conclusion

Conclusion

- Conclusion ≠ abstract !
- Conclusion =
  - **Synthesis** of the results
  - Emphasise what **progress** has been made
  - Highlight the **impacts**, the larger implications
  - If relevant, discuss **perspectives** and new ways of elaborating on this problem

Conclusion

- Many readers will jump directly from the abstract to the conclusions.
- The reader is not supposed to have to read the article in order to understand the conclusions.

What are the main parts in this conclusion ?

Control is a central issue in most complex systems, but because a general theory to explore it in a quantitative fashion has been lacking, little is known about how we can control a weighted, directed network—the configuration most often encountered in real systems. Indeed, applying Kalman's controllability rank condition (equation (3)) to large networks is computationally prohibitive, limiting previous work to a few dozen nodes at most. Here we have developed the tools to address controllability for arbitrary network topologies and sizes. Our key finding, that N_D is determined mainly by the degree distribution, allows us to use the tools of statistical physics to predict N_D from $P(k_{in}, k_{out})$ analytically, offering a general formalism with which to explore the impact of network topology on controllability.

The framework presented here raises a number of questions, answers to which could further deepen our understanding of control in complex environments. For example, although our analytical work focused on uncorrelated networks, the algorithmic method we developed can identify N_D for arbitrary networks, providing a framework in which to address the role of correlations systematically. Taken together, our results indicate that many aspects of controllability can be explored exactly and analytically for arbitrary networks if we combine the tools of network science and control theory, opening new avenues to deepening our understanding of complex systems.

Conclusion : to avoid

- Avoid rhetoric and personal statements

  “In the end, this study was enriching because it allowed me to discover a laboratory, and also learn how a high-resolution mass spectrometer works."

- Avoid jargon that can be understood only by reading the full article

  “The ZX232 protocol, which we have introduced the MVA method for DBAs, outperforms the older ZH127 protocol for extracting...”

Alternative formats

- Conclusions with bullets offers extra conciseness and clarity

To summarise, our study reveals that:

- *The intrinsic properties of ****
- *No substitute has be found for ****
- *An enhancement of *****

Together, these results suggest that ….

Take home message

- Not all conclusions need to be structured : e.g. Nature

Check for updates

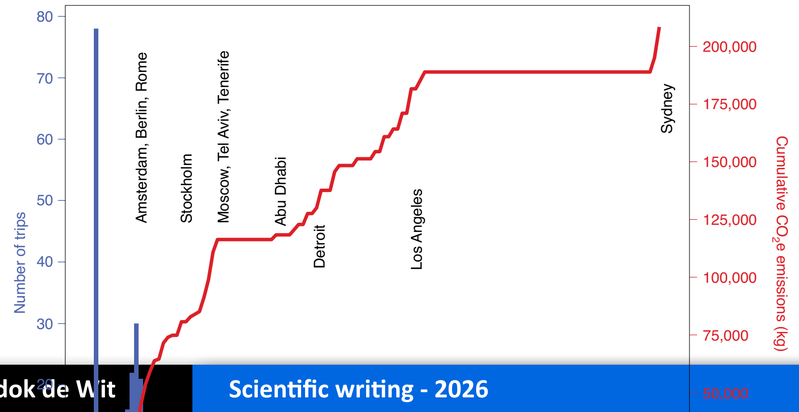
comment

The carbon footprint of large astronomy meetings

The annual meeting of the European Astronomical Society took place in Lyon, France, in 2019, but in 2020 it was held online only due the COVID-19 pandemic. The carbon footprint of the virtual meeting was roughly 3,000 times smaller than the face-to-face one, providing encouragement for more ecologically minded conferencing.

Leonard Burtscher, Didier Barret, Abhijeet P. Borkar, Victoria Grinberg, Knud Jahnke, Sarah Kendrew, Gina Maffey and Mark J. McCaughrean

The scientific evidence that we live in a climate emergency calls for urgent action[1]. As a society, we are collectively failing to live within our environmental boundaries[2], with possibly catastrophic consequences for human civilization[1]. The time to address these issues is now[1,3]. The United Nations Emissions Gap Report from 2019 states that each year a global reduction of emissions of 7.6% is required to limit the average global temperature rise to 1.5 °C (ref. [3]) — the target that was outlined in the Paris Agreement in 2016. At the current rate of emissions, we will exceed the 'carbon budget'



Take home message

emissions of joining EAS 2020 compared to working in the home office.

The future of conferencing

We conclude that the internet-related emissions of EAS 2020 were negligible compared to the travel-related emissions alone of EWASS 2019. This finding is in common with other recent estimates for large international conferences, for example, a virtual annual meeting of the American Geophysical Union (AGU) was calculated to emit less than 0.1% of the travel emissions of the face-to-face AGU 2019 meeting[16].

One approach to cut emissions while retaining scientific and social connections globally is to 'attach' smaller satellite meetings to the large annual meetings of the respective regional astronomical societies. For example, the weeks before and after the (Northern Hemisphere) winter American Astronomical Society and (Northern Hemisphere) summer EAS meetings could be used for smaller meetings that are held in the vicinity, requiring minimal extra travel emissions to join them. A meeting schedule could be coordinated globally by the International Astronomical Union.

fall thanks to an increasing fleet of night trains across Europe at least and, in the future, short flights that can be powered by synthesized fuel or batteries. Such a scheme of regional hubs has been tried and evaluated as successful by various groups in the last year[17,18].

Lastly, we also see a possibility to move to an entirely online meeting format without any (large) physical meetings in the future. Such meetings could be held in the 'nearly carbon neutral conferencing' format[19], that is, essentially with pre-recorded talks and live discussion sessions, to minimize the time where everyone needs to be online simultaneously, and therefore allow global collaboration across many time-zones.

The emerging picture is that there is a real opportunity for future meetings to adopt practices that provide a range of attendance possibilities for participants, which promote a more sustainable, accessible and diverse meeting concept for the growing international community. While discussions are ongoing regarding the future of meetings, we expect that the post-COVID-19 future will hold a mix of purely virtual conferences, next to hybrid meetings where some participants join in person and others use a

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Acknowledgements

L.B. would like to acknow on a draft article from M L. Kaper, S. Lucatello, S. A. Schouten-Voskamp.

Competing interests

L.B. was a member of the EAS 2020 meeting. M.J.M organizing committee of remaining authors declar

One last thing…

- Good conclusions mirror the **question** that was asked in the introduction and clearly show what progress has been made
  - Where did we start from ?
  - What did we achieve ?
  - What should the next steps be ?

Take home message

- Highlight your **take home message**

If the reader had to remember one single sentence, what should it be ?

YOU should decide what matters rather than let the reader guess it

Take home message: example

Control is a central issue in most complex systems, but because a general theory to explore it in a quantitative fashion has been lacking, little is known about how we can control a weighted, directed network—the configuration most often encountered in real systems. Indeed, applying Kalman's controllability rank condition (equation (3)) to large networks is computationally prohibitive, limiting previous work to a few dozen nodes at most. Here we have developed the tools to address controllability for arbitrary network topologies and sizes. Our key finding, that N_D is determined mainly by the degree distribution, allows us to use the tools of statistical physics to predict N_D from $P(k_{in}, k_{out})$ analytically, offering a general formalism with which to explore the impact of network topology on controllability. The framework presented here raises a number of questions, answers to which could further deepen our understanding of control in complex environments. For example, although our analytical work focused on uncorrelated networks, the algorithmic method we developed can identify N_D for arbitrary networks, providing a framework in which to address the role of correlations systematically**. Taken together, our results indicate that many aspects of controllability can be explored exactly and analytically for arbitrary networks if we combine the tools of network science and control theory, opening new avenues to deepening our understanding of complex systems.**

9. Acknowledgements

Acknowledgements

- Thank the people who
  - Contributed in some way to the study
  - Who commented on the manuscript
  - The referees (if they were helpful)
  - Provided the free software (e.g. python modules)
  - And always thank your **funding agencies** (mandatory !)
- Be very factual.
  - Avoid : *“and I thank Lizz and Jim for making coffee…”*
- Mention people explicitly when known

Acknowledgements

Failing to acknowledge your sponsors or funding agencies may cause your funding to be suspended.

This is critical for EU-funded projects.

Acknowledgements

- Check what are the rules for thanking your funding agency
- Example:

  "P. M. and M. K. gratefully acknowledge the International Space Science Institute (ISSI, Bern) for hospitality. This study received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under the grant agreement number 218816 (SOTERIA project) and from the Programme National Soleil-Terre (PNST). We also thank Thomas Benseghir and Nolwenn Marchand for their assistance in the data analysis. The AIA data are courtesy of SDO (NASA) and the AIA consortium."

10. Table of Contents

- When is a table of contents needed / useful ?

Table of Contents

- TOCs are not required, except for long reviews and theses
- **Tip**: build the table of contents even if not needed and check whether the titles/subtitles are consistent

  This is easy with LaTeX : just add `\tableofcontents`

What problems do you spot in this Table of contents ?

11. Supplementary material

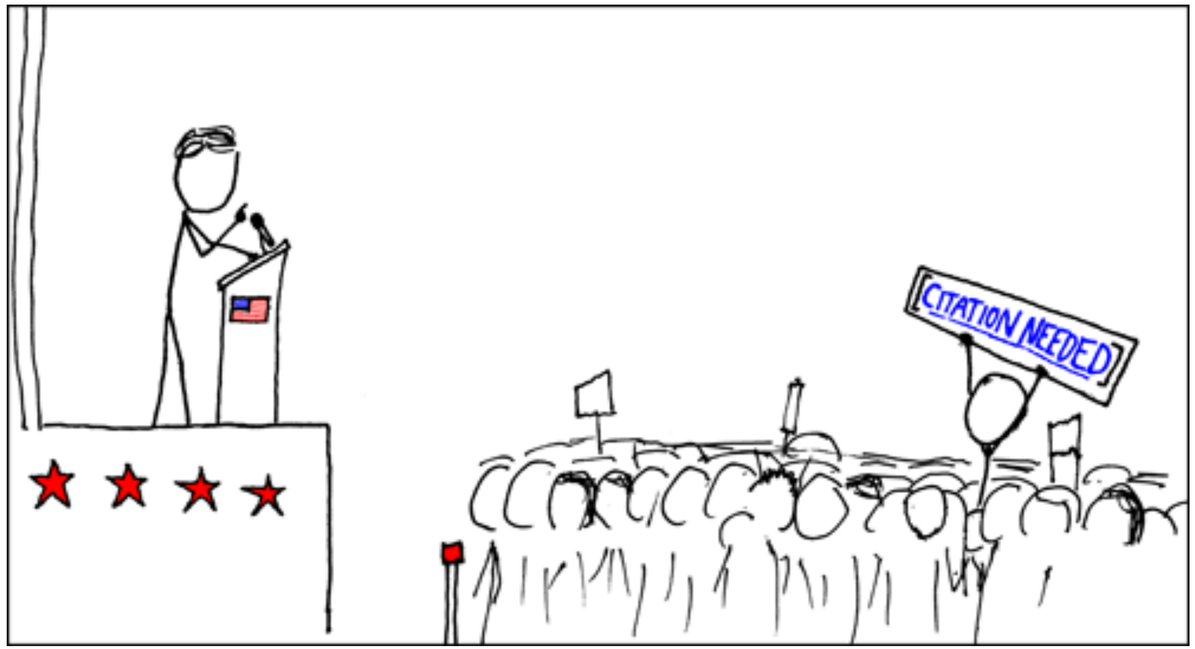
Supplementary material

- Supplementary material = everything that may be useful to some but would distract the reader from the main message if put in the core of the article
- Use with moderation

References

References

- Your sources of information must be cited
- …but these citations must be reliable
  - Perennial
  - Easy to find



https://xkcd.com/285/

What is eligible for a citation in a scientific article ?

book with ISBN	always
book without ISBN	no
website with date of last visit	usually not
website	no
abstract submitted to a conference	no, unless in specific cases, when published in a book
peer-reviewed article, not in English	only if necessary
article in mainstream newspaper	no (there are exceptions in humanities)
proceedings of a conference (published)	no, unless in specific cases, when published in a book
technical report	if necessary
PhD thesis	if necessary
submitted (but not yet accepted) article	no, use instead (Name, personal communication)
article in preparation (not yet submitted)	never
preprint in archive (e.g. ArXiV)	some journals accept preprints

How to cite ?

- Each journal has its own rules
- Examples
  - Recent studies [2] and...
  - Recent studies [MacKay et al., 2018] and...
  - Recent studies (MacKay et al., 2018) and...
  - Recent studies by MacKay et al. (2018), and…
- See for example the Chicago Manual of Style : https://www.chicagomanualofstyle.org/home.html

Degtyarev, V. I., Kharchenko, I. P., Potapov, A. S., Tsegmed, B., and Chudnenko, S. E.: Qualitative estimation of magnetic storm efficiency in producing relativistic electron flux in the Earth's outer radiation belt using geomagnetic pulsations data, Adv. Space Res., V. 43 (5), 829–836, doi:10.1016/j.asr.2008.07.004, 2009.

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How to cite ?

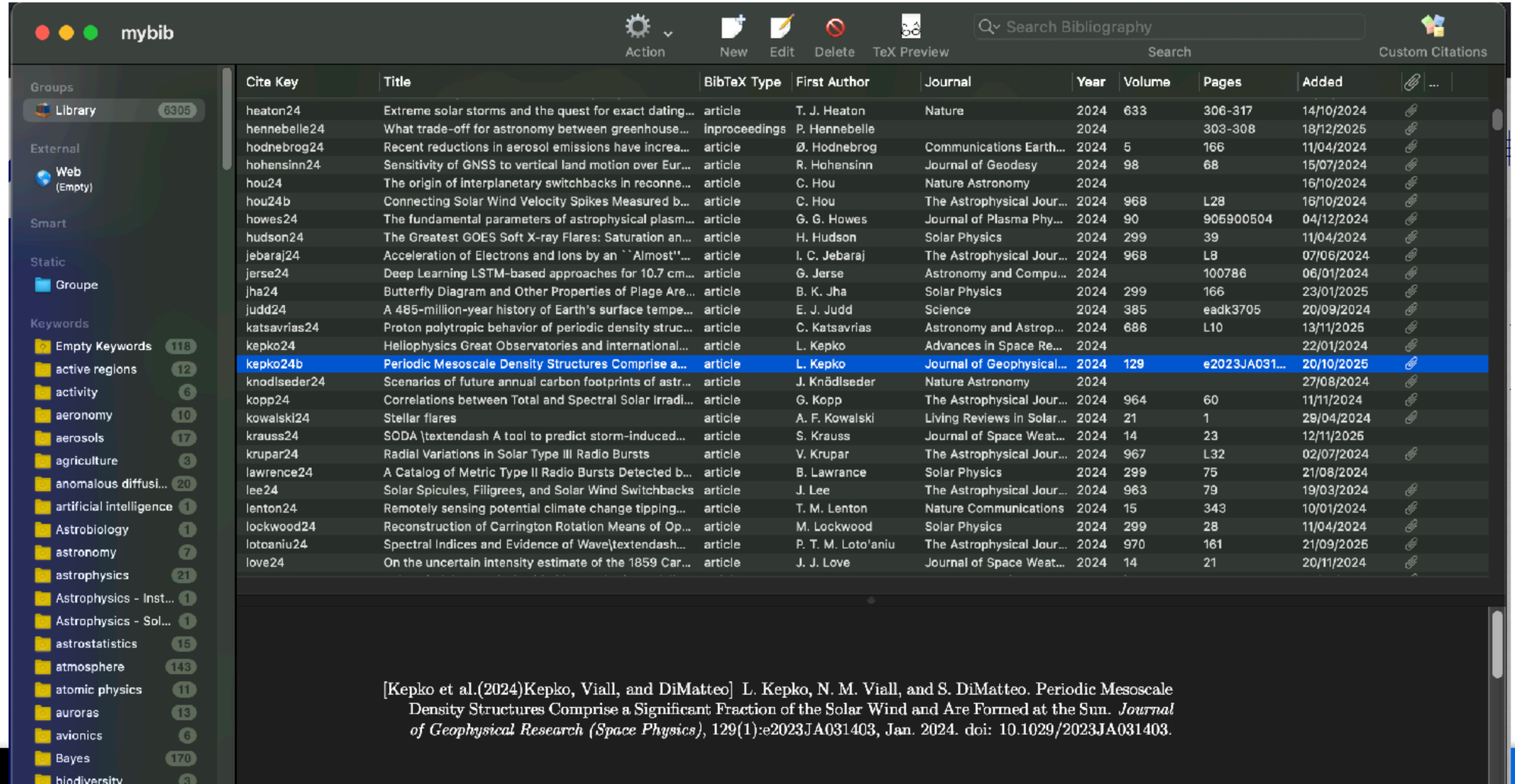
- Lists of references are often full of errors

  “Sloppy citations = sloppy writing = sloppy work”

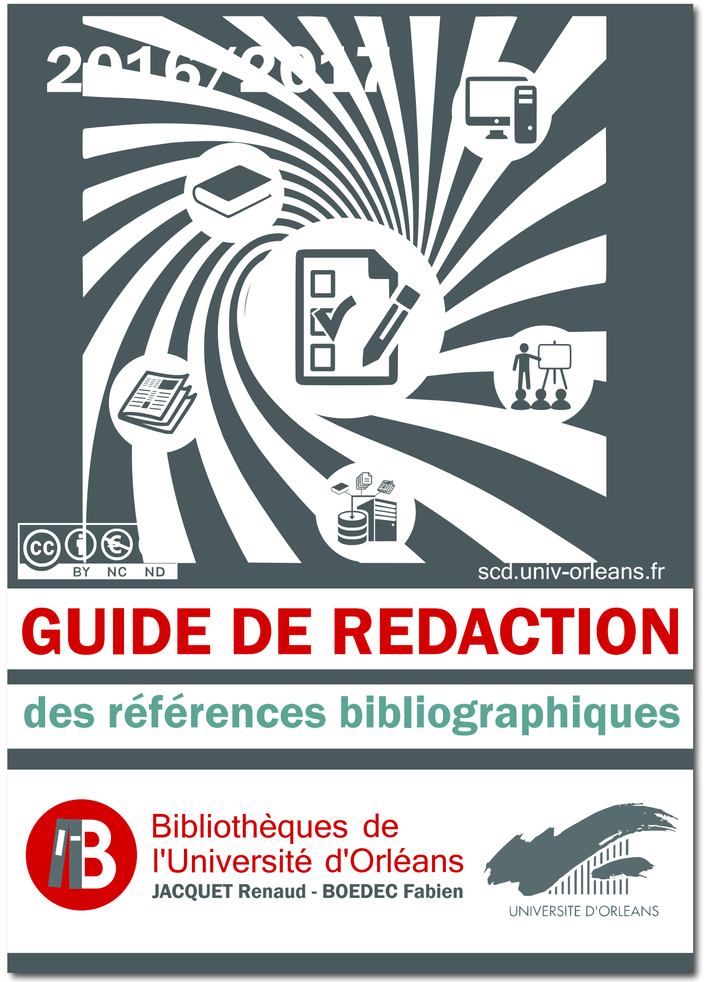
Use as much as possible automated tools for collecting (ZOTERO...) and displaying (BiBTeX...) references. But even these are not devoid of errors

How to cite ?

- There are excellent tools around (EndNote, JabRef, Mendeley, BiBDesk…) for collecting and handling references



How to cite ?



Available on Celene and on https://scd.univ-orleans.fr/sites/default/files/contributeurs/guide-biblio-orle.pdf

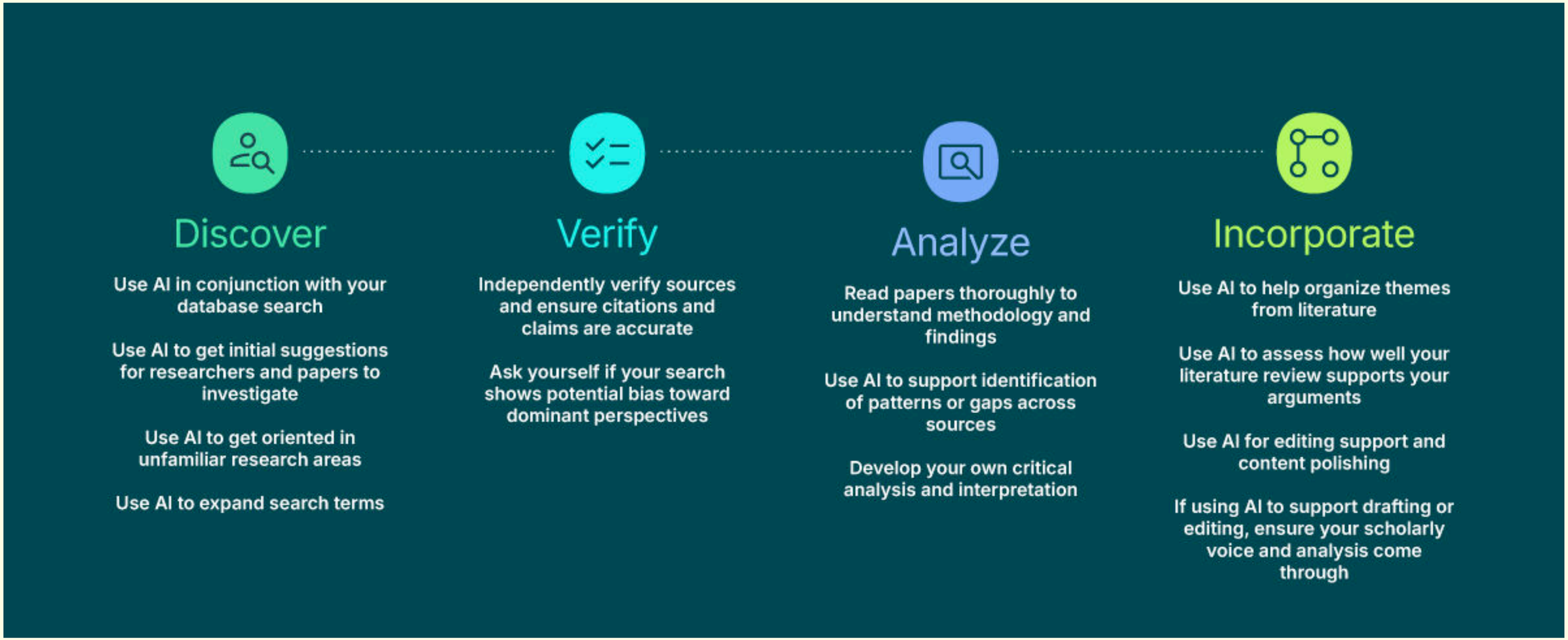
AI

- Can I use AI for a literature search ?

AI

Use AI only as an (incompetent) guide, NEVER as a substitute

Wiley (2026)



Ensuring the quality of your literature survey

- Read relevant primary sources yourself rather than relying solely on AI summarie
- Use AI to support rather than replace your critical thinking
- Ensure all citations directly support the specific claims you're making in your manuscript
- Verify that every citation corresponds to an actual, accessible publication
- Confirm that cited sources make the arguments you attribute to them

from : https://www.wiley.com/en-us/publish/article/ai-guidelines/#litreview