Scientific Writing

Thierry Dudok de Wit
Laboratoire de Physique et Chimie de l'Environnement et de l'Espace &
International Space Science Institute

Why this course ?

In 2025

>46'000 journals worldwide

>5'000'000 articles published

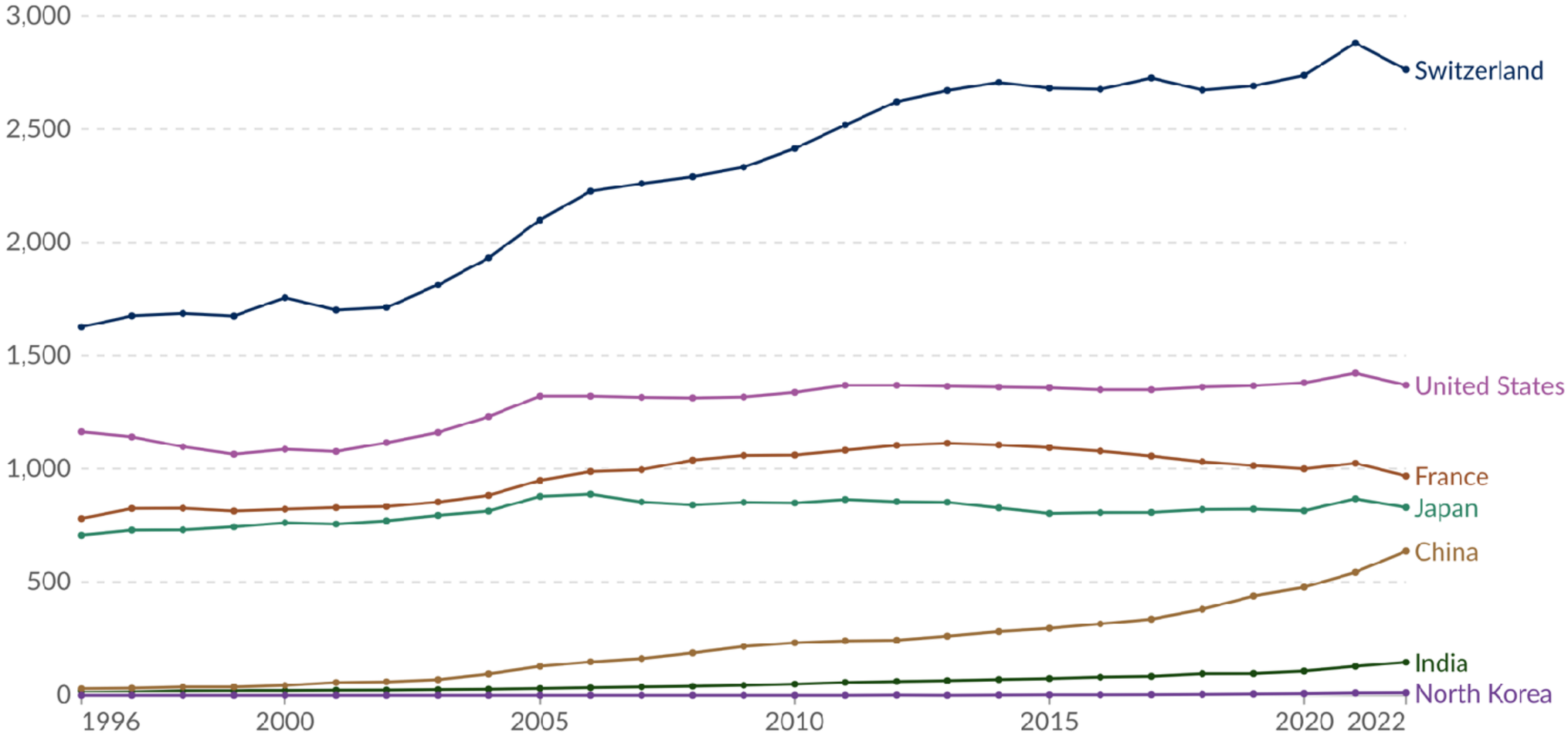
this number increases by 8%/year

wordsrated.com ncses.nsf.gov

Annual articles published in scientific and technical journals per million people, 1996 to 2022

Our World in Data

Includes physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences.



Data source: National Science Foundation Science and Engineering Indicators, via World Bank (2025); United Nations Population Division, national statistical offices, and Eurostat, via World Bank (2025)

Note: Articles are assigned based on the country of the first author's institution.

Why this course ?

- You will be increasingly often **evaluated**
- The number & quality of your publications is a major evaluation criterion for your academic career (whether you like it or not)

> "Good publication is not just a matter of life and death, it is much more serious than that."
>
> Robert Day

- How many articles should you publish during your thesis ?
- How many as a first author ?
- How many articles per year are you supposed to publish as a senior researcher ?

The pillars of science : what we take for granted

What characterises scientific publications as opposed to other types of publications (journals, novels, poetry, etc) ?

The pillars of science : what we take for granted

- **Independence** and **freedom** of research
  (at least, in our academic world)
- **Open** communication: conferences, seminars, publications, …
- **Peer** review (refereeing) with critical evaluation.
- **Repeatability** of work and compatibility with other results.

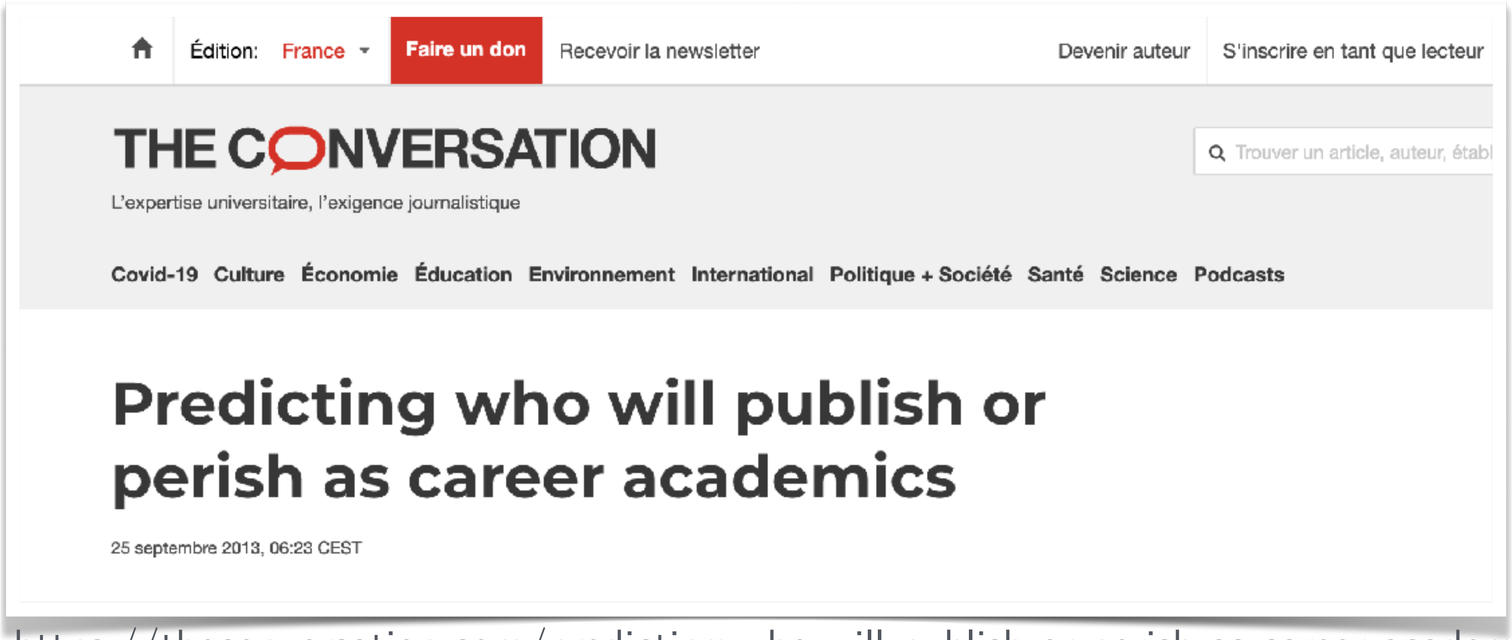
after S. Solanki (2011)

The dress code behind publishing

- Your publications can be properly read/understood only if you conform to a common writing style.

- The whole system (peer review, dissemination, …) relies on **mutual trust.**

How about you ?



https://theconversation.com/predicting-who-will-publish-or-perish-as-career-academics-18473

- Start publishing as soon as possible !
- Especially if you're a woman and if English is not your native language

Syllabus of this course

Organisation

- Three instructors
  - Jean-Louis Rouet (ISTO/UFR Sciences) —> likely to be replaced
    jean-louis.rouet@univ-orleans.fr
  - Pascale SOLON (SCD, Bibliothèque Univ.)
    pascale.solon@univ-orleans.fr,
  - Thierry Dudok de Wit (LPC2E/OSUC & ISSI)
    ddwit@cnrs-orleans.fr
- Language : English

Contents

- Writing a good scientific document (T. Dudok de Wit)
- Different types of documents (T. Dudok de Wit)
- Documentary research and how to organise references (P. Solon)
- Open science, ethical aspects (P. Solon)
- Basics of LaTeX : Styles and typography (J.-L. Rouet)
- The submission and revision process (T. Dudok de Wit)

To validate this course

Validation this course requires to:

- Attend the course (attendance sheet)
- Submit a **short article** (3-6 pages) by mid-May
  - follow rules of scientific publishing
  - LaTeX preferable but not mandatory
- Submit a **peer review** by the end of May
  - review the article of one of your colleagues
  - anonymous

What we will NOT address

- Oral communication (giving a talk)
- Posters
- Specifics of publishing in social sciences, medicine, etc.

Useful documents

- All relevant documents are on CELENE

  https://celene.univ-orleans.fr/course/view.php?id=2338

Notation

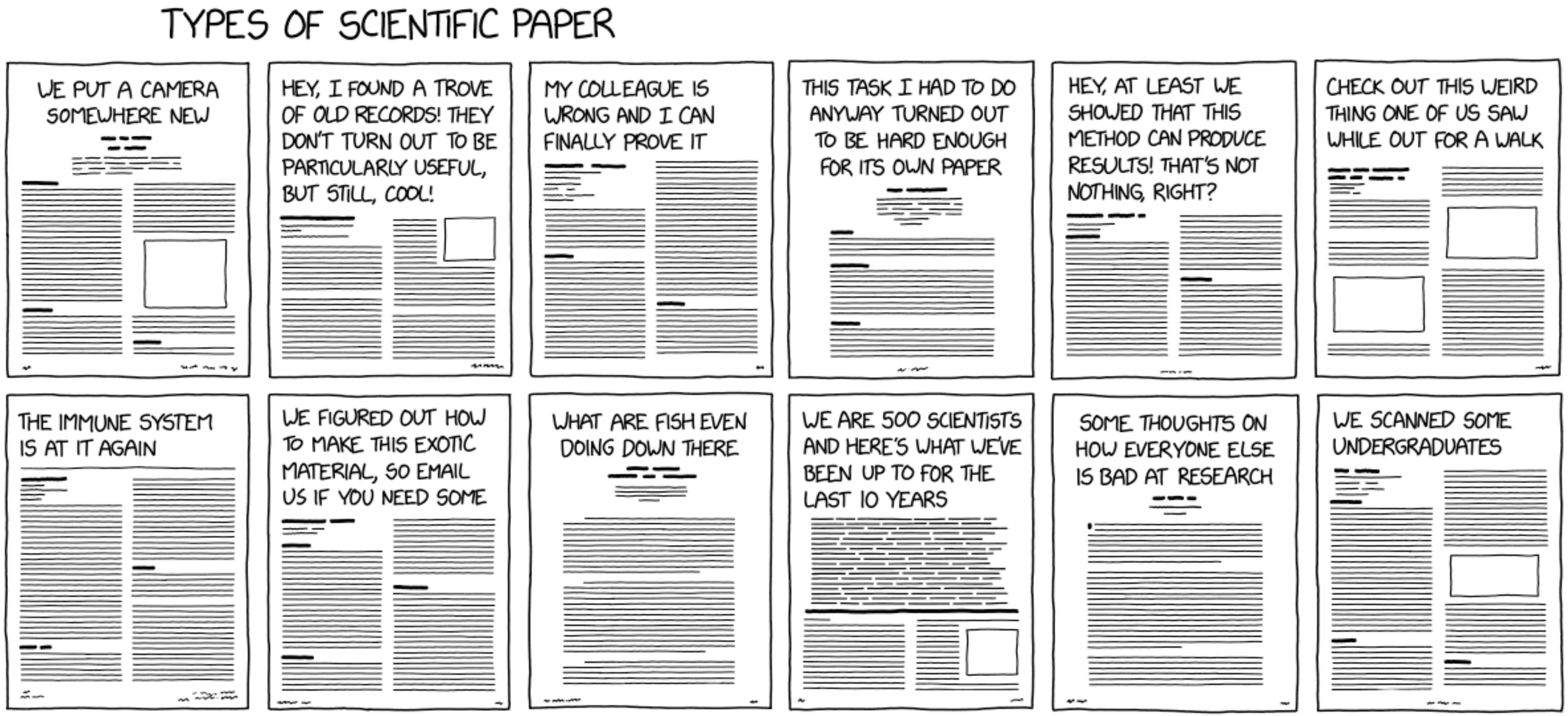
Whenever you see such a box

$=$ take home message

Setting your priorities

Quizz : why should I publish ?

Likewise there are many types of papers



xkcd.com

Three key questions

- **Audience** : who am I writing for ?
- **Message** : what do I want to communicate ?
- **Objective** : why should I communicate on this ?

Levels of perception

Levels of perception

Although consistently active, every few thousand years, Mount Vesuvius erupts in spectacular style with stunning fireworks. The last time it did so, in ad 79, it consumed the city of Pompeii in the flames. To protect the observatory, it was decided to build it far enough from the summit to be safe from ejected debris and high enough on a knoll to avoid the lava flows.

- What different styles can you detect ?

3 levels of communication

1. Conceptual

- ideas, reasoning, analysis, ...
- conveys the reasoning
- *e.g. I understand what you mean*

2. Factual

- facts, feelings, ...
- tells about your role
- *e.g. I measured these quantities...*

3. Emotional

- feelings, belief, emotions, ...
- allows you to share your feelings
- *e.g. I'm impressed by the way you...*

3 levels of communication

- These 3 levels correspond to our 3 entities of perception
  - **spirit** (conceptual, rational) = I **understand** what you write
  - **body** (factual, sensitivity) = I **gather the facts** you mention
  - **heart** (emotional, feelings) = I **adhere** to what you say

All three levels are needed
to communicate properly

Levels of communication

- What is the proper balance for a scientific article ?

Factual	xx %
Conceptual	xx %
Emotional	xx %

3 levels of communication






Scientific communication should be factual and objective but not devoid of emotion

What is the main level of ... ?

- As a consequence, we had to eliminate part of the sample...
- By lowering the combustion temperature we found...
- Many have wondered before why this occurs so often...
- Note in particular the unusual strength of...
- According to this result, we cannot distinguish...
- This inspiring study led to a remarkable result...
- This result comes as a surprise, because of the large...

Avoid

- **Jargon** :
  “atmospheric deposition of anthropogenically-derived acid substances
- **Euphemism** :
  “The rat lost its integrity”
- **Inflated language** :
  “a three-dimensional biopolymer composite”

These are all true examples

Avoid stale language (“langue de bois”)

Le comité propose de considérer cet objectif comme un enjeu majeur et de l’arrimer à des outils clairement établis dans les règles du nouveau programme pour en garantir une opérationnalisation effective.

Language course at the former ENA

Neutrality

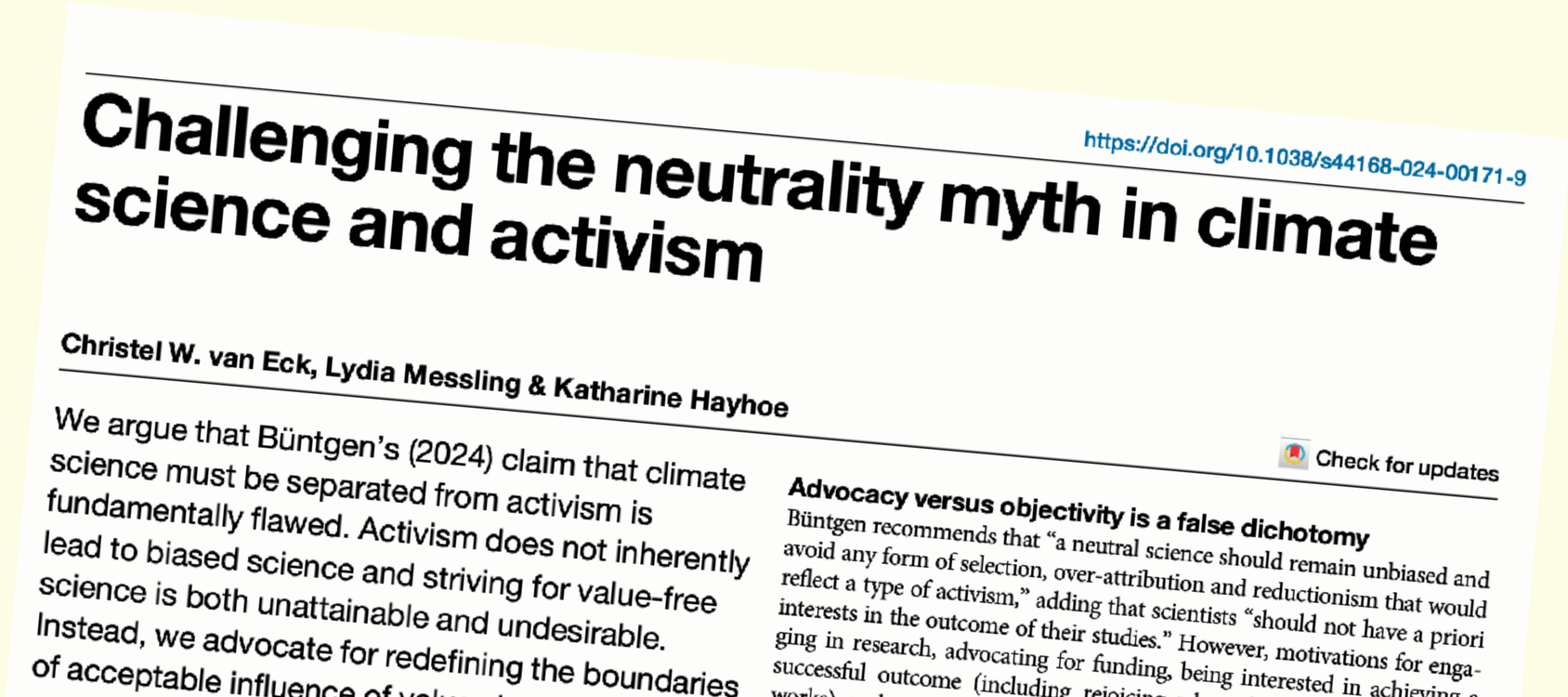
- Should/can scientific articles be both **neutral** and **objective** ?

Neutrality

- Should/can scientific articles be both **neutral** and **objective** ?

  Objective ? always

  Neutral ? not necessarily



https://doi.org/10.1038/s44168-024-00171-9

Challenging the neutrality myth in climate science and activism

Christel W. van Eck, Lydia Messling & Katharine Hayhoe

We argue that Büntgen's (2024) claim that climate science must be separated from activism is fundamentally flawed. Activism does not inherently lead to biased science and striving for value-free science is both unattainable and undesirable. Instead, we advocate for redefining the boundaries of acceptable influence of

Advocacy versus objectivity is a false dichotomy

Büntgen recommends that "a neutral science should remain unbiased and avoid any form of selection, over-attribution and reductionism that would reflect a type of activism," adding that scientists "should not have a priori interests in the outcome of their studies." However, motivations for engaging in research, advocating for funding, being interested in achieving a successful outcome (including rejoicing

Canonical structure of an article

What are the key sections of an article ?

Canonical structure

- Title
- Author(s)
- Summary / Abstract
- Plain language summary
- Keywords
- Introduction
- Methods
- Results
- Discussion
- Conclusion
- Acknowledgements
- References

Canonical structure

- Title
- Author(s)
- Abstract
- Keywords

Front matter

- Introduction
- Methods
- Results
- Discussion
- Conclusion

Main body (IMRAD)

- Acknowledgements
- References
- Supplementary material

Ending

Canonical structure

- Title
- Author(s)
- Abstract
- Keywords
- Introduction
- Methods
- Results
- Discussion
- Conclusion
- Acknowledgements
- References
- Supplementary material

Introduction
Methods
Results
and
Discussion

$=$ IMRAD

Canonical structure

- The IMRAD structure is **universal**
- Readers can therefore locate immediately what they are looking for = they know how to find their way

If you do not follow this plan
your communication will not be efficient

1. Title

Titles

- Title = first (and often only) contact with your audience

Your title must inform the person and encourage him/her to read your article

A good title is…

- concise (ideally < 15 words) and immediate to understand
- catchy and engaging to spark interest
- sells the main outcome rather than the method
- specific: it tells right away what this work is about
- accurate: tells exactly what the study is about
- matches the editorial policy of the journal
- avoids acronyms and jargon
- does not have to be a sentence, but must be syntaxically correct

Titles can be…

- **Descriptive** : *Climate Change and Its Impact on Global Biodiversity: A Meta-Analysis of the Last Decade*
- **Methodology-focused**: *Using Machine Learning to Predict the Transit Time of Solar Wind Disturbances*
- **Question-based** : *Can Artificial Intelligence Improve Early Detection of Parkinson's Disease?*
- **Hypothesis-driven**: *Urban Green Spaces Reduce Stress and Improve Mental Health: Evidence from a Longitudinal Study*
- **Scoop-like**: *First Observation of Gravitational Waves from a Neutron Star Merger*

What title would you give ?

- You are a spectroscopist who has carried out a detailed study of star clusters. You have just written an article about star formation, showing that the distribution of novel stars (protostars) in these molecular clouds does not match the standard model.

- Read the titles that come next and determine the best one – and **why** you think it is the best one.

Which title ?

1. Spectroscopic observations of the Eagle, Orion and Carina nebulae
2. Protostar distribution and the formation of massive new stars: testing the cluster-assist model
3. On the observation of protostellar masses
4. Detailed images of protostar neighbourhoods do not support the cluster-assist model of massive star formation
5. Spectroscopic mapping reveals anomalous protostar distribution: Implications for turbulent star formation theories
6. Can patterns of protostar distribution within molecular clouds distinguish between competing models of massive star formation ?

after S. B. Heard (2020)

Titles : examples

BEFORE : On the accurate estimation of scaling exponents in the observational study of scale-invariant phenomena in finite time series

AFTER : Pseudo-nonstationarity in the scaling exponents of finite-interval time series

Always avoid starting with “On the...”, “Invstigation of...” etc

Some poor titles

Regional development in eastern Uganda, 1975-95

Spatio-temporal analysis of plasma fluctuations

Magnetohydrodynamic Simulation of a Sigmoid Eruption of Active Region 11283

Was Jane Austen ever in love?

Burning down the pagoda in order to roast the pork

On the application of Exploratory Data Analysis for characterization of cryospheric data sets

Some better titles

Wavelet analysis of turbulence reveals the multifractal nature of the Richardson cascade

Pattern formation outside of equilibrium

Climate: How unusual is today's solar activity?

Will Comet ISON (C/2012 S1) Survive Perihelion?

Learning the parts of objects by non-negative matrix factorization

How about these titles ?

You Probably Think This Paper's About You: Narcissists' Perceptions of Their Personality and Reputation

Children and Mini-Magnets: An Almost Fatal Attraction.

Snakes on a spaceship - An overview of Python in Heliophysics

The mouth, the anus and the blastopore - open questions about questionable openings

No solar hiding place for greenhouse skeptics

Find a good title for this abstract

Milankovitch proposed that Earth resides in an interglacial state when its spin axis both tilts to a high obliquity and precesses to align the Northern Hemisphere summer with Earth's nearest approach to the Sun. This general concept has been elaborated into hypotheses that precession, obliquity or combinations of both could pace deglaciations during the late Pleistocene. Earlier tests have shown that obliquity paces the late Pleistocene glacial cycles, but have been inconclusive with regard to precession, whose shorter period of about 20,000 years makes phasing more sensitive to timing errors. No quantitative test has provided firm evidence for a dual effect.

Here I show that both obliquity and precession pace late Pleistocene glacial cycles. Deficiencies in time control that have long stymied efforts to establish orbital effects on deglaciation are overcome using a new statistical test that focuses on maxima in orbital forcing. The results are fully consistent with Milankovitch's proposal but also admit the possibility that long Southern Hemisphere summers contribute to deglaciation.

Titles suggested by mistral-ai

- Quantitative Evidence for Dual Control of Late Pleistocene Glacial Cycles by Obliquity and Precession
- Overcoming Time Control Limitations: A Statistical Test Confirms Milankovitch's Dual Orbital Forcing Hypothesis
- Milankovitch's Hypothesis Validated: Both Obliquity and Precession Pace Late Pleistocene Deglaciations
- Orbital Forcing Maxima Reveal Combined Obliquity and Precession Influence on Late Pleistocene Glacial Cycles
- Northern and Southern Hemisphere Summer Insolation: New Statistical Evidence for Milankovitch's Deglaciation Mechanism

Exercice

LETTER

doi:10.1038/nature10626

Combined obliquity and precession pacing of late Pleistocene deglaciations

Peter Huybers[1]

Milankovitch[1] proposed that Earth resides in an interglacial state when its spin axis both tilts to a high obliquity and precesses to align the Northern Hemisphere summer with Earth's nearest approach to the Sun. This general concept has been elaborated into hypotheses that precession[2], obliquity[3,4] or combinations of both[5–8] could pace deglaciations during the late Pleistocene[9,10]. Earlier tests have shown that obliquity paces the late Pleistocene glacial cycles[4,11] but have been inconclusive with regard to precession, whose shorter period of about 20,000 years makes phasing more

account for uncertainty in the ^{40}K decay constant[18,19], it is now represented as occurring at 780 ± 8 kyr (1 s.d.). Terminations are identified by local maxima in the time rate-of-change of the δ^{18}O record that exceed a value of 0.095‰ per kyr, giving the usual termination features[20] except that termination 3 contains two parts that are labelled 3a and 3b (Fig. 1a). (Thresholds ranging between 0.07‰ and 0.17‰ per kyr would give different numbers of terminations but give similarly significant results.) The average uncertainty in the age of the 12 identified termination features is 8 kyr (1 s.d.), with older ages

One last thing…

- A title is much more likely to attract attention if it starts with the **main findings** or consequences (rather than context or methodology)
- Search engines are more likely to find your work if the title contains **key-words**
- Examples:
  - “The Laschamp geomagnetic excursion featured in nitrate record from EPICA-Dome C ice core”
  - “Excavating Neandertal and Denisovan DNA from the genomes of Melanesian individuals”
  - “Oxidation products of biogenic emissions contribute to nucleation of atmospheric particles”

Focus your title on the main findings

2. Authors

Authors

- After the title, the names of the authors are the second most frequent item people will read

Why does the author/affiliation list matter ?

- It tells the reader who contributed to the study
- It establishes the authority of your work (affiliations, institutions, etc)
- It allows indexing your paper in databases
- It allows interested readers to contact you
- It matters for your funding agencies
- In some cases (e.g. US scientists) it may also put you in a difficult position

Who should appear as co-author ?

1. Those who wrote the text
2. Those who made the plots
3. Those who analysed the data, ran the simulations
4. Those who provided the data
5. Those who did the field work
6. Those who coordinated the field campaign
7. The engineers and technicians who contributed to the study
8. The students who worked on the data during an internship
9. Those who first gave you the idea
10. The team leader
11. The director of the laboratory
12. The person runs the project that funds you

Who are the authors ?

Authors ***must*** meet all 3 of the following criteria

1. He/she has made **substantial** contributions to the work (i.e. design of the experiment, data analysis, interpretation, etc.)

AND

2. He/she has contributed to writing the manuscript or to revising it.

AND

3. He/she has approved the final version.

Authors

Title: Review of Particle Physics

Authors: Yao, W.-M.; Amsler, C.; Asner, D.; Barnett, R. M.; Beringer, J.; Burchat, P. R.; Carone, C. D.; Caso, C.; Dahl, O.; D'Ambrosio, G.; De Gouvea, A.; Doser, M.; Eidelman, S.; Feng, J. L.; Gherghetta, T.; Goodman, M.; Grab, C.; Groom, D. E.; Gurtu, A.; Hagiwara, K.; Hayes, K. G.; Hernández-Rey, J. J.; Hikasa, K.; Jawahery, H.; Kolda, C.; Kwon, Y.; Mangano, M. L.; Manohar, A. V.; Masoni, A.; Miquel, R.; Mönig, K.; Murayama, H.; Nakamura, K.; Navas, S.; Olive, K. A.; Pape, L.; Patrignani, C.; Piepke, A.; Punzi, G.; Raffelt, G.; Smith, J. G.; Tanabashi, M.; Terning, J.; Törnqvist, N. A.;sTrippe, T. G.; Vogel, P.; Watari, T.; Wohl, C. G.; Workman, R. L.; Zyla, P. A.; Armstrong, B.; Harper, G.; Lugovsky, V. S.; Schaffner, P.; Artuso, M.; Babu, K. S.; Band, H. R.; Barberio, E.; Battaglia, M.; Bichsel, H.; Biebel, O.; Bloch, P.; Blucher, E.; Cahn, R. N.; Casper, D.; Cattai, A.; Ceccucci, A.; Chakraborty, D.; Chivukula, R. S.; Cowan, G.; Damour, T.; DeGrand, T.; Desler, K.; Dobbs, M. A.; Drees, M.; Edwards, A.; Edwards, D. A.; Elvira, V. D.; Erler, J.; Ezhela, V. V.; Fetscher, W.; Fields, B. D.; Foster, B.; Froidevaux, D.; Gaisser, T. K.; Garren, L.; Gerber, H.-J.; Gerbier, G.; Gibbons, L.; Gilman, F. J.; Giudice, G. F.; Gritsan, A. V.; Grünewald, M.; Haber, H. E.; Hagmann, C.; Hinchliffe, I.; Höcker, A.; Igo-Kemenes, P.; JAckson, J. D.; Johnson, K. F.; Karlen, D.; Kayser, B.; Kirkby, D.; Klein, S. R.; Kleinknecht, K.; Knowles, I. G.; Kowalewski, R. V.; Kreitz, P.; Kursche, B.; Kuyanov, Yu. V.; Lahav, O.; Langacker, P.; Liddle, A.; Ligeti, Z.; Liss, T. M.; Littenberg, L.; Liu, J. C.; Lugovsky, K. S.; Lugovsky, s. B.; Mannel, T.; Manley, D. M.; Marciano, W. J.; Martin, A. D.; Milstead, D.; Narain, M.; Nason, P.; Nir, Y.; Peacock, J. A.; Prell, S. A.; Quadt, A.; Raby, S.; Ratcliff, B. N.; Razuvaev, E. A.; Renk, B.; Richardson, P.; Roesler, S.; Rolandi, G.; Ronan, M. T.; Rosenberg, L. J.; Sachrajda, C. T.; Sakai, Y.; Sarkar, S.; Schmitt, M.; Schneider, O.; Scott, D.; Sjöstrand, T.; Smoot, G. F.; Sokolsky, P.; Spanier, S.; Spieler, H.; Stahl, A.; Stanev, T.; Streitmatter, R. E.; Sumiyoshi, T.; Tkachenko, N. P.; Trilling, G. H.; Valencia, G.; van Bibber, K.; Vincter, M. G.; Ward, D. R.; Webber, B. R.; Wells, J. D.; Whalley, M.; Wolfenstsein, L.; Womersley, J.; Woody, C. L.; Yamamoto, A.; Zenin, O. V.; Zhang, J.; Zhu, R.-Y.

Publication: Journal of Physics G: Nuclear and Particle Physics, Volume 33, Issue 1, pp. 1-1232 (2006).

Publication Date: 07/2006

Authors

- The order of the authors **does matter**
  - usually the first ones are the most important ones
  - but each community has its habits (e.g. alphabetical order in mathematics)
- The first author should always be the one who directed the study and coordinated the writing

For you as young scientist it is important to appear as first author

Can I change the order of the authors

- while submitting ?
- during the revision ?

One last thing…

- If you are the lead author, then **you** are the one who decides and takes responsibility

- Return the favour = asking a scientist to be co-author when you wish to strengthen a collaboration with him/her.

  Use with care !

3. Abstract

Abstract or Summary ?

- **Abstract** : summarises the main points without detail. Articles start with an abstract.
- **Summary** : can be more detailed, including figures, etc.
  Theses include a summary.

Abstract

Abstract = **teaser / trailer**

Abstract

Good abstracts are

- **Clear** : short sentences, no jargon
- **Informative** : explain what the study is about, present the main outcome
- **Complete** : cover all key aspects of the work
- **Self-contained** : non-experts must be able to get the idea
- **Catchy** and attractive : to encourage people to continue reading
- **Brief** : typically < 200 words
- **Include keywords** : important for search engines

Abstract

Typical structure of a good abstract (this may vary)

Context	What are the issues ?
Objectives	What do I want to achieve ?
Method	How did I proceed ?
Results	What did I obtain ?
Consequences	What are the impacts and the perspectives ?

Detect the different sections in this abstract

Predicting function-related amino acids in proteins with unknown function or unknown allosteric binding sites in drug-targeted proteins is a task of paramount importance in molecular biomedicine. In this paper we introduce a simple, light and computationally inexpensive structure-based method to identify catalytic sites in enzymes. Our method, termed cutoff lensing, is a general procedure consisting in letting the cutoff used to build an elastic network model increase to large values. A validation of our method against a large database of annotated enzymes shows that optimal values of the cutoff exist such that three different structure-based indicators allow one to recover a maximum of the known catalytic sites. Interestingly, we find that the larger the structures the greater the predictive power afforded by our method. Possible ways to combine the three indicators into a single figure of merit and into a specific sequential analysis are suggested and discussed with reference to the classic case of HIV-protease. Our method could be used as a complement to other sequence- and/or structure-based methods to narrow the results of large-scale screenings.

from : Aubailly & Piazza, Sci. Rep. 5 (2015) 14874

Detect the different sections in this abstract

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from : Aubailly & Piazza, Sci. Rep. 5 (2015) 14874

Avoid in your abstract

- Acronyms (except for well-known ones such as UV, AI, …)
- Looooooooong sentences (especially for the French)
- Cryptic sentences
- Lack of conciseness
- Repetitions / redundant information
- Lack of information on the results /
  too much focus on the introduction only
- References (some exceptions are possible)

Abstract

Evaluate each single word in your abstract:
Is it useful, redundant ?
Is there a better alternative ?

Beyond the abstract

Some journals ask for additional material such as

- **Key points** that summarise the main findings

  focus on the main **outcomes**, NOT on what you did

- **Plain language summary** for the layman

  no jargon at all, focus on **societal impacts**

  more examples at
  https://publications.agu.org/plain-language-summaries-collection/

Example

Geophysical Research Letters

RESEARCH LETTER
10.1029/2020GL090115

Special Section:
Parker Solar Probe Observations at Venus: VGA1-2

Plasma Double Layers at the Boundary Between Venus and the Solar Wind

D. M. Malaspina[1,2], K. Goodrich[3], R. Livi[3], J. Halekas[4], M. McManus[3], S. Curry[3], S. D. Bale[3,5], J. W. Bonnell[3], T. Dudok de Wit[6], K. Goetz[7], P. R. Harvey[3], R. J. MacDowall[8], M. Pulupa[3], A. W. Case[9], J. C. Kasper[10], K. E. Korreck[9], D. Larson[3], M. L. Stevens[9], and P. Whittlesey[3]

[1]Department of Astrophysical and Planetary Sciences, University of Colorado Boulder, Boulder, CO, USA, [2]Laboratory for Atmospheric and Space Physics, University of Colorado Boulder, Boulder, CO, USA, [3]Space Sciences Laboratory, University of California, Berkeley, CA, USA, [4]Department of Physics and Astronomy, University of Iowa, Iowa City, IA, USA, [5]Physics Department, University of California, Berkeley, CA, USA, [6]LPC2E, CNRS, and University of Orléans, Orléans, France, [7]School of Physics and Astronomy, University of Minnesota, Twin Cities, Minneapolis, MN, USA, [8]NASA Goddard Space Flight Center, Greenbelt, MD, USA, [9]Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA, [10]Climate and Space Sciences and Engineering, University of Michigan, Ann Arbor, MI, USA

Abstract The solar wind is slowed, deflected, and heated as it encounters Venus's induced magnetosphere. The importance of kinetic plasma processes to these interactions has not been examined in detail, due to a lack of constraining observations. In this study, kinetic-scale electric field structures are identified in the Venusian magnetosheath, including plasma double layers. The double layers may be driven by currents or mixing of inhomogeneous plasmas near the edge of the magnetosheath. Estimated double-layer spatial scales are consistent with those reported at Earth. Estimated potential drops are similar to electron temperature gradients across the bow shock. Many double layers are found in few high cadence data captures, suggesting that their amplitudes are high relative to other magnetosheath plasma waves. These are the first direct observations of plasma double layers beyond near-Earth space, supporting the idea that kinetic plasma processes are active in many space plasma environments.

Plain Language Summary Venus has no internally generated magnetic field, yet electric currents running through its ionized upper atmosphere create magnetic fields that push back against the flow of the solar wind. These induced fields cause the solar wind to slow and heat as the flow is deflected around Venus. This work reports observations of very small plasma structures that accelerate particles, identifiable by their characteristic electric field signatures, at the boundary where the solar wind starts to be deflected. These small plasma structures observed at Venus have been studied in near-Earth space for decades but have never before been found near another planet. These structures are known to be important ctrical currents in space plasmas and the blending of dissimilar plasmas. Their strong demonstration that these small plasma structures are a universal plasma

Key Points:
- Plasma double layers are detected near the Venusian bow shock
- Multiple double layers are identified in a small amount of burst data
- Kinetic processes may help mediate interaction between the solar wind and induced magnetospheres

Correspondence to:
D. M. Malaspina,
David.Malaspina@lasp.colorado.edu

Citation:
Malaspina, D. M., Goodrich, K., Livi, R., Halekas, J., McManus, M., Curry, S., et al. (2020). Plasma double layers at the boundary between Venus and the solar wind. *Geophysical Research Letters*, *47*, e2020GL090115. https://doi.org/10.1029/2020GL090115

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Plain-language summary: tips

- Think about your audience (e.g. journalists, science-interested public). What is their level of science-specific knowledge? What is going to interest them in your work?
- NO jargon
- Explain what your study is about
- Explain what you found
- **Explain why this matters**. People want to ask "Why should I care ?"

Journalists are not interested in your results but in why they matter

from AGU

When should I write the abstract ?

- Tip

  Write your abstract **after** all other parts have been written

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