Physics 496
Introduction to Research

Lecture 2.1: Effective Abstracts

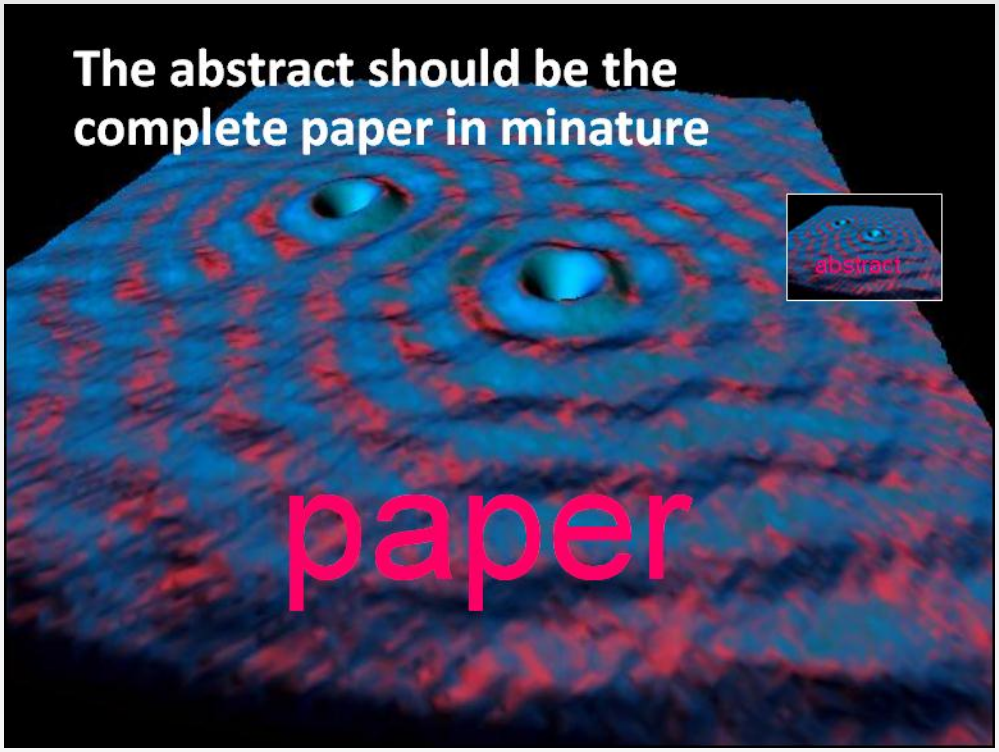
(CME+TML)

Concrete rules for abstracts

1. Every article must have one.

2. The quality of your abstract largely determines whether anybody actually reads your paper or comes to hear your talk.

In addition to being printed in the journal or the meeting program, abstracts are entered into electronic databases by commercial abstracting services., which has implications for how you prepare your abstract.

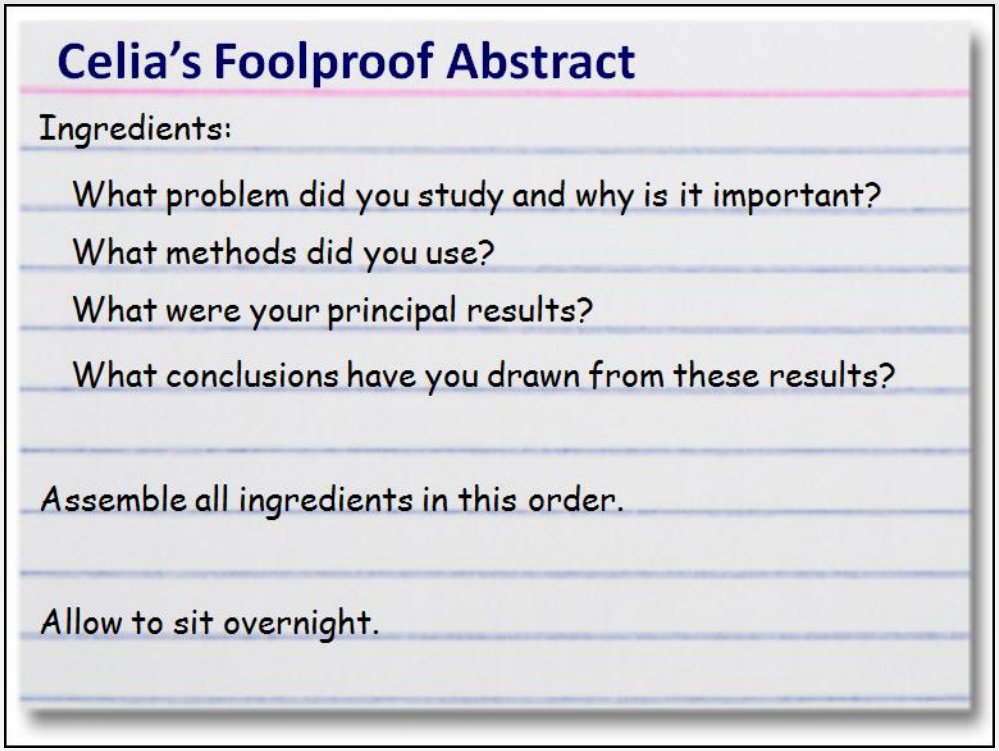


http://www.almaden.ibm.com/vis/stm/hexagone.html

An abstract should contain four distinct elements:

- A concise statement of the problem studied.
- A brief explanation of the approach used.
- A succinct description of the principal results obtained.
- A summary of the conclusions reached.

Write the abstract ***after*** you've finished the paper. Writing is an evolutionary process, and the focus or emphasis of a paper may change during the writing. The abstract must reflect the finished paper.



Celia's foolproof abstract recipe:

Answer the following questions, in this order, in one or two sentences each:

What problem did you study and why is it important?
What methods did you use?
What were your principal results?
What conclusions can you draw from your results about the problem you studied?

Make your sentences as <u>specific</u> and as <u>quantitative</u> as possible.

Control the length of the abstract by the length of the answers to the four questions. Don't omit any of the questions, and don't add superfluous information.

Short abstract?—one-sentence answers
Longer abstract?—several-sentence answers
One-page abstract?—one-paragraph answers

Use the abstract checklist:

Problem studied or hypothesis tested is stated immediately.

Significance of the work is explained.

Methods and operational ranges are specified.

Results are emphasized.

Principal conclusions are summarized.

The abstract stands alone

- No mention of figures or tables from the paper
- No references cited
- No undefined acronyms (except those that are widely known)
  - Don't rely on the abstract to define and acronym for the paper.
  - Therefore, don't define acronyms unless you will use them >1 time in the abstract.
  - The AIP lists common physics acronyms that need not be defined on first use

    BCS (Bardeen–Cooper–Schrieffer)
    emf (electromotive force)
    NMR (nuclear magnetic resonance)
    dc (direct current)
    rf (radio frequency)
    and many others; q.v.
    http://www.aip.org/pubservs/style/4thed/AIP_Style_4thed.pdf
- Only very simple (linear) equations may be used; some editors say no equations at all in abstracts. If you do include an equation, define all terms.
- No figures or tables may be included.

Be your own critic

- Read your (almost-finished) abstract critically:
  - Are ideas expressed clearly and concisely? Eliminate every superfluous word.
  - Are the words you use familiar and precise?
  - Have you used standard nomenclature and notation?
  - Have you observed standard stylistic conventions? (third person/passive voice?) (straightforward, unemotional narration?)
  - Is the text free of grammatical mistakes and typographical errors?
  - Does the length of the abstract conform to instructions from the journal or the meeting organizers?

Picked from today's arXiv

A new limit on the CP violating decay KS -> 3pi0 with the KLOE experiment

We have carried out a new direct search for the CP violating decay $K_S \to 3\pi^0$ with 1.7 fb^{-1} of e^+e^- collisions collected by the KLOE detector at the ϕ-factory DAFNE. We have searched for this decay in a sample of about 5.9×10^8 $K_S K_L$ events tagging the K_S by means of the K_L interaction in the calorimeter and requiring six prompt photons. With respect to our previous search, the analysis has been improved by increasing of a factor four the tagged sample and by a more effective background rejection of fake K_S tags and spurious clusters. We find no candidates in data and simulated background samples, while we expect 0.12 standard model events. Normalizing to the number of $K_S \to 2\pi^0$ events in the same sample, we set the upper limit on $BR(K_S \to 3\pi^0 < 2.6 \times 10^{-8}$ at 90% C.L., five times lower than the previous limit. We also set the upper limit on the η_{000} parameter, $|\eta_{000}| < 0.0088$ at 90% C.L., improving by a factor two the latest direct measurement.

http://arxiv.org/abs/1301.7623

On the third- and fourth-order constants of incompressible isotropic elasticity

Consider the constitutive law for an isotropic elastic solid with the strain-energy function expanded up to the fourth order in the strain, and the stress up to the third order in the strain. The stress-strain relation can then be inverted to give the strain in terms of the stress with a view to considering the incompressible limit. For this purpose, use of the logarithmic strain tensor is of particular value. It enables the limiting values of all nine fourth-order elastic constants in the incompressible limit to be evaluated precisely and rigorously. In particular, it is explained why the three constants of fourth-order incompressible elasticity μ, $\bar{A}$, and $\bar D$ are of the same order of magnitude. Several examples of application of the results follow, including determination of the acoustoelastic coefficients in incompressible solids and the limiting values of the coefficients of nonlinearity for elastic wave propagation.

http://arxiv.org/abs/1301.7448

IS HINCHLIFFE'S RULE TRUE? *

Boris Peon

Abstract

Hinchliffe has asserted that whenever the title of a paper is a question with a yes/no answer, the answer is always no. This paper demonstrates that Hinchliffe's assertion is false, but only if it is true.