How to Write Abstracts that Capture Your Audience

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From the editors of *J. Phys. Chem. Lett.* "Why Did You Accept My Paper?" 17 Jul 2014

1. The title and abstract are written in such a way that they are <u>simple and attractive</u>. They <u>draw sufficient interest</u> and lead to the reading of the rest of the paper. The <u>new advances</u> and the <u>importance</u> of the study are <u>clearly pointed out in the abstract</u>.

J. Phys. Chem. Lett. 2014, 5, 2443–2443

Three Immutable Rules for Abstracts:

#1—Every paper or talk must have one

#2—The quality of your abstract largely determines whether anybody actually *reads* your paper or *comes to your talk*

#3—Electronic indexing of abstracts has special implications for authors—don't put anything in an abstract that cannot be rendered in plain text

The purpose of an abstract is to get somebody to come to your talk or to read your paper

Attract their attention
in the first sentence

- **What did you *do*?**
- **What's new?**
- **Why is it interesting?**

Don't write "mystery-story" abstracts
("*all will be revealed later…*")

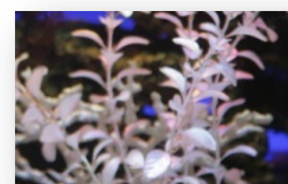
The abstract must reflect the entire paper or talk, in miniature

paper or talk

“good” abstract

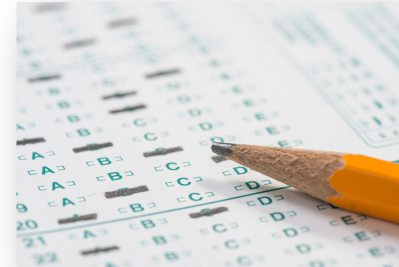
(contains all the fish)

“bad” abstract



(missing fish)

Quiz Question #1



What makes a busy scientist decide to read a paper or come to a talk?

a) The title

b) The reputation of the authors

c) The abstract

d) The references (is his or her own work cited?)

Answer: Probably all of the above

a) The title

b) The reputation of the authors

c) The abstract

d) The references (is his or her own work cited?)

If you're a young scientist without a big reputation yet, you *must* pay particular attention to providing an effective title* and a <u>GOOD ABSTRACT!</u>

*** http://people.physics.illinois.edu/Celia/Titles.pdf**

To whip up a perfect abstract...

follow the recipe!

Celia’s Foolproof Abstract

Four Ingredients:

What problem did you study and why is it important?

What method(s) did you use?

What were your principal results?

What conclusions have you drawn from these results?

Assemble all ingredients in this order.

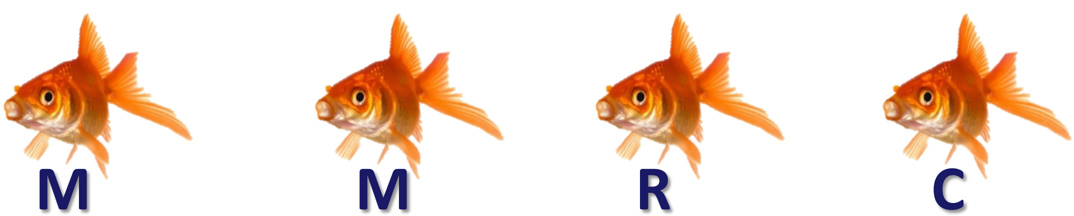
Measure carefully and taste repeatedly.

Allow to sit overnight. Taste again and adjust seasonings.

Hew to this recipe (MMRC) witlessly*

1. M—Give the motivation and context
2. M—Explain what you did in sufficient detail, so the reader knows if your work is relevant and applicable to his or hers
3. R—Emphasize your principal results
4. C—Tell the reader what you think the results mean

****Nothing* else. Really.**



Here's an excellent* abstract:

PRL **107,** 117401 (2011) PHYSICAL REVIEW LETTERS week ending 9 SEPTEMBER 2011

Optical Response of Relativistic Electrons in the Polar BiTeI Semiconductor

J. S. Lee,[1,*] G. A. H. Schober,[2,3] M. S. Bahramy,[4] H. Murakawa,[5] Y. Onose,[2,5] R. Arita,[2,4] N. Nagaosa,[2,4] and Y. Tokura[1,2,4,5]

The transitions between the spin-split bands by spin-orbit interaction are relevant to many novel phenomena such as the resonant dynamical magnetoelectric effect and the spin Hall effect. We perform optical spectroscopy measurements combined with first-principles calculations to study these transitions in the recently discovered giant bulk Rashba spin-splitting system BiTeI. Several novel features are observed in the optical spectra of the material including a sharp edge singularity due to the reduced dimensionality of the joint density of states and a systematic doping dependence of the intraband transitions between the Rashba-split branches. These confirm the bulk nature of the Rashba-type splitting in BiTeI and manifest the relativistic nature of the electron dynamics in a solid.

Motivation + Methods + Results + Conclusions

*(MMRC)

Special thanks to Lance Cooper for pointing out this abstract to me.

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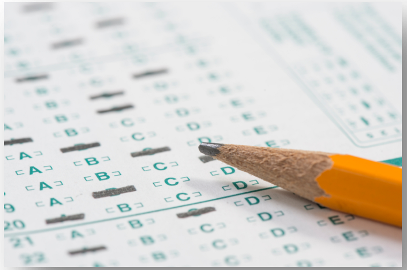
Motivation + Methods + Results + **Conclusions**

Quiz Question #2



What is the most common mistake that abstract writers make?

a) Including too much introductory material

b) Being vague and overly general

c) Using too much jargon

d) Failing to consider their audiences' wants, motivations, and needs

Answer: I'd say d)*

a) Including too much introductory material

b) Being vague and overly general

c) Using too much jargon

d) Failing to consider their audiences' wants, motivations, and needs

*Although *any* of these mistakes will cost you readers and listeners

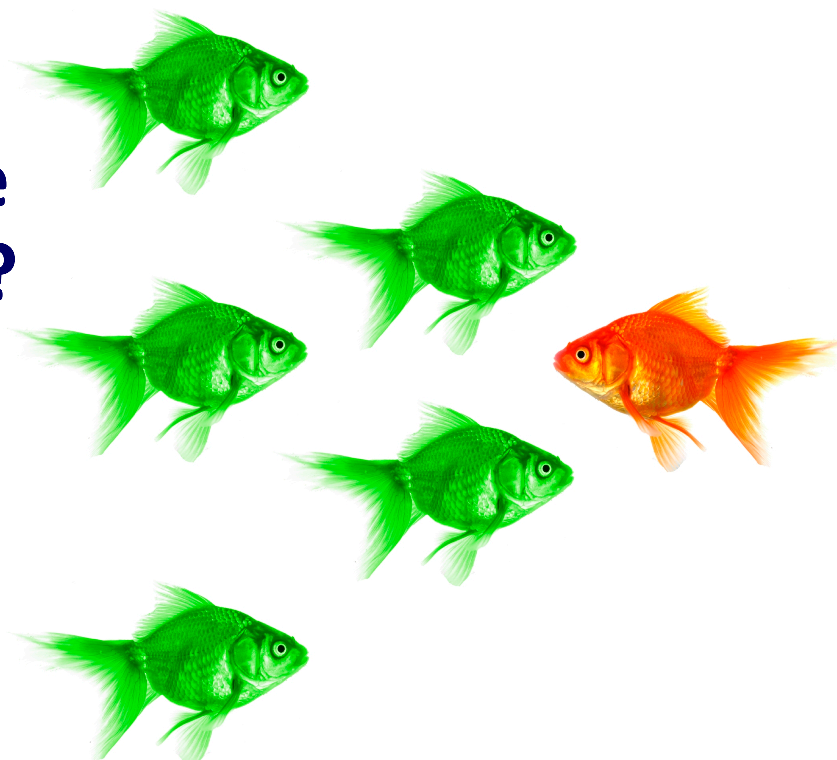
As in any writing project, your first question should be “Who’s the audience?”

What do they already know?

What’s their motivation for reading your article or coming to your talk?

What is their level of expertise?

How can you best meet their needs?



One-size abstracts *do not* fit all

An abstract for a journal article is usually more specific and detailed than a meeting abstract

An abstract for a specialized journal (*Phys Rev B*) will be different from one for a general journal (*Science*)

The structure (MMRC) will usually be the same, but the level of detail, specificity, and use of specialized language will vary with the intended audience

No fluff* in your abstract

No introductory fluff—get straight to the point in the first sentence

No sweeping generalizations at the end

(No drama either—be objective!)

* http://people.physics.illinois.edu/Celia/Lectures/Fluff.pdf

Here’s a “fluffy” abstract:

Energy and environment are two major concerns of the modern world. Transition to the sustainable clean energy globally in the future, however, depends on the development of next generation electrical energy storage systems. Among the energy storage techniques considered at present, rechargeable lithium-ion batteries, which are ubiquitous in today's portable electronic devices and now enable the electric vehicles, remain promising to facilitate the use of renewable energy on a large scale. For such application, transformational changes in battery technologies are critically needed, which require a fundamental understanding of the complex, interrelated physical and chemical processes between electrode materials and electrolytes. Soft x-ray absorption spectroscopy(sXAS) is a powerful tool to probe the chemical species and the electronic states with elemental sensitivity. This presentation will discuss examples on using sXAS to study battery materials for both fundamental understanding and practical developments. We will showcase how sXAS fingerprints the battery operation by detecting the evolving electron states. Recent results on SEIs and Li-rich cathode materials will be discussed. Our results offer important information for improving Li batteries.

Motivation? + Methods? + Results? + Conclusions?

Here’s a “fluffy” abstract:

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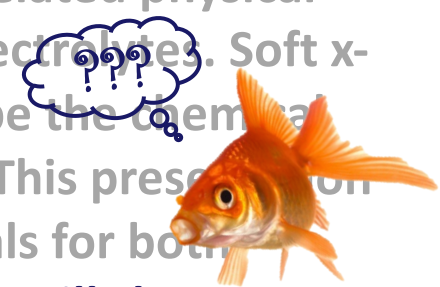
Motivation? + Methods? + Results? + Conclusions?

It’s a mystery story, too

Energy and environment are two major concerns of the modern world. Transition to the sustainable clean energy globally in the future, however, depends on the development of next generation electrical energy storage systems. Among the energy storage techniques considered at present, rechargeable lithium-ion batteries, which are ubiquitous in today's portable electronic devices and now enable the electric vehicles, remain promising to facilitate the use of renewable energy on a large scale. For such application, transformational changes in battery technologies are critically needed, which require a fundamental understanding of the complex, interrelated physical and chemical processes between electrode materials and electrolytes. Soft x-ray absorption spectroscopy(sXAS) is a powerful tool to probe the chemical species and the electronic states with elemental sensitivity. This presentation will discuss examples on using sXAS to study battery materials for both fundamental understanding and practical developments. **We will showcase how sXAS fingerprints the battery operation by detecting the evolving electron states. Recent results on SEIs and Li-rich cathode materials will be discussed. Our results offer important information for improving Li batteries.**



Motivation + **Methods? + Results? + Conclusions?**

Read your draft abstract critically

Ideas are clear and concise

Language is precise and familiar to your audience

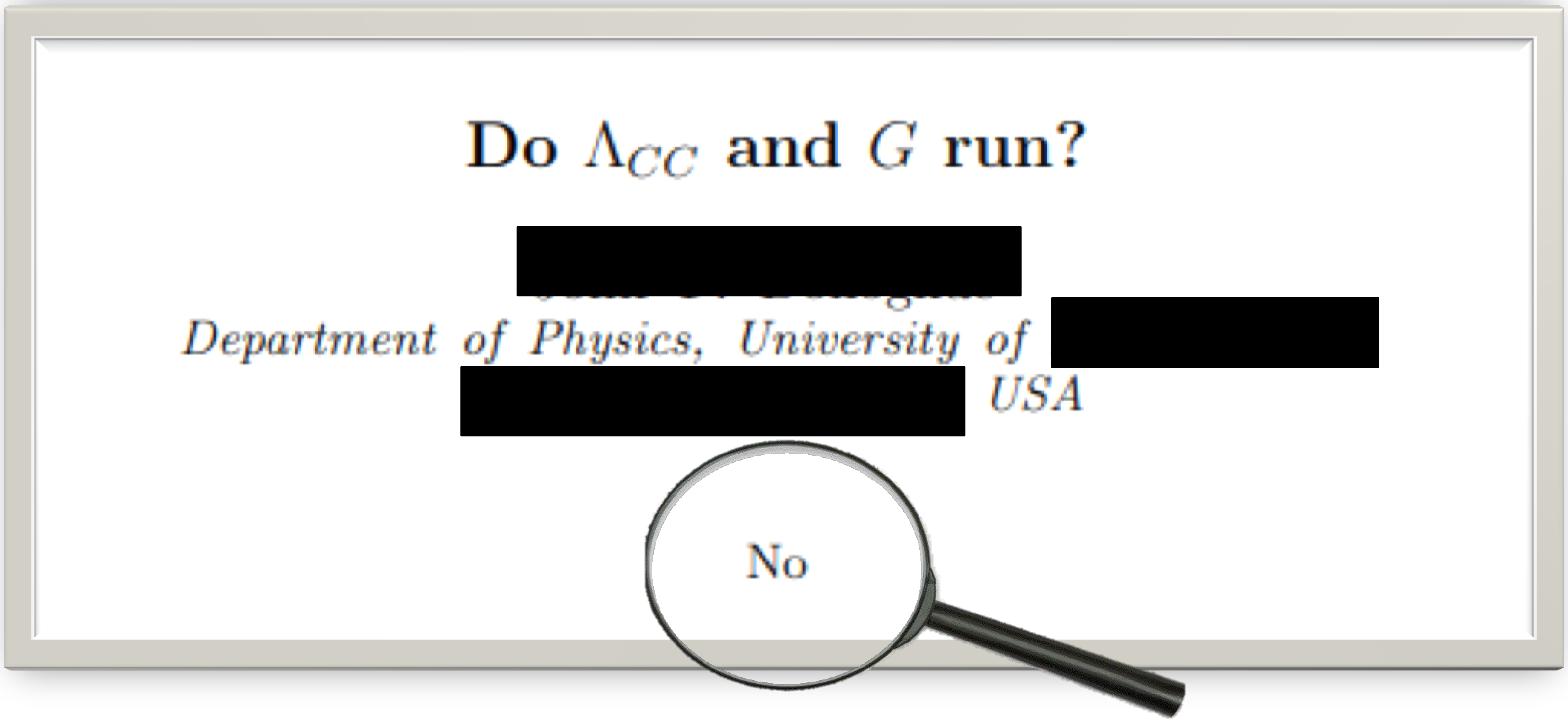
Statements are specific, quantitative, and objective

Conclusions are supported

Text is free of errors

Length limits are observed

MMRC rule-violating abstract:


Do Λ_{CC} and G run?

[redacted]

Department of Physics, University of [redacted]

[redacted] *USA*

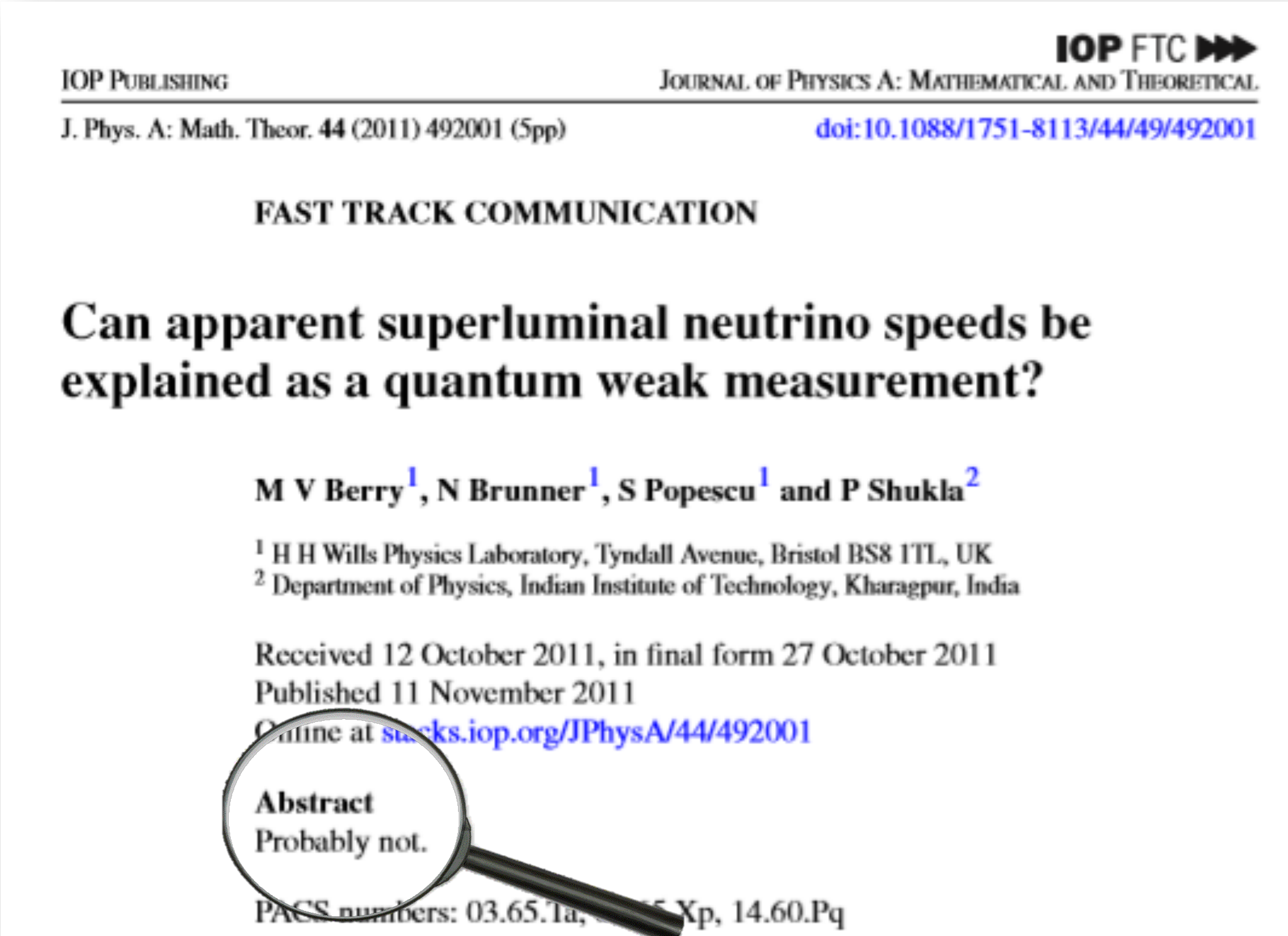
No

https://arxiv.org/pdf/2412.08773

I have some grave reservations about the title, too… https://arxiv.org/abs/2412.08773.

Special thanks to Chinmay Ambasht for finding and sharing!

Another one for the record book…


IOP FTC
IOP Publishing — Journal of Physics A: Mathematical and Theoretical
J. Phys. A: Math. Theor. 44 (2011) 492001 (5pp) doi:10.1088/1751-8113/44/49/492001

FAST TRACK COMMUNICATION

Can apparent superluminal neutrino speeds be explained as a quantum weak measurement?

M V Berry[1], N Brunner[1], S Popescu[1] and P Shukla[2]

[1] H H Wills Physics Laboratory, Tyndall Avenue, Bristol BS8 1TL, UK
[2] Department of Physics, Indian Institute of Technology, Kharagpur, India

Received 12 October 2011, in final form 27 October 2011
Published 11 November 2011
Online at stacks.iop.org/JPhysA/44/492001

Abstract
Probably not.

PACS numbers: 03.65.Ta, [illegible]Xp, 14.60.Pq

Note that these abstracts illustrate Hinchliffe's rule…

To Recap:

Know thy audience!

Follow the MMRC recipe

Scale your abstract by adjusting the size of the "ingredients," not by adding or omitting any

Eliminate introductory fluff

Don't write "mystery-story" abstracts

Write with the expectation that you will rewrite

cmelliot@illinois.edu
http://physics.illinois.edu/people/Celia/

For the next activity, go to

Physics 496
Communicating in Physics
Spring 2025

Home | Syllabus | Lectures | Homework | WW | Resources | Ms. P.

Class Schedule

Consult the class schedule regularly; it may be revised as the semester unwinds. The lastest version of the schedule will be posted here. A grading matrix summarizes the assignments and points that will be awarded for each.

General Course Information

Please review the general course information prior to class.

Materials for In-Class Activities

Journal articles, check lists, review forms, and other written materials will be used for activities during class periods. You can access them through this link. Use of these materials is restricted to students enrolled in PHYS 496, and they are not to be further disseminated or shared.

With your team, write an abstract for this seminal paper

Remember M – M – R – C !