

Writing Effective Titles

PHYSICAL REVIEW LETTERS

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The title is a key element of any form of scientific communication.

The quality and effectiveness of your title is critical in attracting a reader’s attention and in getting appropriate “hits” in electronic databases.

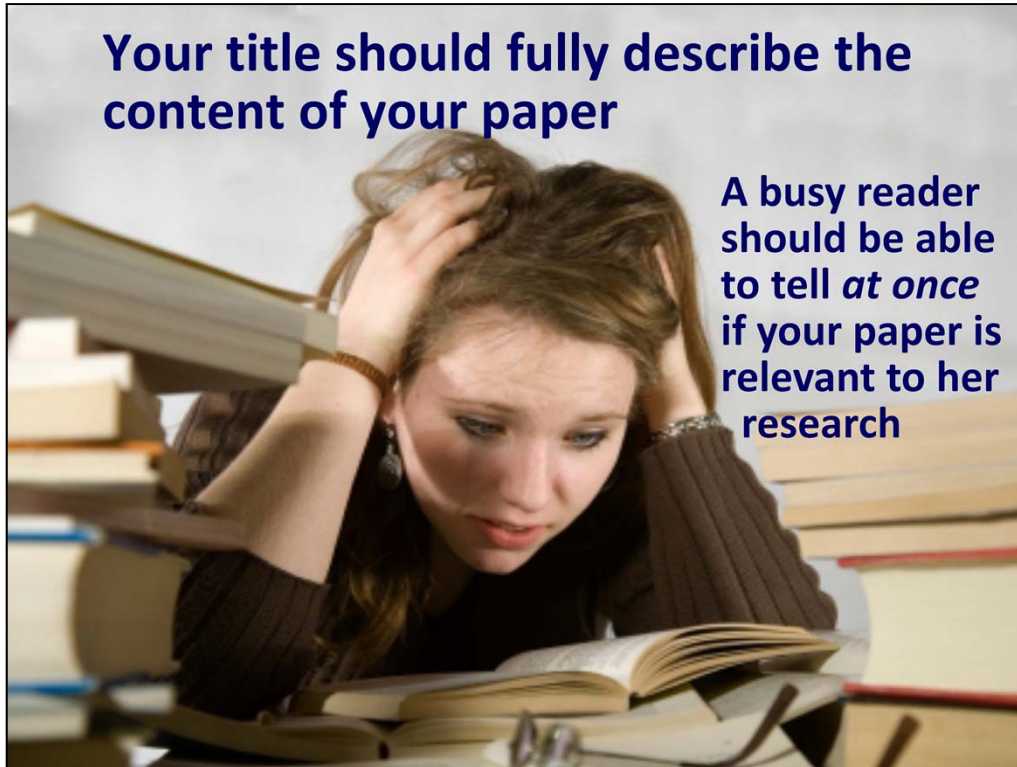
Here, we focus on how to write a title for maximum effect.



Busy scientists employ three criteria when deciding if they will invest their time in reading a paper or attending a talk:

1. The information conveyed in the title.
2. The reputation of the author—if you're a young scientist without a reputation yet, see #1 and #3.
3. The abstract (more about abstracts next week...)

The title must accurately and succinctly convey the content of the paper and allow a busy reader to immediately decide if the paper is applicable to his or her work.



Your title should fully describe the content of your paper

A busy reader should be able to tell *at once* if your paper is relevant to her research

Write down key words that define and describe your paper. These are the words that belong in your title.

A title doesn't have to capture every nuance of every detail of the paper, but it should accurately represent "the big picture."



The title must accurately and succinctly convey the content of the paper.

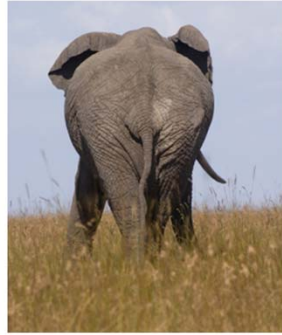
Play fair; don't "trick" people into reading your paper by a misleading title.

Wastes their time.

Ruins your reputation (see point #2 on Slide 2).

**Make it interesting, but not
*too interesting...***

**“Looking from the East at an Elephant Trotting
West: Direct CP Violation in B^0 Decays”**



I am not making this up—<http://arxiv.org/abs/hep-ph/0203157>

Keep titles as short as possible



**<12 words;
<10 is even better***

Your prospective reader is not going to remember more than that many words anyway

***That's about the number of words a reader can take in and process as he or she is scanning down a list**

Scientists scan down a list of titles in the table of contents in a journal, or the latest postings to one of the electronic archives, or to the results of an electronic lit search; you have ≈ 1 sec to capture their attention.

Limit titles to <12 words; <10 is even better. That's about the span of words the human eye can recognize and process as it is scanning down a list.

Important papers don't have to have long, "impressive" titles:

"Theory of superconductivity," J. Bardeen, L. Cooper, and J.R. Schrieffer, *Phys. Rev.* **108**, 1175 (1957). Three words--cited 9703 times.

Principles of Magnetic Resonance, Charles P. Slichter, 3rd. ed. (New York, Springer, 1990). Four words; cited 7371 times

"Ground state of the electron gas by a stochastic method," D.M. Ceperley and B.J. Alder, *Phys. Rev. Lett.* **45**, 566 (1980). Ten words--cited 10 428 times.

"Dynamics of the dissipative two-state system," A.J. Leggett et al., *Rev. Mod. Phys.* **59**, 1 (1987). Seven words--cited 3667 times.

"Spin echoes," E.L. Hahn, *Phys. Rev.* **80**, 580 (1950). Two words--cited 4402 times.

Try an experiment. Go to <http://arXiv.org/list/physics/recent>, and see how much time you spend looking at the titles of each article before you decide whether it looks interesting as you read down the

list.

Help your poor reader; put keywords first



Original Title: Application of the time-dependent local density approximation to conjugated molecules

My edit: *Time-dependent local density approximation for conjugated molecules*

Original Title: A novel approach to estimate the stability of one-dimensional quantum inverse scattering

My edit: *New stability estimate for 1D quantum inverse scattering*

Have pity on your busy, overwhelmed reader. Make it easy for them to understand the subject of your paper immediately.

Front load the key words to attract a busy reader's attention.

Examples:

Original Title #1: 11 words, introductory fluff

Improvement #1: 8 words, keywords front loaded

Original Title #2: 13 words, introductory fluff, "a novel approach" will be discussed next...

Improvement #2: 8 words, keywords first

No introductory fluff

~~On the nature of the~~ “hostless” short GRBs

~~Capabilities of~~ parallel analyses of the structure of materials by field ion and scanning probe microscopy

~~Unveiling the~~ impurity band induced ferromagnetism in the magnetic semiconductor (Ga,Mn)As



“Frontload” key words; get them on the left side of the list to make an impression

Good advice from AIP: “Words that do not carry information, such as “The...,” “A...,” “On...,” “Investigation of...,” “Study of...” should be omitted from titles.”

The *Phys. Rev.* journals also proscribe

“More about...”, “...revisited”, and dangling participles (“...using...”)

No introductory fluff

~~On the nature of the~~ “hostless” short GRBs
Hostless short gamma ray bursts

~~Capabilities of~~ parallel analyses of the
structure of materials by field ion and
scanning probe microscopy (14 words)

**Field ion vs scanning probe microscopy
for materials characterization** (9 words)

~~Unveiling the~~ impurity band induced
ferromagnetism in the magnetic
semiconductor (Ga,Mn)As
**Impurity band-induced ferromagnetism
in (Ga,Mn)As**



Good advice from AIP: “Words that do not carry information, such as “The...,” “A...,” “On...,” “Investigation of...,” “Study of...” should be omitted from titles.”

The *Phys. Rev.* journals also proscribe

“More about...”, “...revisited”, and dangling participles (“...using...”)

Do not use qualitative words



“novel” “interesting” “important”

Do not use words in the title that make qualitative statements about the work being reported:

“precise,” “accurate”

“important,” “influential”

“innovative,” “unique,” “unprecedented,” “ground-breaking,” “brilliant”

“new”--maybe

Quantitative statements are okay, e.g., “Measurement of the negative muon anomalous magnetic moment to 0.7 ppm,” G.W. Bennett et al., *Phys. Rev. Lett.* **92**, 161802 (2004).

**Do not use the names of people*,
places*, coined words, equations**



***unless it's standard nomenclature,
e.g., Lorentz force, quantum Hall effect,
Monte Carlo method**

The *Phys. Rev.* journals also proscribe the name of the accelerator or the type of detector used in paper titles (but the particle physicists seem to violate this rule constantly and with impunity—*cme*).

“people’s names”—unless they are a common adjective. “Fourier transform,” “Green’s function,” “Auger spectroscopy,” “Brillouin limit” are fine. “New Results from the Greene Laboratory at the University of Illinois” is not.

“coined words”—if the word isn’t used outside your own research group, don’t put it in the title; same thing goes for narrow, technical jargon. Exception: “Mottness,” P. Phillips, *Ann. Phys.* **321**, 1634-1650 (2006). **BUT**—he’d written about 10 papers on this topic before publishing “Mottness,” and the editor fought him on it anyway.

“equations”—don’t put anything in a title that cannot be rendered in straight ASCII text.



No unfamiliar acronyms

Original Title: One-dimensional SPH method

**My edit: Smoothed-particle hydrodynamics 1D method
for gas dynamics applications**

**Original Title: Application of CVS filtering to mixing in
two-dimensional homogeneous turbulence**

**My edit: Coherent-vortex-simulation filtering for 2D
homogeneous turbulence**

“unfamiliar acronyms”—the AIP Style Guide provides a list of acronyms that are so common they don’t have to be defined at first use; anything else, leave out of the title.

Examples of allowed acronyms: BCS, bcc, cw, EPR, ESR, fcc, ir, NMR, QCD, QED, rf, RNA, uv

Original Title: One-dimensional SPH method

IMPROVED Title: *Smoothed-particle hydrodynamics 1D method for gas dynamics applications*

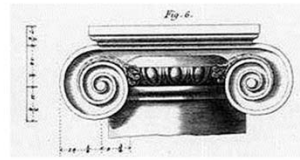
NOTE: Although this title is longer than the original, it avoids the unfamiliar acronym and provides specific information that may be needed by the reader; the original title is probably too generic to be useful.

Original Title: Application of CVS filtering to mixing in two-dimensional homogeneous turbulence

IMPROVED Title*: *Coherent-vortex-simulation filtering for 2D homogeneous turbulence*

**This example may or may not be an “improved” title; it depends on what the author deems is most important and would be of most interest to readers.*

Capitalization: “Title” or “sentence”?



Nuclear Physics B

Five-loop ϵ expansion for $O(n) \times O(m)$ spin models

Physical Review Letters

Complexity of Small Silicon Self-Interstitial Defects

Physical Review B

Electronic excitations on silver surfaces

Science

Making Nanoscale Materials with Supercritical Fluids

Just look it up...

There's no consistency to the use of capitalization in paper titles—not even among journals published by the same publisher. Just look it up. If you're sure you know, look it up anyway. You will learn humility.

Acta Crystallographica

Crystallography of a new metastable phase in Zr-N alloy

Nuclear Physics B

Five-loop ϵ expansion for $O(n) \times O(m)$ spin models

Physical Review Letters

Complexity of Small Silicon Self-Interstitial Defects

Physical Review B

Electronic excitations on silver surfaces

Science

Making Nanoscale Materials with Supercritical Fluids

Now for a quiz:



**Remember: A good title is
concise, descriptive, interesting**

**“Investigation of accumulation, evolution,
and penetration of gaseous products
produced by nuclear fission reactions”**

Behavior of gaseous nuclear-fission products

**“An Overall Picture of the Gas Flow in
Massive Cluster Forming Region: The Case
of G10.6-0.4”**

***Gas Flow in Massive Cluster-Forming
Region G10.6-0.4***

“Pair contact process with diffusion of pairs”



“Efficiency for preforming molecules from mixtures of light Fermi and heavy Bose atoms in optical lattices: the strong-coupling-expansion method”

21 words! <sigh>

Strong-coupling expansion method for efficiently preforming light-Fermi–heavy-Bose molecules in optical lattices

**“Optimization of the Neutrino Factory,
~~revisited~~”**

**knowing what kind of “optimization”
would be nice, too**

**~~“A note on the~~ implications of gauge
invariance in QCD”**

“A meaningful expansion around detailed balance”



~~“Noise and Controllability”~~ supression of
controllability in large quantum systems”

**“Unique nature of the lowest Landau level
in finite graphene samples with zigzag
edges: Dirac electrons with mixed bulk-
edge character”**



To recap:

Keep it short

Frontload key words

Provide enough information

Make it interesting

