



**Writing an Effective
Statement of Purpose**



**...and getting into an internship,
REU, or graduate school**

Celia M. Elliott
University of Illinois
cmelliot@illinois.edu

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Today we'll look at how to craft a compelling statement of purpose for internships, REU appointments, and grad school applications.

Don't underestimate the importance of an effective statement of purpose—it is often the tie-breaker in decisions on whether to offer or deny a position.

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Objective: Convince the reader that you're a good investment

- **You have the requisite skills, experience, and desire to succeed**
- **You understand that doing independent research is different from taking classes, and you're excited about research**
- **You have the maturity to work on your own and the discipline to persist despite obstacles and setbacks**

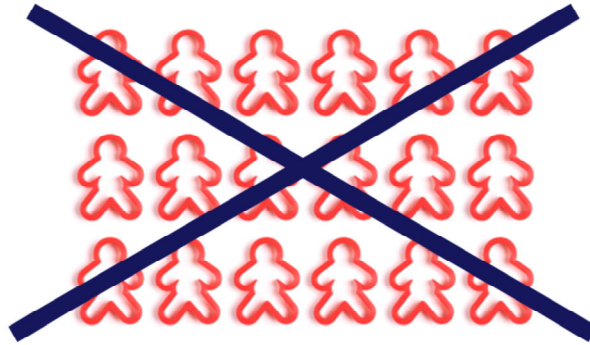
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The company, REU site, or department that hires you will spend thousands of dollars on your training. Make it clear why they should invest in your career.

BE HONEST. Don't exaggerate or give inappropriate emphasis. Be sincere.

Write it yourself—in your own words. I can give you suggestions and help with proofreading, but I will NOT do the kind of heavy-duty editing that you've come to know (and fear). Your statement of purpose must reflect your voice and your writing abilities, not mine.—*cme*

Caveat: One size *does not* fit all



**Write a general “core” document and then
customize it for each application**

Requirements vary—READ the instructions

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READ the instructions and follow them witlessly. Pay particular attention to font sizes, margins, and page, word, and character limits.

Address every point mentioned, in the order that they’re presented in the instructions. Make it easy for a reader to see that you have included everything that was asked for. (Use the same structure and the same words that are given in the instructions.)

Adhere to page and word limits, if stated. If a page limit is not stated, restrict your SOP to no more than two single-spaced pages in a readable (11-pt. min.) font.

Beware of the pitfalls of word processing. It’s heartbreakingly easy to copy what you’ve written for Cornell into a new document for Ohio State and forget that stray “I really want to come to Cornell University” in the fourth paragraph. But the Buckeyes will be insulted and will have doubts about your attention to detail.

The first step—who is your audience?



Answer: HR professionals* or senior faculty*
What will make them read beyond your first paragraph?

What will make you stand out from the crowd?

**who have read thousands of applications*

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The first step in writing **anything** is to think about who is going to read it. Put yourself in the shoes of the person who is going to make the decision. What would your reader find interesting about your goals and experience? What would she like to know more about?

Experienced human resources experts, business managers, or academic physicists are going to be reading your statement of purpose. DO NOT write *anything* that you do not thoroughly understand!

Next ask yourself questions...



**...write down the answers and
make a sentence outline**

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First-order questions:

**What have I learned as an undergrad?
about physics? about myself?**

What do I enjoy doing?

What do I do well?

What do I want to learn more about?

**What do I know about “research” and
why is that a good career choice for me?**

**What are my career expectations? my
dreams?**

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Second-order questions:

How can I show that I finish what I start?

How can I show that I'm creative?

How can I show that I can overcome adversity?

How can I show that I have an aptitude for physics (or materials science, or electrical engineering, or medicine)? for research?

How can I show that I have what it takes to be successful in this field?

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Use the C-A-R paradigm to emphasize your strengths

Challenge

Action

Result



Select examples that show your resourcefulness, creativity, persistence

Be specific; provide meaningful details

Explicitly state what you learned or contributed

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Mastering the CAR paradigm is also important for job applications, job interviews, CVs, and other communications pieces that you will have to write over the course of your career.

For example, the NIH now requires that all grant applicants provide, as a section of their biosketches, a brief summary of their contributions to research. The NIH provides the following advice for young scientists:

“What advice do you have for new scientists filling out their scientific contributions?”

“It is a little early to tell how each discipline will judge its new scientists. You might want to consult with your colleagues who serve as reviewers in your area of science. In general, reviewers base their expectations for contributions based on the seniority of the person filling out the biosketch. A scientist with one publication may want to summarize the key finding of the paper and its importance in a short contribution. Scientists with no publications may wish to provide a contribution describing their efforts on other peoples’ papers and projects (e.g., I used this method, I conducted the literature review for this paper, I care for all the animals in this lab, etc.). If a new scientist has *no* actual research or thesis experience, they might just want to list one contribution about their training to date.”

http://grants.nih.gov/grants/policy/faq_biosketches.htm#4572

Next, devise a strong lede



I fell in love with physics on the Moscow Metro.

“There is nothing more soothing than an earthquake.” Not the first sentence that comes to mind when thinking about fault zones, but it’s true for me; at heart I’ll always be a geophysicist.

When I was 16, a wise man once told me: “I consider you to be a failure—you aren’t a real physicist yet. Real physicists are either addicted to coffee or beer....so you should probably start drinking some coffee.” In my quest to become a real, coffee-drinking physicist, I have learned a lot about how research is conducted, how to think about a problem from the bottom up, how to explain a physical phenomenon to a third-grader, and somewhat importantly, how to make a great espresso.

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Write like a journalist—capture the reader’s attention with an engaging, intriguing first sentence.

Return to the subject of your lede in the final paragraph of your statement to “wrap up” the idea and end with a bang.

Tips for you lede:



Make it short—no more than one short paragraph

Make it personal—reveal something of yourself that you think the reader would want to know

Make sure it aligns with your research goals

Make it current—the admissions committee doesn't care about your trip to the Adler Planetarium in 6th grade

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Your lede should be very short—no more than a few sentences that immediately transition into your goals for the position and why you think you'll be successful.

Your lede should differentiate you from the other 800 people who are applying for the position. They *all* want to become physicists to unravel the mysteries of nature.

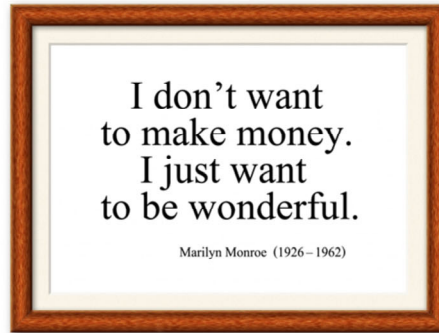
Clearly tie your lede to your academic interests, experiences, and career goals.

Now start writing a first draft

- 1. Use the answers to your questions to identify important points you want to make**
- 2. Arrange the points in an outline that tells a logical, coherent, persuasive story**
- 3. Make sure your outline conforms to the prompt for that particular position or department and includes all requested information**
- 4. Fill in the outline with real sentences**
- 5. Revise**
- 6. Give your statement to your adviser to read and ask for constructive criticism**
- 7. Incorporate suggestions and revise**
- 8. Repeat Steps 6 and 7—again**

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Clearly state your short- and long-term career goals—be specific



How will this particular position or department prepare you to achieve those goals?

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Examples of short-term* goals:

Explore one or two subfields of physics in greater depth

Settle on a thesis topic and find an adviser

Get familiar with the literature

Learn new theoretical approaches or experimental techniques

Polish your communications and teaching skills

Contribute to a research group

***What you want to accomplish in the next two years**₁₃

Examples of long-term* goals:

Research new semiconducting materials in an industrial lab

Become a professor at a research university

Start a high-tech company to manufacture sensors to detect fissile materials for national security

Become a quantitative analyst in the financial industry

Contribute to the nation's energy independence through research at a national lab

Design new biocompatible materials for targeted drug delivery

***Where you want to be in 10 years** 14

Accentuate the positive and showcase your research, problem-solving and communication skills

Why are you a particularly strong prospect?

Have you had to overcome any unusual obstacles that have contributed to your maturity or intellectual growth?

Don't use slang. Convey that you are a serious professional.

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Why are you a particularly strong prospect?

Have you had to overcome any unusual obstacles in your life that have contributed to your maturity or intellectual growth?

Communications skills—as in everything else you write, ***consider your audience***. They may not be experts in your narrow field; don't use jargon; define your terms.

Don't use slang. Convey that you are a serious professional. You don't have to be stuffy, but you must be professional.

Use positive language* and active verbs



Do or do not. There is no "try."

— Master Yoda, *The Return of the Jedi*

***No "wishing" or "trying" or "hoping"—
state what you are going to do.**

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Show that you are in charge of your destiny and that you understand that **you** are responsible for your success.

"Hopefully" means "full of hope" or "in a hopeful manner"; it does not mean "I hope" or "it is to be hoped." At least that's my opinion, and I'm sticking to it.

Bryan Garner (with whom I agree about 95 percent of the time, although he is wrong occasionally) claims that this battle was lost in the 1980s, and I am condemned to old-fuss-budget status for insisting on the distinction. He devotes almost one full page of *Garner's Modern American Usage* to the controversy. Despite wimping out and accepting the late-20th-century abuse of "hopefully," Garner ends with the following admonition:

"Fourth, though the controversy swirling around this word has subsided, it is now a SKUNKED TERM. Avoid it in all senses if you're concerned with your credibility: if you use it in the traditional way, many readers will think it odd; if you use it in the newish way, a few readers will tacitly tut-tut you."

Bryan A. Garner, *Garner's Modern American Usage*
(Oxford, Oxford University Press, 2003), pp. 412–413.

Count me among the tut-tutters.—*cme*

What about deficiencies?

- A low grade in a key physics course
- Disastrous GRE scores
- That one semester you partied too hard
- A suboptimal GPA

**“It is better to offer no
excuse than a bad one.”**

—George Washington

Get advice from your adviser



Library of Congress (Gilbert Stuart)

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Are there any deficiencies in your academic record or test scores that you should explain?

Talk to your adviser and your letter writers about whether an explanation will help or hurt your chances. If the deficiency is so egregious that it casts doubt on your ability to be successful in graduate study, *somebody* must discuss it. A letter writer may be able to offer a more convincing explanation than you can; he or she at least has the cloak of objectivity.

If you feel compelled to discuss the problem, focus on what the experience has taught you, what you've done to overcome the problem, and how you are better equipped to face adversity in the future because of it.

Own your mistakes and take responsibility for your actions.

“A man can fail many times, but he isn't a failure until he begins to blame somebody else.” John Burroughs, 1837–1921, U.S. naturalist and essayist, influential in the conservation movement in the United States

Map your strengths and interests to this particular opportunity

Show that you have

- **Thoughtfully and thoroughly investigated the opportunity**
- **Found that it fits your interests and goals**
- **Planned how you will succeed**

TO REPEAT: Your SOP must be separately tuned to each opportunity you're applying to—sending identical statements of purpose to different programs or companies is a recipe for disaster

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Mention specific faculty members or research projects in which you're interested. If the department has unique facilities, show that you know about them and explain how learning to use them will prepare you to achieve your overall goals.

Here's an example:

I am interested in optical communications and networks. During my senior year, I worked with Professor Jim Eckstein, who is developing an all-optical frequency shifter that employs a microwave source phase-locked to the optical pulse repetition rate. I believe that the Applied and Engineering Physics Program at Cornell would offer an ideal environment for me to expand these interests. The work that Professor Clifford Pollack is doing on the interaction of ultrashort pulses with fiber optic devices is particularly intriguing. I am also interested in ...

**Relate your interests to your experience
and to that specific opportunity**

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But don't box yourself in...

**Make it clear that you are
flexible and adaptable**

**Explicitly state that you
will welcome exploring
options beyond the ones
you specifically mention**

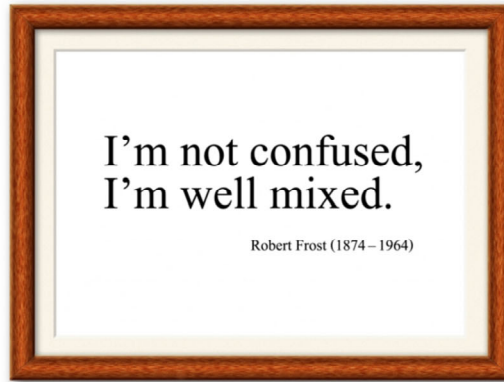


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Do be specific about your general interests and objectives, but don't paint yourself into a corner.

If all you write about is the work being done in Professor Jones' group and how much you want to join that group, and Professor Jones isn't taking any students for two years, the committee may decide to admit somebody else.

Have your adviser review your SOP for physics accuracy



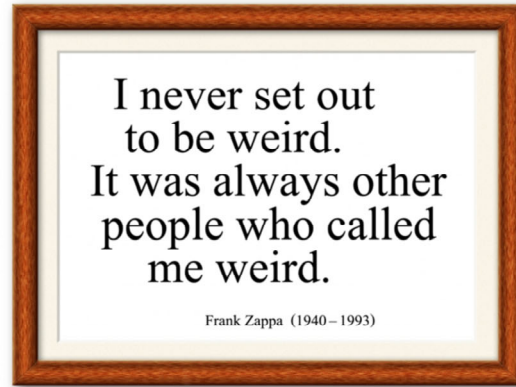
Don't write *anything* about physics or your research that you do not thoroughly understand

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Describe your research concisely and emphasize ***what you contributed***.

Don't get bogged down in details—the committee doesn't care how long it took to anneal the sample or how long it took to pump down the chamber. They want to know how you formulate a hypothesis, attack a problem, determine the validity of an approach, know when you're "done," decide what to do next.

**Set yourself apart from the crowd,
but do so prudently and tastefully**



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“Physicist—rock star? Rock star—physicist? What do I want to be?”

Express yourself

lucidly,

elegantly,

concisely[‡]



**‡ The likelihood of the spontaneous appearance
of these effects in a first-and-only draft
asymptotically approaches 0.**

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Some final advice:

Write a “core” document and then tailor it for each separate application

Don’t underestimate the time required

If external letters are required, line up your letter writers *early*

Proofread *everything*—more than once, from a hard copy

End with a bang! Don’t just trail off at the end of your statement....



cmelliot@illinois.edu

Notes: