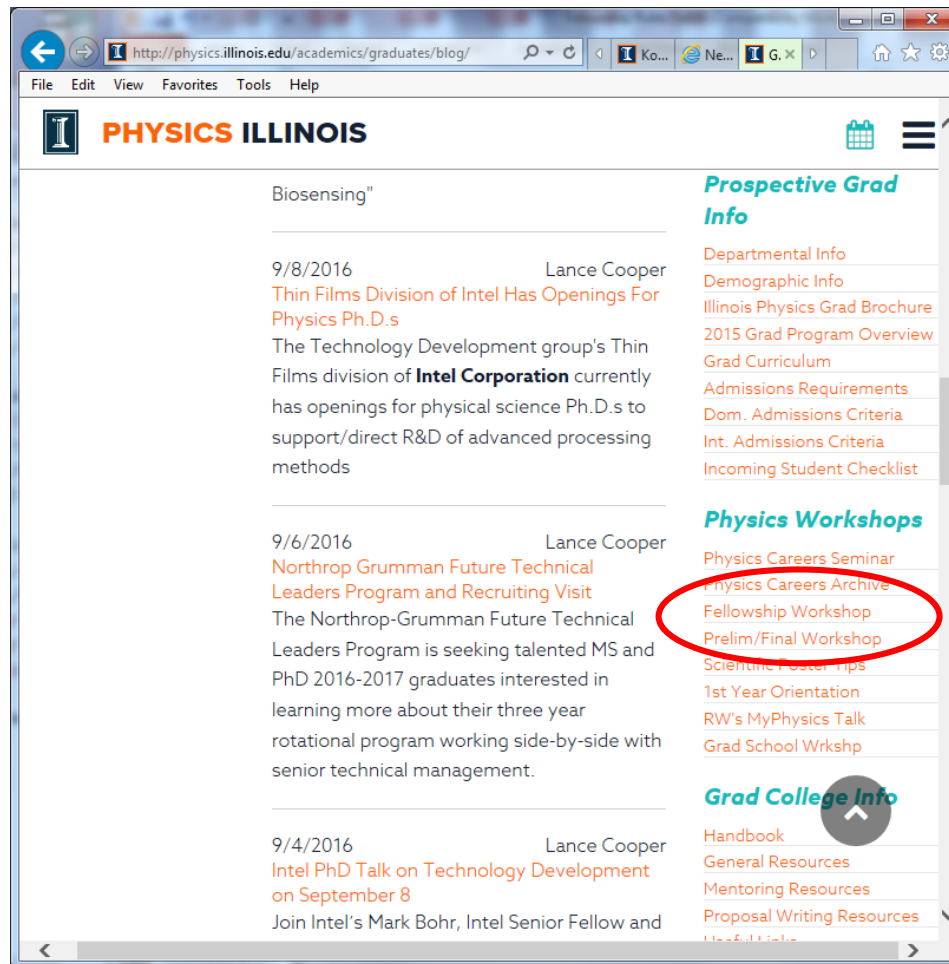


# 2016 NSF Grad Fellowship Workshop

Workshop slides will be posted on the Physics Grad Blog:  
<http://physics.illinois.edu/academics/graduates/blog/>



<https://courses.physics.illinois.edu/phys596/fa2016/fellowship-workshop.html>

# NSF Grad (and Other) Fellowships: Why Apply?

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(1). Chances of getting an award are significant!

**2008:** 10% success rate (1000 Awards)

**2011:** 17% success rate (2000 Awards)

**2015:** 12% success rate (2000 Awards)

**2016:** 12% success rate (2000 Awards)

**2017:** 2000 awards will be offered (pending available funds)

(2). Application process is great preparation for:

Proposals you'll write later

Papers you'll write later

Sorting out your research interests

# NSF Grad (and Other) Fellowships: Why Apply?

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(3). Three years of support from the NSF\*!

\$34,000 stipend each year

\$12,000 educational allowance to institution

**Provides you enormous flexibility in your research options!**

\*The three years of support can be spread out over five years

# NSF Grad Fellowships: Supported Disciplines

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## Supported Disciplines:

Chemistry (Oct. 28)

Life Sciences (Oct. 26)

Materials Research (Oct. 25)

Mathematics (Oct. 28)

**Physics and Astronomy** (Oct. 28)

Science, Technology, Engineering, and Math Education (STEM) – Research focused only (Oct. 27)

All by 5 p.m. local time!

## NOT supported:

MD/PhD programs; Medical; Education

# NSF Grad Fellowships: Eligibility

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- (1). U.S. citizens, nationals, permanent residents
- (2). Enrolled in accredited US institution by Summer or Fall 2017
- (3). Generally, a bachelor's degree earned prior to Fall 2017. The following students are generally eligible:
  - During the senior year of college
  - During the first year of graduate school
  - Prior to completing the Fall term in 2nd year of grad school.

***Applicants must have completed no more than 12 months of full-time graduate study or its equivalent as of Aug. 1, 2016.***

You're ineligible:

- If you've obtained a graduate degree (e.g., an MS)
- If you've done more than 12 months of graduate work  
*(it's OK if you enrolled the summer before to do research!)*

# New Eligibility Requirement

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Effective as of the 2017 competition (Fall 2016 deadline), NSF will limit graduate students to only one application to the GRFP, submitted either in the first year **or** second year of grad school.

***There is no change to the eligibility of undergrad students.***

***Second-year grad students who applied last year may apply again this year.***

# Application Strategy

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Should you apply for a 2017 NSF Grad Fellowship?

***Senior undergrads: YES***

***Second-year grad students: YES***

***First-year grad students: Probably NOT\****

\*The answer to this depends on whether you've been involved in significant research with your research adviser yet and on how you do academically during your first year of grad school

# Characteristics of Successful Grad Student NSF GRFP Applications

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## Senior Undergrad Applicants:

Had high undergrad GPA ( $\geq 3.8$ )

Most had publications (both published and in preparation)

All had presentations and awards

## 1<sup>st</sup>-year Grad Applicants:

Had high undergrad GPA ( $\geq 3.8$ )

Most had publications (both published and in preparation)

All had presentations and awards

## 2<sup>nd</sup>-year Grad Applicants:

Had high 1<sup>st</sup>-year grad GPA ( $\geq 3.7$ )

Had publications (both published and in preparation)

Had presentations and awards



# NSF Grad Fellowships: A Complete Application

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- (1). Personal, Relevant Background, and Future Goals Statement (3 pages maximum)
- (2). Graduate Research Plan (2 pages maximum)
- (3). Transcripts, uploaded into FastLane  
Redact personal information (e.g., SSN, date of birth, etc.) from transcripts before sending!
- (4). **Three** letters of reference required. Must be received by Nov. 3 at 5 p.m., local time. Applications with only 2 letters will be reviewed, applications with only 1 letter will be returned without review.

# NSF Grad Fellowships: A Complete Application

---

- (1). Personal, Relevant Background, and Future Goals Statement (3 pages maximum)
- (2). Graduate Research Plan (2 pages maximum)
- (3). Transcripts, uploaded into FastLane  
Redact personal information (e.g., SSN, date of birth, etc.) from transcripts before sending!
- (4). **Three** letters of reference required

# **The Personal, Relevant Background, and Future Goals Statement (3 pages max):**

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The **Personal, Relevant Background, and Future Goals Statement** is where you outline your professional development plans and career goals. In this essay, you describe how you envision graduate school preparing you for a career that allows you (i) to contribute to expanding scientific understanding and (ii) to broadly benefit society:

1. Describe your personal, educational, and/or professional experiences that motivate your decision to pursue a PhD in science
2. Include specific examples of research and/or professional activities in which you have participated.
3. Present a concise description of the activities, highlight the results and discuss how these activities have prepared you to seek a graduate degree
4. Specify your role in previous research activities, including the extent to which you worked independently and/or as part of a team
5. Describe the contributions of your activity to advancing knowledge in science, technology, engineering, or mathematics fields, as well as the potential for broader impacts

# **Questions to address in Personal, Relevant Background, and Future Goals Statement:**

1. Why are you fascinated by your research area?
2. What examples of leadership skills and unique characteristics do you bring to your chosen field?
3. What personal and individual strengths do you have that make you a qualified applicant?
4. How will receiving the fellowship contribute to your career goals?
5. What are all of your applicable research experiences?
6. For each experience in (5), what were the key questions, methodologies, findings, and conclusions?
7. Did you work in a team and/or independently?
8. How did you assist in the analysis of results?
9. How did your activities address the Intellectual Merit and Broader Impacts criteria?

# **A survey of past successful Personal, Relevant Background, and Future Goals Statements had:**

1. Specific opening Motivation/Inspiration Statements
2. Use of bold headings to highlight specific parts of the essay (e.g., Motivation, Outreach/Broader Impact Activities, Research Experiences, Future Plans/Directions, etc.)
3. Use of subheadings and paragraphing to separate different outreach activities and research experiences
4. In Outreach, statements of specific past activities and specific planned activities
5. In Research Experiences, statements of specific accomplishments and failures
6. Explicit statements of broader impact and intellectual merit of project
7. Summary: statements of long-term career goals and of how NSF fellowship will help applicant achieve career goals
8. References

# Typical Structure of Successful Personal, Relevant Background, and Future Goals Statements:

## Motivation/Inspiration

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-----  
-----

## Outreach/Broader Impacts

### Outreach Activity #1

-----  
-----

### Outreach Activity #2

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-----

## Research Experiences

### Research Exp #1

-----  
-----

### Research Exp #2

-----  
-----

## Future Plans

## References

# NSF Grad Fellowships: A Complete Application

---

- (1). Personal, Relevant Background, and Future Goals Statement (3 pages maximum)
- (2). Graduate Research Plan (2 pages maximum)
- (3). Transcripts, uploaded into FastLane  
Redact personal information (e.g., SSN, date of birth, etc.) from transcripts before sending!
- (4). **Three** letters of reference required

# The Graduate Research Plan (2 pages):

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In this statement, you should present an original research topic that you would like to pursue in graduate school.

## You should:

1. Describe the research area (What?), why this research is important (Why?), why you are ideally suited to conduct this research (Why You?), and how you plan to perform the research (Methods?).
2. Discuss unique resources to which you have access that may be needed for accomplishing the research goal (e.g., local or national facilities, collaborations, etc.)
3. Include important literature citations.
4. Address the potential of the research to advance knowledge and understanding within science as well as the potential for broader impacts on society.



# Questions to address in the **Graduate Research Plan**:

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1. What issues in the scientific community are you most passionate about?
2. Do you possess the technical knowledge and skills necessary for conducting this work, and/or will you have sufficient mentoring and training to conduct the study?
3. Is your plan feasible for the allotted time and institutional resources available?
4. How will your proposed research contribute to the “big picture” outside the academic arena?
5. How does your proposed research address the Intellectual Merit and Broader Impacts criteria?

# A survey of past successful **Graduate Research Plans** had:

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1. A clear statement of a Hypothesis to be tested or an Objective to be achieved
2. Use of bold headings to highlight specific parts of the essay (e.g., Introduction/Background/Motivation, Research Plan/Proposed Research, Intellectual Merit, Broader Impacts, Research Methodology, Anticipated Results, etc.)
3. Use of subheadings and paragraphing to separate different proposed activities
4. Use of underlining and bold lettering to highlight key phrases in paragraphs
5. Explicit statements of broader impact and intellectual merit of project
6. Specific details about different stages of various research plans
7. Specific statements of expected outcomes if research is successful
8. Specific statements of preliminary results, if available
9. References

# Typical Structure of Successful Graduate Research Plans:

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**Introduction/Background/Hypothesis**

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-----

**Proposed Research/Objectives**

**Project #1**

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**Project #2**

-----

**Intellectual Merit**

-----

**Broader Impacts**

-----

**Anticipated Results**

**References**

# NSF Grad Fellowships: Key Review Criteria

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## The Two Key NSF Review Criteria:

1. **Intellectual Merit** – the potential of the research to advance knowledge
2. **Broader Impacts** – the potential of the research to benefit society

All proposals must address both of these review criteria!!

“When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria, **intellectual merit** and **broader impacts**.”

# NSF Review Criteria: Intellectual Merit

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**Intellectual Merit** is a statement about your intellectual ability to conduct scholarly research, including the ability to:

1. Plan and conduct research
2. Work both independently and as a member of a team
3. Interpret and communicate research (e.g., analyze data, read the literature, communicate your results to others, etc.)
4. Advance knowledge through your research and outreach activities

# Assessment of Intellectual Merit

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The **Intellectual Merit** of your proposal will be judged based upon your:

1. Academic performance; awards and honors
2. Communication skills (i.e., well-written proposal!, previous publications and presentations)
3. Evidence of independence and creativity
4. Publication/presentation record
5. Soundness of your research plan
6. Quality of references
7. Extent of research experience
8. Access to essential resources for work proposed

# NSF Review Criteria: Broader Impacts

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**Broader Impacts** is a statement about the extent to which your proposed work will:

1. Integrate research and education, and assure that your findings will be communicated broadly and to as wide an audience as possible
2. Encourage diversity, broaden opportunities, and enable participation of all citizens – particularly underrepresented groups – in science and research
3. Enhance scientific and technical understanding
4. Benefit society and contribute to ***specific***, desired societal outcomes

# Assessment of Broader Impacts

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The **Broader Impacts** of your proposal will be judged based upon your:

1. Prior accomplishments, previous outreach work, etc.
2. Integration of research and education
3. Potential to reach diverse audiences
4. Potential to impact society
5. Community outreach
6. Leadership potential



# Document Formatting (Important!)

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1. Read solicitation carefully and follow all formatting rules!

<http://www.nsf.gov/pubs/2016/nsf16588/nsf16588.htm>

The essays must be written using standard 8.5" x 11" page size, 12-point, Times New Roman or LaTeX font, 1" margins on all sides, and must be single spaced (~5 lines per inch) or greater.

- Only references and footnotes may be a smaller font, no less than 10-point Times New Roman or LaTeX fonts.
- The **Personal, Relevant Background, and Future Goals Statement** has a maximum length of 3 pages, and the **Graduate Research Plan** has a maximum length of 2 pages (including all references, citations, charts, figures, and images).

Failure to comply fully with these requirements will eliminate the application from consideration by review panels.

Additionally, applications that are incomplete (missing required transcripts and/or reference letters, or that do not have "submitted" status by the application deadline) are ineligible for panel review.

# NSF Grad Fellowships: A Complete Application

---

- (1). Personal, Relevant Background, and Future Goals Statement (3 pages maximum)
- (2). Graduate Research Plan (2 pages maximum)
- (3). Transcripts, uploaded into FastLane  
Redact personal information (e.g., SSN, date of birth, etc.) from transcripts before sending!
- (4). **Three** letters of reference required
  - Institutional letterhead if possible
  - Two-page limit
  - 12-point Times New Roman in body of letter
  - Name and title of reference writer
  - Department and institutional organization

# Reference Letters: (due 8 p.m. Eastern time, Nov. 5, 2015)

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1. Must submit **three** letters (they will accept just 2)
2. Give your letter writers sufficient time to prepare strong letters
3. They should know you both personally and as a scientist (i.e., be able to address your research abilities/accomplishments)
4. Give your letter writers copies of your CV and application materials addressing Intellectual Merit and Broader Impacts (reference letters are supposed to reflect both your “intellectual merit” and “broader impacts”)
5. Make sure your letter writers are informed of the formatting requirements for their letters (see previous slide)

Make sure ALL letters arrive by deadline!! You can track letter submission via FastLane

# Tips for Preparing a Competitive Application

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1. Read solicitation carefully and abide by all rules!  
<http://www.nsf.gov/pubs/2016/nsf16588/nsf16588.htm>
2. Make sure to address the Intellectual Merit and Broader Impacts criteria
3. Have someone proof read your proposals for grammatical and spelling errors (Celia and I can do this!)
4. If possible, associate yourself with a research group here, to increase authenticity of your proposal
5. Devise real educational outreach components, preferably attached to existing programs
6. Regularly check status of reference letters
7. Make sure to press “Submit” button!

# NSF Grad Fellowship Precompetition

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**Eligibility:** You must be eligible for, and planning to submit applications to, the NSF Grad Fellowship program

**Application Requirements:** Following two (2) components of the NSF grad fellowship application: (i) Personal, Relevant Background, and Future Goals Statement (3 pages); and (ii) Graduate Research Plan (2 pages)

## NSF Grad Fellowship Precompetition Timeline:

**5 p.m., Oct. 4, 2016:** NSF Grad Fellowship pre-competition applications are due

**Oct. 14, 2016:** Competition awards announced and feedback on applications provided to students

**Oct. 28, 2016:** Deadline for submitting full applications to NSF

**For more information, see post:**

<http://physics.illinois.edu/academics/graduates/blog/article/18833>

# Lessons from Past Precompetitions:

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## **Problems with the Proposal as a Whole:**

Submitted after the deadline

Incorrect font (Times New Roman) and font size (12)

Essays longer than maximum limit

## **Problems with the Personal, Relevant Goals, and Future Goals Statement:**

No motivation for proposed research, no statement of research interests or what makes student especially suited for research

No statement of career goals and how the fellowship will impact those goals

Essays longer than maximum limit

# Lessons from Past Precompetitions:

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## **Problems with the Personal, Relevant Goals, and Future Goals Statement (cont.):**

Not suitable for a general audience (too technical, no big picture)

No indication of how various previous experiences impact your ability to be successful in future research

No statement of how previous collaborations, publications, poster presentations, etc., influence your future plans

# Lessons from Past Precompetitions:

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## **Problems with the Graduate Research Plan:**

Didn't address the What, How, Why, Why You, How Long, and Benefits Questions.

Research not described in an accessible manner (too many undefined technical terms, acronyms, etc.)

Didn't address Intellectual Merit or Broader Impacts criteria

Didn't address how past experiences/training make student ideally suited to conducting research proposed

No references!



# For More Information

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Information: [www.nsf.gov/grfp](http://www.nsf.gov/grfp) and [www.nsfgrfp.org](http://www.nsfgrfp.org)

Apply at: [www.fastlane.nsf.gov/grfp/](http://www.fastlane.nsf.gov/grfp/)