Applying for the 2021 NSF Graduate Research Fellowship (GRF) in 2020

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READ THE GRF PROGRAM GUIDELINES!

https://www.research.gov/grfp/checkGuidelines.do?method=loadQuickLinkPage

VISIT THE GRFP WEB PAGE FOR APPLICANTS

https://www.research.gov/grfp/Login.do

and FAQ's site

https://www.nsf.gov/pubs/2019/nsf19081/nsf19081.pdf

GRF consists of three years of support over a five-year fellowship period ($138,000). Of that, NSF provides an annual stipend of $34,000 to the Fellow and a cost-of-education allowance of $12,000 to the graduate degree-granting institution for each Fellow who uses the support in a fellowship year.

Also eligibility for + $1,000 **international travel** award, **GROW** (+ $5,000 for international study) and **GRIP** (+ $5,000 for internships at federal agencies, national labs)

Topics

- General GRFP and Application Information
- Eligibility
- The Application
- Reference Letters
- A few FAQs
- Resources. Video tutorial at https://www.nsfgrfp.org/applicants/grfp_application_tutorial

Features

- **Eligibility**: Research for MS and PhD degrees
- **Portability** – fellowship stays with student as long as he/she is enrolled in grad school full time in an NSF-recognized field, even If you change schools
- **Flexibility** – award is for 3 years full support, but may be used in any window over 5 years as long as recipient stays enrolled full time for all 5 years

Some background on the GRFP

- **In 2020, 2,076 GRF awards offered and 1,787 honorable mentions**
- 2014 study finding: 70.5% awarded to students enrolled in doctoral program; 24.8% to students in combined MS/PhD program; 3.5% in MS-only programs.
- Between 2011 and 2018, success rate was ~15%
- Uneven distribution of awards: in 2017, 10 schools received 31% of award. Just Berkeley, MIT and Cornell students received 14% ("NSF graduate fellowships disproportionately go to students at a few top schools," *Jane C. Hu Aug. 26, 2019 , Science Magazine*.)

2020 CU Awards

- 25 awardees at Boulder
  - Physics and Astronomy (2)
  - Chemistry (3)
  - Geosciences (3)
  - Engineering (11)
  - Computer Science (1)
  - Mathematical Sciences (1)
  - Social Sciences (4)
- 5 awardees at Denver
  - Life Sciences (4)
  - Bioengineering (1)

Selection Process

- Panel review and recommendations by academics and research-active professionals in relevant field
- Applicant ratings ranked by “Quality Group” (QG)
  - **QG1 “Highly Recommended” – probable award**
  - **QG2 “Recommended” – possible award**
- NSF decides on awards – usually most or all of QG1 and some of QG2
- “Honorable Mention” to QG1 and QG2 ranks not receiving an award
- 2017 data: QG1 + QG2 = 3,809, or 29.3% of applicants.
- If you are have “QG” ranking, probability of an award is 54%!

ALL APPLICATIONS MUST BE UPLOADED TO FASTLANE BY 5:00 PM LOCAL TIME (e.g., MDT)

SUBJECT AREAS	GRF APPLICATION DUE DATE
LIFE SCIENCES	OCTOBER 19, 2020
COMPUTER AND INFORMATION SCIENCE AND ENGINEERING; MATERIALS RESEARCH; PSYCHOLOGY; SOCIAL SCIENCES; STEM EDUCATION AND LEARNING	OCTOBER 20, 2020
ENGINEERING	OCTOBER 21, 2020
CHEMISTRY; GEOSCIENCES; MATHEMATICAL SCIENCES; PHYSICS AND ASTRONOMY	OCTOBER 22, 2020

DAY/TIME DEADLINES ARE RIGID. PLAN TO SUBMIT EARLY. FASTLANE SOMETIMES CRASHES IN HEAVY TRAFFIC. AWARDS ANNOUNCED IN EARLY APRIL.

ELIGIBILITY INFORMATION

- Fellowship applications **must be submitted by the prospective Fellow via FastLane**.
- **Applicants must first register with Research.gov:** at the GRFP website **https://www.research.gov/grfp/Login.do prior to submitting an application**. (**REGISTER EARLY** EVEN IF YOU AREN'T SURE ABOUT APPLYING)
- **Very helpful FAQ page: https://www.nsfgrfp.org/applicants/faq**
  Confirmation of acceptance in a graduate degree program in science or engineering is required at the time of Fellowship acceptance, May 1, 2021.

- **Prospective Fellows** must be prepared to enroll in a university, college, or non-profit academic institution of higher education accredited in, and having a campus located in, the United States, its territories, or possessions, or the Commonwealth of Puerto Rico that offers advanced degrees in STEM or STEM education **no later than fall 2021**.
- All Fellows from the **date of Acceptance through Completion or Termination of the Fellowship must be affiliated with a graduate degree-granting institution** accredited in, and having a campus located in, the United States, its territories, or possessions, or the Commonwealth of Puerto Rico.
- NSF especially encourages women, members of underrepresented minority groups, persons with disabilities, and veterans to apply (see stats). **NSF also encourages undergraduate seniors to apply.**

APPLICANT ELIGIBILITY

BY THE APPLICATION DEADLINE

- Be a **U.S. citizen, national, or permanent resident**
- Intend to enroll or be enrolled full-time in a research-based master's or doctoral degree program in an eligible Field of Study in STEM or STEM education
- If previously offered a Graduate Research Fellowship, have declined by the acceptance deadline
- **Have never previously applied to GRFP while enrolled in a graduate degree program**
- **Have never earned a doctoral or terminal degree in any field**
- **Have never earned a master's or professional degree** (see joint bachelor's-master's degree information below) in any field, or completed more than one academic year in a graduate degree-granting program, **unless (i) returning to graduate study after an interruption of two (2) or more consecutive years immediately preceding the application deadline, and; (ii) are not enrolled in a graduate degree program at the application deadline**
- Not be a current NSF employee

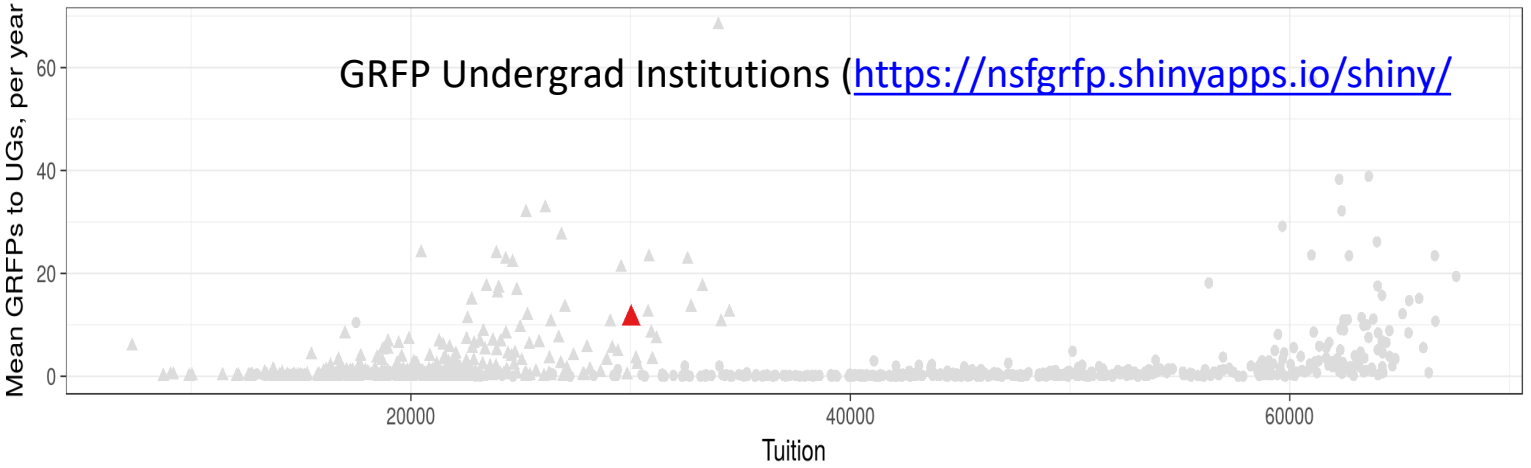
Number of Times An Individual May Apply

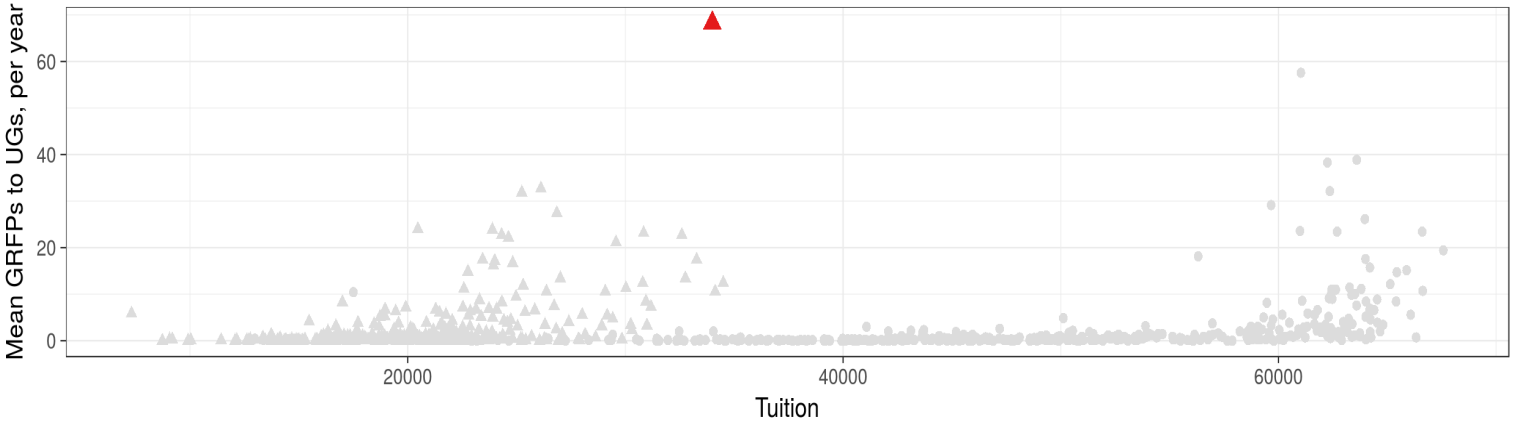
- **Undergraduate seniors** and bachelor's degree holders who have never enrolled in a graduate degree program have **no restrictions on the number of times they can apply before enrolling in a degree-granting graduate program**.
- **Graduate students** enrolled in a degree-granting graduate program are limited to only **one application to the GRFP, submitted in the first year or beginning of the second year of their degree program**.
- Individuals applying while enrolled in a **joint bachelor's-master's degree** program who have completed 3 years of study may **apply one time** to GRFP
- Individuals holding joint bachelor's-master's degrees, currently enrolled as first-year doctoral students, **may only apply in the first year of the doctoral program**.
- Applications withdrawn by November 15 of the application year do not count toward the one-time graduate application limit. **Applications withdrawn after November 15 count toward this one-time limit.**
- Applications not reviewed by NSF (returned without review) do not count toward the one-time graduate application limit.
- There is a limited opportunity for returning graduate students to apply for a graduate research fellowship. (see https://www.nsf.gov/pubs/2020/nsf20587/nsf20587.pdf)

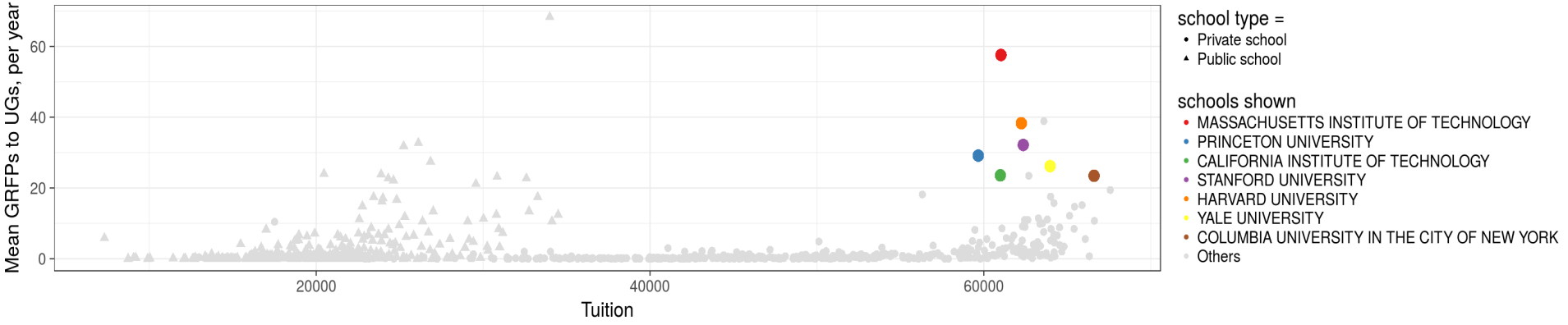
ELIGIBILITY RESTRICTION RATIONALE

- **INTENT OF RESTRICTION**
  - **EARLY CAREER - RECRUIT/RETAIN RESEARCHERS**
  - **STREAMLINE REVIEW PROCESS**
  - **Broaden participation in STEM research with more opportunity for participation people by not yet in graduate school.**
- **Did not produce wider distribution of awards by school**

GRFP Undergrad Institutions (https://nsfgrfp.shinyapps.io/shiny/







GRF PROGRAM DESCRIPTION

- The Graduate Research Fellowship Program (GRFP) awards Fellowships for graduate study leading to **research-based master's and doctoral degrees in STEM or in STEM education**. Reviews and deadlines are assigned based on the Major Fields of Study listed in the X Appendix of nsf20587 and subfields are used to designate the expertise of reviewers.
- **1 application → Major Field of Study**
- **GRFP supports individuals** proposing a **comprehensive holistic plan for graduate education that takes into account individual interests and competencies. A holistic plan describes past experiences, attributes, and academic achievements and, when considered in combination, shows how the applicant has demonstrated potential for significant research achievements in STEM or in STEM education. Thus, an applicant must provide a detailed profile of her or his relevant educational and research experiences and plans for graduate education in such a way as to demonstrate this potential for significant achievements.**

The following programs, areas of graduate study, and research are INELIGIBLE for GRF support:

- **Individuals are not eligible to apply if they will be enrolled in a practice-oriented professional degree program such as medical, dental, law, and public health** at the start of the fellowship.
- Individuals are not eligible to apply if they will be enrolled in an area of graduate **study focused on clinical practice, for example, counseling, social work, as well as patient-oriented research, epidemiological and behavioral studies, outcomes research and health services research**.
- **Individuals are not eligible to apply for support of biomedical research with disease-related goals**,
- There are **areas of bioengineering research in biology and medicine that are eligible. These are research in bioengineering to aid persons with disabilities and research on diagnosis or treatment of human disease provided it applies engineering principles** to problems in biology and medicine while primarily advancing engineering knowledge.

FastLane GRF APPLICATION MODULE

COMPONENTS

1. **PERSONAL INFORMATION:**
   a) CV: Education, Work and Other Experience
   b) Electronic Transcripts
2. PERSONAL, RELEVANT BACKGROUND, AND FUTURE GOALS STATEMENT
3. GRADUATE RESEARCH PLAN STATEMENT
4. NAMES AND EMAIL ADDRESSES OF REFERENCE LETTER WRITERS (at least two must be received for review; three is better)

* Five may be submitted, but only top three letters are considered

FORMAT & LENGTH LIMITATIONS

- **Standard letter size (8.5 x 11”), 1” margins, single spaced or larger**
- **12-pt Times New Roman**
  - **10-pt okay for refs, footnotes, figure captions & text**
- **The MAXIMUM LENGTH of the Personal, Relevant Background and Future Goals Statement is three (3) pages.**
- **The MAXIMUM LENGTH of the Graduate Research Plan Statement is two (2) pages. These page limits include all references, citations, charts, figures, images, and lists of publications and presentations.**

PERSONAL, RELEVANT BACKGROUND AND FUTURE GOALS (3 PAGES)

https://nsfgrfp.org/applicants/application_components

COMPONENTS

- **Your educational and professional development plans and career goals**
- **Your personal, educational and/or professional experiences with specific examples of research and/or professional activities.**
- **Separate sections and headings for INTELLECTIUAL MERIT and BROADER IMPACTS**
- **Address advancing knowledge in STEM fields, benefits to society, potential for leadership and global engagement**

PERSONAL ELEMENTS

- **Your fascination (passion) with research**
- **Your unique characteristics**
- **Your individual strengths**
- **Importance of GRF to your future**
- **Balance independence (initiative) and collaboration**
- **Narrative format**

GRADUATE RESEARCH PLAN (2 PAGES)

- **An original research topic** that you would like to pursue
- **Research idea, your general approach, and unique resources**
- **Limit to only important/relevant literature citations**
- **INTELLECTUAL MERIT AND BROADER IMPACTS: potential** of the research to **advance knowledge** and understanding within science AND the potential for **broader impacts on society**.
- The research discussed must be in a field listed in the Solicitation (Appendix X, Fields of Study).

DON'T FORGET

- **Excitement**
- **Your technical knowledge and skills** for conducting this work and **mentoring and training** to complete the study
- **Feasibility** in the allotted time and institutional resources
- The **"big picture"** importance of your research
- **Plan** of activities and tasks

NSF MANDATED REVIEW CRITERIA

"Both statements must address NSF's review criteria of Intellectual Merit and Broader Impacts (described in detail in Section VI). **Intellectual Merit and Broader Impacts must be addressed individually under separate headings in both Personal and Research Plan statements to provide reviewers with the information necessary to evaluate the application with respect to both criteria. Applications in which Intellectual Merit and Broader Impacts are not addressed separately under separate headings will be returned without review."** ***Program solicitation NSF 20-587***

IMPORTANT NEW INFORMATION FOR 2020 APPLICANTS

"Although NSF will continue to fund outstanding Graduate Research Fellowships in all areas of science and engineering supported by NSF, in FY2021, ***GRFP will emphasize three high priority research areas in alignment with NSF goals. These areas are Artificial Intelligence, Quantum Information Science, and Computationally Intensive Research. Applications are encouraged in all disciplines supported by NSF that incorporate these high priority research areas***." ***Program solicitation NSF 20-587***

There is a national petition signed by several thousand former GR fellows to protest this, but NSF did not change this new policy.

Consider incorporating ideas and/or methods from these areas into your research plan, e.g. AI-assisted STEM learning, computational biology.

- **INTELLECTUAL MERIT** encompasses the potential to **advance knowledge**
- **BROADER IMPACTS** encompasses the potential to **benefit society and contribute to achievement of SPECIFIC, desired societal outcomes**

INTELLECTUAL MERIT

- To what extent do the proposed activities suggest and explore **creative, original, or potentially transformative concepts**?
- Is the plan of activities **well-reasoned, well-organized and based on sound rationale**? Does the plan incorporate a **mechanism to assess success**?
- **How well qualified is the individual**, team, and/or organization to conduct the proposed activities?
- **Are adequate resources available to the PI** (at home institution or partners)?

BROADER IMPACTS

- **Broader impacts may be accomplished 1) through the research itself, 2) through the activities that are directly related to specific research projects, or 3) through activities that are supported by, but are complementary to, the project.**
- NSF values the advancement of scientific knowledge and activities that contribute to achievement **of societally relevant outcomes including, but not limited to:**
  - **FULL PARTICIPATION** of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM);
  - **improved STEM education** and educator development at any level;
  - **increased public scientific literacy and public engagement** with science and technology;
  - **improved well-being of individuals** in society;
  - development of a **diverse, globally competitive STEM workforce**;
  - **increased partnerships between academia, industry, and others**;
  - **improved national security;**
  - **increased economic competitiveness** of the US; and
  - **enhanced infrastructure for research and education**

REFERENCE LETTERS

- **Applications AIM FOR 3 REFERENCE LETTERS submitted through FastLane by the reference letter deadline: 4:00 PM EASTERN TIME, OCT. 30, 2020 (NO LATE LETTERS WILL BE CONSIDERED). TWO MUST BE SUBMITTED in order to be eligible for review. UP TO five reference letters may be requested, BUT ONLY THE TOP 3 (in order of applicant ranking) will be considered.**
- **Applicants must enter an appropriate email address for each reference writer in ranked order into the FastLane GRFP Application Module**. An exact email address is crucial to matching the reference writer and the applicant in the FastLane GRFP Application Module.
- **Applicants should ask reference writers well in advance of the reference writer deadline, and it is recommended they provide copies of their application materials to the writers.**

- **The REFERENCE LETTER should address the NSF Merit Review Criteria of Intellectual Merit and Broader Impacts. CONTENT should include**
  - **details explaining the nature of the relationship to the applicant,**
  - **comments on the applicant's potential for contributing to a globally-engaged United States science and engineering workforce,**
  - **statements about the applicant's academic potential and relevant prior experiences (re: PERSONAL STATEMENT),**
  - **statements about the applicant's proposed research (re: RESEARCH PLAN), and**
  - **any other information to aid review panels in evaluating the application according to the NSF Merit Review Criteria.**

- **FORMAT & LENGTH LIMITS:**
  - **FORMAT SAME AS APPLICANT'S STATEMENTS**
  - **MAXIMUM LENGTH IS TWO (2) PAGES, SINGLE SPACED**

Who Should be References?

- People who provide credible assessment of your potential for high-quality research – preferably in your chosen field
- Typically most are academics: research or project supervisors, teachers who know about your capacity for research, or supervisors of research-focused internships
- Supervisors of outreach activities (related to broader impacts) make a good addition
- Reference does not have to be current graduate research advisor
- People who are committed to reviewing your proposal and writing a thoughtful and specific letter addressing the criteria above
- (Suggesting highlights and talking points from your application can be a valuable aid your references.)

Date	Checklist
ASAP	Go to the GRFP website and make sure you are eligible Register on research.gov: **https://www.research.gov/grfp/Login.do** **Read the solicitation and applicant guidelines** Assemble transcript information and upload to research.gov (SAVE) Identify five references and contact them about writing letters Upload reference contact information to research.gov (SAVE) Include all publications, presentations, awards, fellowships, etc. in the "Other experience" box File a "DEPA" conflict of interest statement with your home office of contracts and grants Prepare outlines for personal statement and research plan Talk with your advisor(s) about your research plan and personal statement Draft research plan and personal statements. Be sure to identify and label IM and BI sections Circulate draft statements to advisor(s), fellow students and, if possible, a skilled writer. Edit statements accordingly.
October	Upload latest drafts of personal and research plan statements Continue editing uploading revisions and saving on research.gov Check to see if references are being submitted and ping references if necessary DO NOT WAIT UNTIL THE DUE DATE TO SUBMIT COMPLETE APPLICATION

FINAL WORDS

- ***Reviewers are rating your potential for independent research***. Do not submit a research plan statement that looks very similar to your advisor's research, which might appear in a reference letter.
- ***Get to know your references.*** As a new graduate student, you may not know them well, but you have over a month to interact with them to discuss and refine your ideas
- ***Write, read, rewrite, reread, rewrite…*** **no mistakes in grammar, spelling, good paragraphing**
- ***Have people (students, post-docs, faculty, and people with writing skills) read and give feedback***. Reviewers are probably not experts in your specific topic, but rather are knowledgeable about the Field and Subfield, and you don't need experts to review your personal statement.

- ***Engage reviewers quickly.*** GRF's are awarded based on the reviewers evaluation of your **potential** for both short- and long-term research contributions. ***Use a narrative structure***. Demonstrating how you develop an idea is key.
- ***Acknowledge uncertainties and describe challenges*** to be met – preferably with curiosity and excitement.
- ***Lead your reviewers through your statements.*** *Do not get bogged down* in specific details of technique. **AVOID jargon and undefined acronyms.** Use *italics*, **boldface**, <u>underline</u> to emphasize key points.
- ***Graphs and figures are good*****, but use sparingly – they take up space. Make sure figure text is legible (10 pt or larger)**
- ***Use citations sparingly***. The application is not a literature review. Cite only references to show how your research will advance the state of knowledge in your subfield.
- ***GOOD LUCK!***