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OUR MISSION

Since 1976, the National GEM Consortium has been addressing a critical shortfall in American engineering and scientific talent by increasing the participation of under-represented minorities at the Master's and Doctoral levels.

Our model is strategic and proven. We provide graduate Fellowships to highly qualified individuals from communities where such talent is largely untapped. Working in partnership with leading corporations, U.S. government laboratories and many of the nation's top universities and research institutes, we provide GEM Fellows with the much-needed financial support that is often the deciding factor in pursuing graduate education, as well as practical experience through high-level, paid summer Internships. GEM does more than provide financial support, however. We work to ensure student success in these competitive academic and professional environments with effective programs that increase the recruitment, retention and graduation of GEM Fellows. More than 3,000 GEM Fellows have gone on to successful careers.

ABOUT THIS SERIES

At the National GEM Consortium our core business is providing graduate Fellowships in engineering and science to highly qualified individuals from under-represented communities. We do this to address a critical shortfall in American engineering and scientific talent by recruiting from communities that are virtually untapped.

The number and percentage of U.S. citizens receiving postgraduate degrees in science, technology, engineering, and math (STEM) has been steadily declining for over two decades. Yet the need for qualified engineers and scientists has never been greater. Rewarding careers for individuals with Master's or Ph.D. degrees are plentiful. At GEM we believe that lack of information—not lack of opportunity—is the main reason more undergraduates don't pursue advanced degrees in engineering and science.

GEM designed its Getting Ready For Advanced Degrees (GRAD Lab) symposiums for students like you.

GEM's GRAD Labs help to demystify postgraduate education in science, technology, engineering, and math. They help you understand why graduate school presents a career advantage, how to pick a graduate program, how to apply, and how to pay for it. They help you make informed decisions about this crucial phase in your life.

This publication is one of three Guides that accompany GEM's GRAD Labs. These Guides provide a helpful summary and additional resource material.

Why Graduate School (GRAD Lab Guide One) discusses the value of advanced degrees and what will be required of you.

How to Apply To Graduate School (GRAD Lab Guide Two) explores the essentials needed to apply, gain admission to, and navigate the graduate school application process.

This Guide, **How to Fund Graduate School** (GRAD Lab Guide Three), helps you understand financing options, locate financial aid resources, and assess assistantship options.

You can also find the schedule and locations of an in-person or virtual GRAD Lab or request that one be presented in your area by visiting www.gemfellowship.org or calling 703-562-3646.

We hope this Guide helps make graduate school a reality for you!

THE NATIONAL GEM CONSORTIUM

Since 1976 the National GEM Consortium has been developing a pool of African-American, Hispanic-American and Native American talent in the fields of science, technology, engineering, and math (STEM). We are proud of the top-rated universities, renowned research facilities, and leading multinational corporations that comprise GEM.

Each year we identify and recruit more than 1,000 undergraduate students, graduate students, and working professionals for admission to advanced degree programs. Through three graduate Fellowship tracks—Master of Science in Engineering, Ph.D. in

Science, and Ph.D. in Engineering—we provide financial support and practical experience through paid summer Internships.

We also work to ensure success for our Fellows in these highly competitive academic and professional environments by providing programs through Member Universities.

The GEM Alumni Association, an influential network of more than 3,000 GEM Fellows, works to promote STEM education among America's under-represented populations and bring exciting career opportunities in science and engineering to all.

HOW TO FUND GRADUATE SCHOOL

Dr. Howard G. Adams—former executive director of GEM and an advocate for the democratization of America's graduate schools—used to tell students, “Graduate school in engineering and science is free!”

Dr. Adams was exaggerating only slightly. There are many ways to finance your graduate education in the STEM disciplines. Since Americans with advanced degrees in engineering and science are in high demand, you will find many avenues that make pursuing a graduate school education practical and affordable.

There are five primary funding options: Grants, Fellowships, research assistantships, teaching assistantships, and loans.

Grants

A Grant is generally money given to you as a one-time offering to accomplish a specific project and generally has no strings attached. For example, you apply for a travel Grant to attend a technical conference. Assuming you receive the Grant, you would then spend the money to attend the conference and that would exhaust the funds. Sometimes, if you are given Grant money and your expenses are less than the Grant amount, you will be required to return the unused portion of the funds.

Fellowships

A Fellowship is comparable to an undergraduate Scholarship. Fellowships are typically awarded to pursuers of graduate or doctoral degrees. Although providers don't seek repayment, they will frequently ask that students perform research work as a part of the Fellowship. It is not uncommon for stipends, in addition to tuition coverage, to be a part of a fellowship package. Fellowships are generally awarded on merit after a competitive process.

Fellowships can be particularly valuable during your first year of graduate school. The first year of a graduate program often requires the most of students, and you may feel that you are being “stretched” to the limit. A Fellowship will provide you with the maximum amount of time for study, given an assistantship is usually a minimum of 20 hours per week.

For example, the National GEM Consortium provides three types of Fellowships to assist students under-represented in postgraduate scientific and engineering programs: M.S. Engineering Fellowships, Ph.D. Engineering Fellowships, and Ph.D. Science Fellowships. The GEM Fellowships are portable. A winning student may take his or her Fellowship to any of the more than 100 University Members of

the Consortium that accepts the student's application.

You can find more about the GEM Fellowships as well as information on a large variety of other fellowships below. What's the difference between Grants, Scholarship, and Fellowships?

There is very little difference in practice, and the terms are sometimes used interchangeably. There are a few minor technical distinctions: Grants are the most inclusive, representing any Grant of money in exchange for a prescribed purpose. Scholarships usually refer to Grants in support of undergraduate education, and Fellowships usually refer to Grants in support of post-Baccalaureate projects, or to pre-Baccalaureate projects pursued outside the normal curriculum. All Scholarships and Fellowships are Grants.

Research Assistantships

After your first year as a graduate student, you may find it beneficial to create more of a presence for yourself in your department while continuing to fund your education. Two ways to do this are by serving as a Teaching Assistant (TA) or Research Assistant (RA).

As a Research Assistant, you are paid to assist a professor on an experiment or research project. You will also probably receive a stipend for living expenses. Serving as an RA allows you to contribute original research as you continue your studies—a big part of the graduate school experience.

Teaching Assistantships

As a Teaching Assistant, you are paid to teach, conduct a lab, or help grade papers and exams. TAs often are responsible for presenting the recitation or discussion section of a particular course, providing the students with solution sets to assigned homework problems, or grading midterms, finals, and homework.

Although this work is demanding, it can provide you with the benefit of concentrating on a particular topic for an entire semester. In fact, it is not unusual for advisors to recommend that students TA in a subject in which they may be weak. Ph.D. programs often contain a teaching requirement.

Teaching also allows you to assist undergraduates in your chosen field of study—an experience that is rewarding in its own right.

Loans

With Fellowships and assistantships widely available, borrowing money to finance a graduate education should be considered your last resort. Loans may be useful to ease the transition for a student returning to school after years in the workforce, since stipends rarely approach the amount of a full-time salary. In any case, loans frequently can be arranged so that no repayment begins until after postgraduate education is complete.

Evaluating Your Options

Your funding may vary from term to term during your tenure as a graduate student. While a Fellowship may prove best during your challenging first semesters at graduate school, taking on the additional responsibilities of a research or teaching assistant-

ship may suit your changing role and development as a graduate student.

For example, you may enjoy a Fellowship for your first year, serve as an RA in your second and third years, become a TA in your fourth year, and then serve as an RA in your final year. Make sure to research your options and take advantage of the financial assistance that is available.

The most important thing is to realize that a postgraduate degree in science, technology, engineering, or math will place you in high demand. There is a way to fund graduate school that is right for you.

FOR MORE INFORMATION

The following are valuable sources of general information on financial aid for graduate education:

- www.gemfellowship.org—The National GEM Consortium offers the largest number of Fellowships/Internships for under-represented students for Master's and Ph.D. degrees in engineering and science.
- www.collegesource.org—A database with course catalogs and institutional mission statements.
- www.gradschools.com—A comprehensive online resource of current graduate school information and listings.
- www.petersons.com—A thorough web site that includes specific campus information and standardized test information.
- www.nsf.gov—Search for and participate in Research Experiences for Undergraduates (REU) to gain valuable research experience through the National Science Foundation.
- www.finaid.org—A comprehensive financial aid web site.
- The graduate office at your university.
- The graduate offices at universities of interest to you.
- The department in which you plan to pursue your degree.

THE GEM FELLOWSHIP PROGRAM

The GEM Consortium offers three Fellowship Programs portable only to GEM Member Universities (a list of GEM Universities can be found at www.gemfellowship.org > Universities > University Members). The total value of these Fellowships is between \$20,000 and \$100,000, depending on the candidate's academic status at the time of application, paid summer employment and graduate school costs.

Master of Science in Engineering Fellowships

This program promotes the benefits of a Master's Degree for careers in industry. Fellows receive a living stipend, paid summer Internship(s) with a participating GEM Employer-Sponsor for practical engineering experience, and full tuition and fees at any GEM Member University where the Fellow has been admitted.

Ph.D. in Engineering Fellowships

GEM offers Doctoral Fellowships to under-represented students who have either completed or are currently enrolled in a Bachelor's in Engineering program. During the first academic year following selection, the GEM Consortium pays a living stipend, tuition and fees and a Cost of Instruction Grant to the institution where

the Fellow is enrolled. Up to the fifth year of the Doctoral program, the total Fellowship cost is borne by the participating GEM Member University through an awards package similar to that offered to other funded graduate students in this department. Fellows are provided a practical summer work experience through the GEM Employer-Sponsor for the summer after selection. All Fellows must accept a research or teaching assistantship at his or her Member University after the first year.

Ph.D. in Science Fellowships

This program seeks to increase the number of under-represented students who pursue Doctoral Degrees in the natural science disciplines, i.e. chemistry, physics, earth sciences, mathematics, biological sciences, and computer science. During the first academic year following selection, the GEM Consortium pays a living stipend, tuition and fees, and a Cost of Instruction Grant to the institution where the Fellow is enrolled. Up to the fifth year of the Doctoral program, the total Fellowship cost is borne by the participating GEM Member University through an awards package similar to that offered to other funded graduate students in this department. Fellows are provided a practical summer work experience through the GEM Employer-Sponsor for the summer after selection. All Fellows must accept a research or teaching assistantship at his or her Member University after the first year.

Internship Requirement

GEM Fellows are required to accept approximately 12 weeks of a paid Internship with a Member Employer-Sponsor the summer immediately following selection. Fellows are paired with Employer-Sponsors who have specified their intern preferences, and accepting the assignment confirms the Fellowship. The Fellowship does not obligate the student or Employer-Sponsor to full-time employment beyond the student's completion of the program.

The employer decides the summer internship assignment and location. Every effort is made to match a student's research interests to the internship assignment.

Graduate School Admission

Applicants must agree to apply to graduate school at a minimum of three GEM Member Universities. Fellows are responsible for all graduate school application expenses. Each Member University has its own admission requirements and students are accepted on their own merits. In addition, Member Universities may have additional requirements for accepting GEM Fellows; for example, obtaining in-state residency or acceptance of a teaching or research assistantship in order to receive tuition-fee support and stipend supplements. Be sure to check with the GEM representative at all graduate schools of interest. Students are strongly encouraged to apply simultaneous with application to the GEM program, but no later than the Universities' application deadlines. Applicants must be admitted into a GEM Member University graduate program before the GEM Fellowship is awarded.

See www.gemfellowship.org for additional details on the GEM Fellowship Program, a list of Member Universities, a list of Member Employers, and more.

OTHER FELLOWSHIP PROGRAMS

Note: The goal of this section is to highlight there are a number of fellowship opportunities available for those who wish to pursue a graduate degree in STEM. This sort of information changes frequently. If you are interested in any of the following, we suggest you check the specifics on the organizations website. Please also search on-line for your specific field and degree of interest to find fellowships applicable to your profile.

[American Society of Naval Engineers Scholarship \(MS\)](https://www.navalengineers.org/students/scholarships/Pages/ASNELandingPage.aspx)

<https://www.navalengineers.org/students/scholarships/Pages/ASNELandingPage.aspx>

Annual awards value between \$3,000 and \$4,000

[Department of Energy Computational Science Graduate Fellowship \(PhD\)](http://www.krellinst.org/csgf/)

<http://www.krellinst.org/csgf/>

Annual awards with a value up to \$ 32,400

[Electrochemical Society Summer Fellowships \(PhD\)](http://www.rff.org/About_RFF/Pages/JosephLFisherDoctoralDissertationFellowships.aspx)

[http://www.rff.org/About_RFF/Pages/](http://www.rff.org/About_RFF/Pages/JosephLFisherDoctoralDissertationFellowships.aspx)

[JosephLFisherDoctoralDissertationFellowships.aspx](http://www.rff.org/About_RFF/Pages/JosephLFisherDoctoralDissertationFellowships.aspx)

Annual awards with an average value of \$5,000

[Environmental Protection Agency \(EPA\) Science to Achieve Results \(STAR\) Fellowship \(PhD\)](http://www.epa.gov/ncer/rfa/)

<http://www.epa.gov/ncer/rfa/>

\$37,000 per year per fellowship

[Environmental Public Policy and Conflict Resolution PhD \(PhD\)](http://www.sname.org/membership1/studentmembership/scholarships)

<http://www.sname.org/membership1/studentmembership/scholarships>

Annual awards with a value of \$24,000

[Ford Foundation Fellowship Programs \(PhD\)](http://sites.nationalacademies.org/pga/fordfellowships/index.htm)

<http://sites.nationalacademies.org/pga/fordfellowships/index.htm>

Awards varies between \$20,000 and \$ 40,000 annual

[Geological Society of America Research Grants \(MS/PhD\)](http://www.geosociety.org/grants/gradgrants.htm)

<http://www.geosociety.org/grants/gradgrants.htm>

Annual awards approximately 302 grants (geological sciences)

[Goldwater Science Scholarships \(PhD\)](https://goldwater.scholarsapply.org/)

<https://goldwater.scholarsapply.org/>

A maximum value of \$7,500 awarded Annual

[Hertz Fellowship \(PhD\)](http://www.hertzfoundation.org)

<http://www.hertzfoundation.org>

Annual stipend of \$31,000 (up to 5 years) or \$36,000 (up to 2 years)

Fields: Physical, biological and engineering sciences.

[Marshall Scholarships \(PhD\)](#)

<http://www.igert.org/>

Annual awards for two academic years. Fellowship award includes: university fees and expenses.

[NASA Aeronautics Scholarship Program \(PhD\)](#)

https://www.nasa.gov/offices/education/programs/descriptions/NASA_Aeronautics_Scholarship_Program.html#.Vakrt_nwM3Q

Annual awards with a value up to \$35,000

[NASA Graduate Research Fellowships \(PhD\)](#)

<http://fellowships.hq.nasa.gov/gsrp/login/guideline.cfm>

Annual awards varies

[NASA Harriet Jenkins \(PhD\)](#)

http://www.nasa.gov/offices/education/programs/descriptions/Jenkins_Predocctoral_Fellowship_Project.html#.VbD_zPnwM3Q

Fellowships start at \$24,500

[National Defense Science and Engineering Graduate \(NDSEG\) Fellowship \(PhD\)](#)

<http://ndseg.asee.org/>

\$30,500 awarded Annual

[National Physical Science Consortium \(NPSC\) Fellowship \(MS/PhD\)](#)

<https://www.npsc.org/>

Annual awards \$21,000, two to three years, though it can be extended up to six years

[NSF Grad Research Fellowships \(MS/PhD\)](#)

<https://www.nsfgrfp.org/>

Annual awards \$34,000 financial support within a five-year fellowship period

[Rhodes Scholarship \(MS/PhD\)](#)

<http://www.rhodesscholar.org/>

Annual multiple scholars/tuition and lab fees, travel to and from Oxford University with a stipend.

[Robert E. Thunen Memorial Scholarship \(BS, MS\)](#)

<https://vtol.org/education/vertical-flight-foundation-scholarships>

Annual awards two scholarships with a value of \$2,500 must be attending a college in Northern California, Nevada, Oregon, or Washington

[Ruth L. Kirschstein National Research Service Awards for Individual Predocctoral Fellowships to Promote Diversity in Health-Related Research \(PhD\)](#)

<http://www.nhlbi.nih.gov/research/training/programs/predocctoral/nrsa-diversity-parent-f31>

Annual awards \$20,772

[Ruth L. Kirschstein National Research Service Awards for MD/PhD Fellowships \(MD/PhD\)](#)

<http://www.nhlbi.nih.gov/research/training/programs/predoc>

[toral/nrsa-md-phd-parent-f30](http://www.nhlbi.nih.gov/research/training/programs/predocctoral/nrsa-md-phd-parent-f30)

Annual awards \$20,772

[Science, Mathematics, and Research for Transformation Defense Scholarship for Research Program \(SMART\) \(MS, PhD\)](#)

smart.asee.org

Annual cash award rate between \$25,000 and \$41,000

[Sloan Fellowships \(PhD\)](#)

<http://sloanphds.org/>

Annual awards varies

[The Raymond Davis Scholarship \(BS/MS\)](#)

<http://www.imaging.org/ist/membership/davis.cfm?AwardCode=RS>

Annual awards one or more awards of \$1,000 (Full-time student: engineering, imaging science, photographic science)

[The Society of Naval Architects and Marine Engineers Graduate Scholarship \(MS\)](#)

<http://www.sname.org/membership1/studentmembership/scholarships>

Annual multiple awards with a value up to \$20,000

[U.S. Department of Energy – Computational Science Graduate Fellowship \(PhD\)](#)

<http://www.krellinst.org/csgf/>

Renewable fellowships up to \$36,000 per year

[U.S. Department of Energy Global Change Program \(GREF\) \(PhD\)](#)

<http://gcep.host.ualr.edu/>

Annual awards \$19,200 (three year appointments/renewed Annual)

Fields: biological sciences, biological engineering, physics, or astronomy.

[Vertical Flight Foundation Scholarship \(BS,MS, PhD\)](#)

<https://vtol.org/education/vertical-flight-foundation-scholarships>

Annual awards stipends from \$1,000 to \$4,000 depending upon endowment earnings

[Whitaker Foundation Graduate Fellowships in Biomedical Engineering \(PhD\)](#)

<http://www.whitaker.org/>

Annual awards with a value up to \$25,000

DON'T LET MONEY HOLD YOU BACK

With our country facing a shortage of professionals to fill STEM positions in our corporations and universities, now is a perfect time to pursue a graduate degree in the STEM disciplines. There are more resources available today than ever that can help you go to school for free. All you need to do is a little research. Starting today you can turn

[†] Indicates a fellowship weighted to or specifically for at least one underrepresented minority group.

LINKING EXCEPTIONAL TALENT TO EXTRAORDINARY CAREERS

