



Communicator

Council of Graduate Schools

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CGS Announces Grant from the National Science Foundation

The Council of Graduate Schools has received a grant from the National Science Foundation (NSF) to fund Ethics Education in Science and Engineering programs at eight of its member institutions to develop interdisciplinary research-ethics programs for graduate students. This project will build upon an existing CGS initiative, funded by the Office of Research Integrity (ORI), in which ten institutions were given awards to develop training programs in the responsible conduct of research (RCR) for graduate students in the behavioral and biomedical sciences. The new NSF-funded project will incorporate and expand what is being learned in that initiative.

Through the new NSF project CGS hopes to make training of graduate students in RCR a regular feature of graduate education. The project will advance this goal by adding students in science and engineering to the cohort of students currently being reached by CGS-supported RCR projects. This new cohort of students will be required not just to understand the professional standards of their disciplines, but to recognize, articulate, and deliberate ethical issues that arise in interdisciplinary research and in public-policy arenas. Assessment strategies for the new project will include measurement both of individual ethical development and of the ethical climate of the research units involved.

Institutions applying for, but not receiving, CGS/NSF awards will be invited to join the project as “affiliates” and will be encouraged to participate in the regular sessions at CGS meetings on RCR education and in discussions on the CGS/RCR listserv. CGS will publish a monograph about best practices in RCR education in the spring of 2006. It hopes to revise and expand that monograph in

subsequent years, as more institutions implement ethics education programs on their campuses and share their experiences with CGS and its members.

Only deans and/or associate deans of graduate schools will be eligible to apply for the awards, and will be required to serve as PI's and as leverage points for the development and implementation of the programs on their campuses. Deans from institutions currently funded under the CGS/ORI demonstration project will be encouraged to apply. An RFP has been sent to member deans and can be found on the RCR webpage, which is linked from the CGS home page. Applications will be due August 15, 2006. CGS will conduct a technical workshop explaining the importance of RCR training and clarifying the criteria in the RFP at the 2006 Summer Workshop in Cambridge, MA. The session will be held Wednesday, July 12 from 9:00 am - 12:00 pm.

For information contact Paul Tate or Helen Frasier

INSIDE

| | |
|--|-------|
| Data Sources | 2,3,7 |
| Revised GRE General Test Launch | 4 |
| Examples of Excelencia Awards Announcement | 4 |
| Government Relations Update | 5,6 |

Data Sources: Recent Reports on Graduate Education Trends

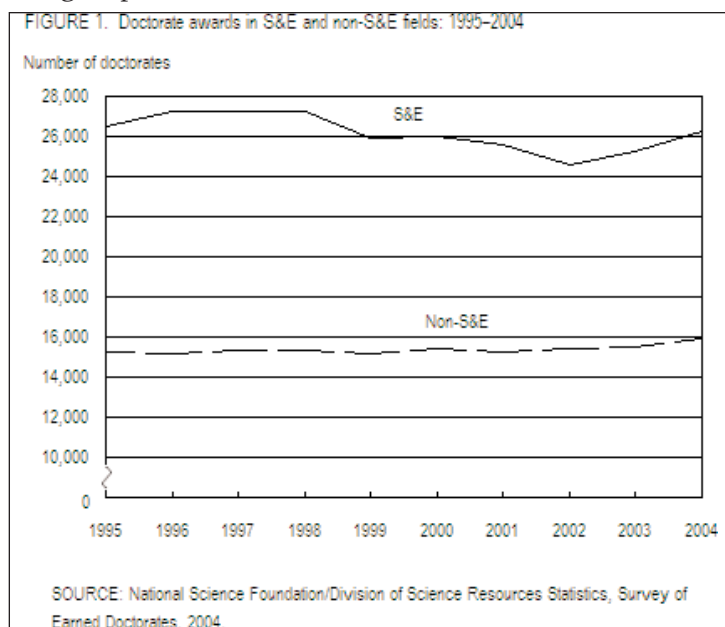
The CGS/GRE Survey of Graduate Enrollment and Degrees contributes to a national understanding of graduate trends, particularly as related to overall graduate enrollment, graduate degree production, and graduate admissions. Data collection and analysis conducted by the Department of Education, National Science Foundation, and others deepens our knowledge of graduate education. Two new Info Briefs from the National Science Foundation in particular add to our understanding of graduate trends.

Doctoral Degrees

A recent Info Brief by Susan Hill from the NSF focuses on current trends in doctoral production. The Info Brief draws on data from the 2004 Survey of Earned Doctorates (SED) which NSF conducts in partnership with the National Opinion Research Center (NORC). Typically, findings from the SED track closely with the CGS/GRE Survey, though the CGS/GRE Survey collects data on certain professional doctorates which are typically not counted as a part of the SED due to its exclusive focus on

research doctorates. The SED collects other information which the CGS/GRE Survey does not, such as the demographic characteristics of doctoral degree recipients, along with information about the student's doctoral experience and post-graduation plans.

In 2004, NSF reports 42,155 total doctorates awarded; an increase of approximately 1% from 1995. Of all doctoral degrees, 26,275 were awarded in science and engineering, up from last year, but still down from the all-time highs in the mid-1990s (See Figure 1).



Graduate programs in the biological sciences saw some of the largest increases, conferring 5,937 degrees, the highest total in recent history. Non-science and engineering doctoral production has remained relatively constant over the last decade.

The Info Brief shows that women received a larger portion of doctorates in 2004 with 45% earned versus 39% in 1995. Underrepresented racial/ethnic minorities also earned a larger percentage of doctorates in 2004 (12%), than in 1995

(9%). International students earned approximately the same percent of doctorates in 2004 (33%), as in 1995 (32%). Despite these positive signs, underrepresentation persists in many fields and graduate education in general for many demographic groups.

The Info Brief further highlights *continued on next page*

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Data Sources

particular trends for the field of physics. Physics graduate programs have large numbers of international students. In fact, over 50% of physics doctorates were awarded to non-US citizens in 2004. The field of physics has also seen the most notable decreases in doctoral production. Overall, physics doctorates are down 20% between 1995 and 2004 and down 33% for US citizens. US citizen males earning physics doctorates have decreased 35% while US citizen women have decreased 14%. International doctorates in physics have also declined, 11% overall, with 30% from China, 24% from India, 58% from Korea, and 67% from Taiwan.

For more information, please see:
<http://www.nsf.gov/statistics/infbrief/nsf06301/>.

Employment Outcomes

Another NSF Info Brief by John Tsapogas focuses on the career outcomes of recent graduates at the bachelor's and master's levels. Data for this Brief comes from the National Science Foundation's 2003 National Survey of Recent College Graduates (NSRCG). Data were collected between October 2003 and June 2004 and included bachelor's and master's graduates who received science, engineering, or health degrees between July 1, 2000 and June 30, 2002.

Table 1 shows that students in engineering, at the bachelor's and master's level, are more likely to be employed in careers in engineering, sciences, or health, than students in the sciences. Sixty-four percent of full-time employed students earning master's degrees in engineering are working in engineering, science, or health related jobs, while only 36% of students earning master's in the sciences are working in directly related jobs. In comparison, 87% of students earning master's degrees in health-related fields are employed in similar jobs. Some of this difference may be related to the longer tradition of students in engineering earning

TABLE 1. S&E bachelor's and master's degree recipients in 2001 and 2002 employed in science, engineering, or health jobs, by field of degree: 2003

| Field of degree | (Percent of employed graduates) | |
|--|---------------------------------|----------------------------|
| | Bachelor's degree recipients | Master's degree recipients |
| All fields | 17 | 31 |
| Science | 13 | 36 |
| Biological, agricultural, and environmental life sciences | 14 | 44 |
| Computer and information sciences | 46 | 50 |
| Mathematics and statistics | 16 | 46 |
| Physical and related sciences | 24 | 50 |
| Psychology | 5 | 29 |
| Social and related sciences | 6 | 17 |
| Engineering | 60 | 64 |
| Aerospace and related engineering | 58 | 73 |
| Chemical engineering | 57 | 47 |
| Civil and architectural engineering | 77 | 78 |
| Electrical, electronic, computer, and communications engineering | 60 | 61 |
| Industrial engineering | 52 | 62 |
| Materials/metallurgical engineering | S | S |
| Mechanical engineering | 58 | 67 |
| Other engineering | 51 | 60 |
| Health | 88 | 87 |

S=data suppressed because of the small number of survey respondents used to generate the population estimate for this cell.

NOTE: Employed graduates include full-time and part-time employed graduates and exclude graduates who were full-time students on the reference date of the survey, October 1, 2003.

SOURCE: National Science Foundation/Division of Science Resources Statistics, National Survey of Recent College Graduates: 2003.

master's degrees. In other science fields, the master's degree has not played the prominent role it has in engineering. The emergence of the professional master's science degree is partially a response to this situation. It is important to note that students who are full-time students, meaning a bachelor's degree or master's degree earner who is pursuing a doctoral program, is not included in this data report.

An important related question is: in which sectors do master's graduates work? Overall, the largest percentage of master's graduates pursue jobs in the private sector, 58%, while 28% are employed in jobs in the education sector and 14% in government (See Table 2). The differences between engineering and sciences are quite notable. Thirty-eight percent of those students earning master's degrees in the sciences pursue jobs in government compared to 21% of engineering master's students. Similarly, 15% of science master's graduates pursue jobs in government compared to 8% of engineering master's graduates.

For more information, please see:
<http://www.nsf.gov/statistics/infbrief/nsf06303/>.

The findings from this Info Brief provide useful information on career outcomes for certain graduate students, however these findings are clearly limited. A more in-depth understanding of career *continued on page 7*

TABLE 2. Employed 2001 and 2002 science, engineering, or health bachelor's and master's degree recipients, by sector of employment and field of degree: 2003(Percent distribution)

| Degree and field | Employed ^a (thousands) | Employment status | | Sector of primary full-time employment | | | |
|------------------|--------------------------------------|-------------------|-----------|--|---------------------------------------|-------------------------|---|
| | | Full time | Part time | All sectors | Educational institutions ^b | Government ^c | Private for-profit company ^d |
| | | | | | | | |
| Master's | 186,600 | 86 | 14 | 100 | 28 | 14 | 58 |
| All sciences | 80,200 | 82 | 18 | 100 | 38 | 15 | 47 |
| All engineering | 33,700 | 88 | 12 | 100 | 21 | 8 | 71 |
| Health | 72,700 | 90 | 10 | 100 | 21 | 15 | 64 |

^aExcludes full-time students.

^bEducational institutions include elementary and secondary schools, 2- and 4-year colleges and universities, medical schools, university-affiliated research organizations, and all other educational institutions.

^cGovernment includes local, state, and federal government, military, and commissioned corps.

^dPrivate industry and business include all private for-profit and private not-for-profit companies, businesses, and organizations, except those reported as educational institutions. It also includes persons reporting self-employment.

NOTE: Detail may not add to total because of rounding.

SOURCE: National Science Foundation/Division of Science Resources Statistics, National Survey of Recent College Graduates: 2003.



Examples of Excelencia is a new national initiative offered by Excelencia in Education and designed to identify, celebrate and promote models, programs, and institutional departments that significantly contribute to improving educational achievement for Latino students in higher education.

The competition is now open and will run until April 15 with nominations accepted online. This year programs and departments showing evidence of accelerating Latinos student achievement at the following levels are encouraged:

Community Colleges
Baccalaureate Institutions
Graduate Institutions

2006 Examples of Excelencia will receive \$5,000 each and will be honored at the Excelencia symposium (to be held in conjunction with the National College Access Network Conference in September in Orlando) and will be publicized nationally throughout the year.

More information about the initiative (including last year's recipient, UT Austin's Math Department) can be found at www.EdExcelencia.org

The Revised GRE® General Test Launch in Fall 2007

In the November 2005 *CGS Communicator* we described the major changes being made for the revised Graduate Record Examinations® (GRE®) General Test. Here we would like to share with CGS members the factors behind the recent decision to delay the launch of the revised General Test one year until the fall of 2007.

The GRE Board and the GRE Program are committed to a seamless transition from the current GRE General Test to the revised test. The revised GRE General Test will involve, among other things, changes in the content of the Verbal Reasoning and Quantitative Reasoning sections, new score scales for the Verbal and Quantitative sections, a new linear testing format, and a new Internet-based testing (iBT) delivery network, which is being developed to deliver ETS tests such as TOEFL® and GRE. The new network will permit many universities to once again administer the GRE and other tests on their campuses. Each of these changes is in itself a major undertaking, and in combination they represent significant operational and statistical challenges.

In order to manage the many changes required to make the launch of the revised General Test flawless, it is critical that the GRE Program have the opportunity to learn from our experiences launching the TOEFL iBT before launching the revised GRE General Test. It should also be noted that a phased-in rollout similar to the TOEFL iBT (where the introduction of the test varied for different countries) is not possible for the revised GRE General Test, primarily because a large representative group of test takers is needed in order to set the new Verbal and Quantitative score scales when the test is launched.

In February 2006, the GRE Board passed unanimously a resolution supporting the decision to delay the launch until the fall of 2007. The Board has confidence that the new test and this decision to delay its initial use will benefit the graduate community. In the interim, ETS will continue to deliver the GRE General Test using the current network of secure, proctored test centers. We will continue to update the graduate community as we move forward.

David Payne, Executive Director, GRE Program Educational Testing Service and Kurt F. Geisinger, Chair, GRE Board, University of Saint Thomas, Houston

Government Relations Update

After a series of reports in the last year issuing calls to action on economic competitiveness, a number of innovation-related bills have been introduced in Congress, and the message has been received in the White House. The president announced an American Competitiveness Initiative in his State of the Union address and included funding for it in the administration's budget proposal for fiscal year 2007. To complement the updates CGS has provided in the Government Relations Weekly Update, this article summarizes the president's initiative, his proposed federal budget, and innovation-related legislation of interest to the graduate education community.

American Competitiveness Initiative

During his State of the Union address on January 31, President Bush announced an "American Competitiveness Initiative" (ACI) to encourage innovation, entrepreneurship, and promote math and science education. The initiative has three parts. First, it would double, over 10 years, the federal commitment to basic research. It targets programs in the physical sciences within the National Science Foundation (NSF), the Energy Department's Office of Science, and the Commerce Department's National Institute of Standards and Technology (NIST). Second, ACI would make permanent the federal R&D tax credit. Third, it would fund the training of 70,000 high school teachers to lead Advanced Placement courses in math and science and 30,000 math and science professionals to become adjunct teachers. ACI is expected to cost \$136 billion over 10 years, including \$50 billion in new funds.

ACI does not include any specific graduate education programs, although one of its goals is to produce 10,000 more scientists, students, post-doctoral fellows, and technicians, including 6,400 via NSF programs. CGS has released a statement, available on our website, supporting the ACI, with a reminder about the importance of educating highly-skilled researchers.

Fiscal Year 2007 Federal Budget Research

President Bush's fiscal year 2007 (FY07) budget proposal implements the first year of his American Competitiveness Initiative. For the year beginning October 1, the president requests a \$910 million combined increase for NSF, Energy's Office of Science, and NIST. This is a considerable improvement over last year. However, the National Institutes of Health (NIH) would see no budget increase, after having its budget doubled between 1998 and 2003.

Graduate Programs

NSF: Graduate fellowship and traineeship programs would fare well, in general, under the president's budget. NSF's three graduate education programs—Graduate Research Fellowships (GRF), Integrative Graduate

Education, Research Traineeships (IGERT) and Graduate Teaching Fellowships in K-12 Education (GK-12)—are each slated for increases of 3.1% to 4.9%. An estimated 4,665 graduate fellow and trainees would be supported, and stipends would be maintained at the current amount of \$30,000. Programs aimed at broadening participation in science and engineering, such as the Alliances for Graduate Education and the Professoriate (AGEP), would increase by 24%, or \$16.15 million.

NIH: The Ruth L. Kirschstein National Research Service Award (NRSA) program would be level-funded for FY07, supporting roughly 17,500 traineeships.

Education: Unfortunately, the budget proposal for the Department of Education calls for a 5.5% decrease from current funding for discretionary spending and would eliminate 42 programs, including two TRIO programs, Talent Search and Upward Bound. In this context, the level funding proposed for Graduate Assistance in Areas of National Need (GAANN), Javits Fellowships, and the McNair Postbaccalaureate Achievement program are notable. Still, these programs have not seen budget increases in several years. The budget does propose a new Advancing America Through Foreign Language Partnerships Program, which would support advanced language learning at the postsecondary level.

State: The State Department's proposed budget for FY07 includes \$474 million for educational and cultural exchange programs, an increase of \$42 million, including \$17 million more for Academic Programs.

EPA: The president has proposed cutting the Environmental Protection Agency's (EPA) Research Fellowship program 28%, to \$8.4 million. The president had proposed cutting this program similarly last fiscal year, but Congress restored appropriations to 2005 levels.

Defense: The president has proposed continued growth for the National Defense Education program in the Defense Department (previously referred to as "NDEA Phase I"), almost doubling its budget from \$10.1 to \$19.5 million.

Energy: While the Energy Department's budget does not specify funding of fellowships, the budget increase is likely to increase the number of research assistantships available to graduate students, post-docs, and PhDs by approximately 2,600. Please see the chart on the following page for proposed appropriations for specific programs.

PACE Act

The "Protecting America's Competitive Edge" (PACE) Act is a bipartisan package of three bills to implement the recommendations of the National Academies' Rising Above the Gathering Storm report. It was introduced in late January by the two senators who had initially charged the Academies with developing recommendations on competitiveness, Lamar Alexander (R-TN) and Jeff Bingaman (D-NM), and by Senators Pete Domenici (R-NM), and Barbara Mikulski (D-MD). A majority of senators, from both parties, have signed on as co-sponsors for all three bills (S. 2197- S. 2199).

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Government Relations Update

Overall, the PACE Act would nearly double funding, in seven years, for research programs in NSF and the Department of Energy, and would require funding of \$9 billion in 2007. There are a number of graduate education-related provisions in the legislation, which would:

- Create 5000 graduate research fellowships in science, mathematics, engineering, and technology (STEM) fields;
- Provide grants to university STEM departments that partner with teacher-preparation programs to develop master's degree programs in math and science education for current teachers;
- Provide \$10,000 a year, for up to five years, to teachers who have completed a graduate degree in math or science education and who undertake increased responsibilities;
- Exempt basic research at universities from deemed export controls;
- Create a new visa category specifically for doctoral students in STEM fields;
- Exempt foreign workers, who have advanced degrees in a STEM field and have been working in a related field in the US during the preceding three years, from immigration caps.

Since the Senate Energy and Education committee chairs have expressed support for the bills, committee hearings and markups are expected in early spring. While similar initiatives have been introduced in the House, identical PACE Act legislation has not been introduced yet. CGS enthusiastically supports the PACE Act, and is working in a coalition to help move this legislation through Congress. Our statement commending the sponsors is posted on our website.

National Innovation Act

Senators John Ensign (R-NV) and Joseph Lieberman (D-CT) led a bipartisan group in introducing the "National Innovation Act" (S. 2109) in December. Similar to the PACE Act, the NIA would increase the federal investment in basic research, address the science and technology workforce, and promote innovation. It would double federal funding, over five years, for basic research in NSF and NIST programs. Provisions of the bill of particular interest to the graduate education community include those which would:

- Expand NSF's Graduate Research Fellowship program by 250 fellows a year for five years, and extend the length

of each fellowship to five years;

- Expand NSF's Integrative Graduate Education and Research Traineeship (IGERT) program, also by 250 traineeships per year over five years;
- Create NSF grants to establish Professional Science Master's Degree programs at up to 200 colleges and universities;
- Extend the Science, Mathematics, and Research for Transformation (SMART) program in the Defense Department for five years, and authorize \$41 million/year over 5 years to support additional doctoral and master's students in relevant fields;
- Expand the National Defense Science and Engineering Graduate Fellowship program to additional participants, at a level of \$45 million/year over 5 years;
- Create competitive traineeship programs for students in STEM fields, focusing on innovation-oriented studies, multidisciplinary studies and laboratory research. Up to 30 doctoral candidates and 30 master's students would be sponsored.

The bill also expresses the "sense of the Senate" that the US should retain highly-skilled foreign workers who have advanced degrees in STEM fields from US institutions. Companion legislation has not yet been introduced in the House. CGS sent letters of support, which have been posted on our website, to both sponsors.

The CGS Government Relations Weekly Update will provide regular updates on both the budget and all legislation of interest.

by Stuart Heiser, Manager of Government Relations and Public Affairs

| <i>(Appropriations in \$ millions)</i> | FY 2005 Final | FY 2006 Final | FY 2007 Proposed |
|--|--------------------------|--------------------------|-----------------------------|
| National Science Foundation | | | |
| Integrative Graduate Education and Research Traineeships (IGERT) | 24.50 | 24.40 | 25.00 |
| Graduate Research Fellowships | 88.47 | 87.70 | 88.70 |
| Graduate Teaching Fellowships in K-12 | 41.73 | 41.40 | 47.00 |
| National Institutes of Health | | | |
| National Research Service Awards (NRSA) | 762.00 | 756.40 | 756.40 |
| Department of Education | | | |
| GAANN | 30.40 | 30.10 | 30.10 |
| Javits | 9.80 | 9.70 | 9.70 |
| Fulbright-Hays Doctoral Research Abroad | 2.20 | 2.18 | 2.18 |
| Foreign Language and Area Studies | 29.20 | 27.90 | 29.20 |
| McNair Postbaccalaureate Achievement | 42.00 | 42.00 | 42.00 |
| Department of State | | | |
| Fulbright Grants for Graduate Study and Research Abroad | 204.00 | 238.30 | 258.00 |
| Environmental Protection Agency | | | |
| General fellowships | 12.04 | 11.70 | 8.40 |
| Department of Defense | | | |
| National Defense Education Program | 2.50 | 10.10 | 19.50 |

continued from page 3
Data Sources

outcomes would include a fine-grained analysis of the relationship between the skills graduate students acquire and the jobs they get. For instance, we should better understand the extent to which students, who obtain jobs in business or management, rely on their graduate background in science or engineering. Career movement between sectors and fields is a related and important dimension of post-graduate school careers. To this point, CGS's Professional Science Master's project has as a goal the collection of more complete and detailed information on career outcomes for professional science master's graduates. Additionally, inherent in the PhD Completion Project is a recognition that better information on doctoral student outcomes, including career placements, could help make the process of doctoral education more transparent and, perhaps, more effective in the long run.

by Heath Brown, Director of Research and Policy Analysis

Editor's Note

CGS is changing its look. Premiering in March 2006:

The newly designed
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and
the launch of the re-designed
CGS website at www.cgsnet.org.

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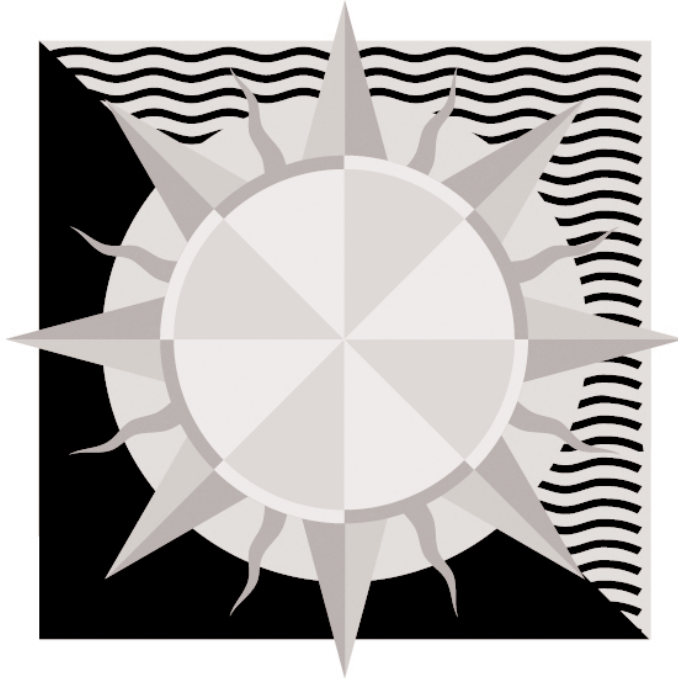
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