



Texas A&M University Response to
The Texas Higher Education Coordinating Board
Request for a Strategic Plan for Research
March 2010

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I. VISION STATEMENT

The institution's plan should address, at a minimum, the following elements:

A. A description of the targeted status of the institution. What kind of university will the institution be if it achieves its goals and objectives?

Texas A&M University pursues teaching, research, and service at the exceptionally high levels expected of America's great universities. Having achieved international recognition as a leading research and teaching institution, and as one of only 62 invited members of the Association of American Universities (AAU), realization of the University's goals articulated in this document will result in Texas A&M being viewed as a consensus top-10 public university. In doing so, Texas A&M will encourage and support exceptional achievements by faculty and students, expand the frontiers of knowledge, and serve the common good.

Creating a Culture of Excellence at Texas A&M University

The University's pursuit of preeminence is guided by a well-conceived, over-arching plan entitled *Vision 2020: Creating a Culture of Excellence*¹ (Appendix A). This plan, prepared in 1999 by a year-long, campus wide discussion involving over 250 stakeholders on- and off-campus, identified benchmarks for achieving national and international prominence. Beginning with our heritage as the state's oldest institution of higher education and as a designated land, sea, and space-grant institution, *Vision 2020* identifies imperatives in 12 specific areas where achievement would best serve the University, the state of Texas, and the nation – truly creates a culture of excellence.

Pursuing an Academic Master Plan for Texas A&M University

As Texas A&M approached the halfway point in the 20-year time-frame prescribed by *Vision 2020*, Texas A&M embarked on a planning effort that would focus institutional attention and resources to advance the 12 imperatives highlighted in that document. The Academic Master Plan (Appendix B), also the result of an extensive and highly inclusive series of discussions on campus, clearly sets forth next steps for Texas A&M's pursuit of *Vision 2020* goals in the form of three ambitious roadmap reports for (1) research, (2) teaching and learning, and (3) engagement and service. Each of these roadmaps provides essential elements for the University's response to the Coordinating Board's request for a Strategic Plan for Research.

B. Is the plan for the future a natural expansion of the institution's existing mission, or does it reflect a substantial change in direction?

This Strategic Plan for Research is fully consistent with Texas A&M's national standing and existing mission statement and allows for natural expansion.

Texas A&M is dedicated to the discovery, development, communication, and application of knowledge in a wide range of academic and professional fields. Its mission of providing the highest quality undergraduate and graduate programs is inseparable from its mission of developing new understandings through research and creativity. Students are prepared to assume roles of leadership, responsibility, and service to society. Texas A&M assumes as its historic trust the maintenance of freedom and inquiry and an intellectual environment nurturing the human mind and spirit. It welcomes and seeks to serve people of all racial, ethnic, and geographic groups, women and men alike, as it addresses the needs of an increasingly diverse population and global economy. In the 21st Century, Texas A&M seeks to assume a place of preeminence among public universities while respecting its history and traditions.

II. PLAN TO INCREASE RESEARCH FUNDING AND PRODUCTIVITY

The institution's plan to enhance research activities should address, at a minimum, the following elements:

A. *External funding.* Identify the institution's targets and how progress will be monitored. Include comparisons with national peers.

The National Science Foundation (NSF) data ranks Texas A&M among the top 20 research universities in the country in terms of research and development expenditures for FY 2008, the latest year reported by NSF (Appendix C). Among universities that do not combine funding awarded to health science centers or medical hospitals, Texas A&M ranks third in the country with \$582M in research and development expenditures. Highest ranked among this latter category of schools is the Massachusetts Institute of Technology with \$660M and the University of California at Berkeley with \$592M.

The growth of external funding at Texas A&M will also be substantially focused in the federal arena. Opportunities exist to grow this component of the University's funding, especially in the areas of the basic sciences in general, life sciences more specifically, and particularly in the biomedical sciences and engineering. Significant opportunities for growth exist in the National Science Foundation and particularly National Institutes of Health funding with the

¹ <http://www.tamu.edu/vision2020/>

II. PLAN TO INCREASE RESEARCH FUNDING AND PRODUCTIVITY (*cont.*)

development of new facilities (e.g. Interdisciplinary Life Sciences Building, Texas A&M Institute for Genomic Medicine, Texas A&M Institute for Preclinical Studies, National Center for Therapeutics Manufacturing); the maturation of science and engineering programs of faculty hired as a part of the faculty reinvestment program; the continuing investment in critical cutting edge equipment and state-of-the-art core facilities; and the increase in partnerships with the growing Texas A&M Health Science Center, to name just a few. In addition, the Academic Master Plan Research Roadmap process has laid a strong foundation for the successful large-scale federal funding of centers and institutes at Texas A&M, which will be actively and aggressively supported by University resources. Finally, an emphasis will be placed on obtaining large federal graduate training grants in parallel to increase the strength and competitiveness of our graduate programs.

Increasing external funding for Texas A&M will, of course, be a function of several internal and external factors. Among the internal factors will be the continued success of faculty and staff in seeking external funding and the provision of University support for the research, scholarly, and creative enterprise. External factors include the levels of external funding provided by leading federal and state agencies. At a minimum, the research and development expenditures should track the growth of faculty at Texas A&M; the investment of research funds in such areas as faculty start-up, seed funding, and research infrastructure; and the overall growth of federal and state research and development funding.

B. **Research priorities. Define and describe the institution's targeted research priorities. Describe where and how the institution will focus its efforts.**

Texas A&M presents a full array of high-profile research programs that characterize a Tier One research university. These research programs cut across a variety of disciplinary and interdisciplinary fields and represent the efforts of award-winning faculty and students. Consistent with the research goals outlined in Section I.A. of this plan, the University's targeted research priorities fall into three general areas: (1) research priorities by colleges wherein faculty reside and in which many research centers, institutes, and other research entities are overseen; (2) research priorities involving multidisciplinary research areas that build on distinguished faculty in several colleges who pursue common research agendas; and (3) research priorities that assure the comprehensive excellence of high-impact research, scholarship, and creative work at Texas A&M.

College Research Priorities

Primary responsibility for hiring, mentoring, and retaining outstanding faculty, the core of any Tier One research university, rests with the academic colleges. Colleges at Texas A&M have a history of promoting research excellence with programs that are appropriate to their respective disciplines. The results of college-led research initiatives include highly ranked departments and academic programs, leading-edge scholarship, outstanding graduates, and commercialization of applied research technologies.

Appendix D presents college research plans in their entirety. Table I gives a summary of the research strengths and research priorities for each college, for Texas A&M University at Galveston, and for Texas A&M University at Qatar. Notable in this listing are several major areas of overlap among various colleges including: (1) energy research and development, (2) health and well-being, (3) national security and safety, (4) environment and sustainability, (5) computational and information science, (6) education and human services, and (7) fundamental sciences. These areas of mutual interest hold considerable promise for collaborative research initiatives, some of which emerged in the Academic Master Plan's call for interdisciplinary research papers.

Multidisciplinary Research

As mentioned earlier, consistent with the priority of encouraging multidisciplinary or interdisciplinary research, Texas A&M recently undertook an Academic Master Plan process which sought, among other aims, to encourage multidisciplinary research initiatives. Appendix B presents detailed information about the Academic Master Plan's associated reports.

A call for multidisciplinary proposals produced 111 submissions that were reviewed by a Research Roadmap Committee. This number was reduced to 18 finalist proposals, from which eight proposals were selected for initial investment by the University:

- Advanced Institute for Sustainable Energy;
- Applied Math, Statistical and Computational Sciences;
- Texas Center for Digital Humanities, Media, and Culture;
- Institute for Quantum Science and Engineering;
- Nuclear Solutions Institute;
- Center for Phage Technology;
- Institute for Neuroscience; and
- Whole Systems Genomics Institute.

II. PLAN TO INCREASE RESEARCH FUNDING AND PRODUCTIVITY (*cont.*)

Table II lists these eight proposals with brief summaries of what are now called Initial University Multidisciplinary Research Initiatives (IUMRIs).

Comprehensive Research Excellence

Consistent with goals outlined in *Vision 2020* and strongly felt sentiments among the faculty, the Research Roadmap Committee also made several recommendations that would build excellence across the many disciplines and interdisciplinary areas across the campus.

Encouraging A Multiplicity of Models for Research. The call for multidisciplinary proposals produced a number of proposals from the social sciences, humanities, arts, and related fields. The Research Roadmap Committee recommended that "...there is a need for heightened understanding, promotion, and investment in support of research in the Arts, Humanities, and Social Sciences." In pursuing this objective, the University was urged to broaden the disciplinary representation in the Office of the Vice President for Research and to support initiatives that would advance research in these areas. Subsequently, the dean of the College of Liberal Arts joined the research office as a senior associate vice president for research, and the research office will undertake special initiatives to advance high-quality, high-impact scholarship and creative work in the social sciences, humanities, arts, and related fields.

Creation of the Texas Institute for Advanced Studies. Texas A&M University counts among its faculty many who have received national and international awards, including Nobel prizes; membership in the National Academies of Engineering, Science, Public Administration, and the American Academy of Arts and Sciences; Guggenheim fellowships; and Fulbright awards, to mention only a few major recognitions. The quality of mind represented by the faculty at Texas A&M draws international attention and scholarly visitors to the University. To establish an ongoing mechanism to build on this attraction and to encourage collaboration with the world's best scholars, the Research Roadmap Committee recommended the creation of a Texas Institute for Advanced Studies (TIAS). The institute would provide opportunities for one semester to one-year residencies for internationally prominent scholars to visit Texas A&M, to engage in collaborative projects with faculty and students, and to broaden the awareness of Texas A&M among the world's distinguished researchers. Initial funding for the operation of the institute has been identified, development activities to support the institute for the long term have been discussed at the highest levels of the University, and a proposal to establish TIAS is under consideration by The Texas A&M University System Board of Regents. A copy of plans for this institute and the proposal before the Board of Regents can be found in Appendix E.

Investing in Research Infrastructure. Supporting high-impact research requires strategic investments in people and facilities. The Research Roadmap Committee identified a number of potential roadblocks that would keep Texas A&M University from realizing its full potential as one of the national top research universities (Appendix B). Providing high-quality research facilities (including faculty offices, research laboratories, and spaces for teaching and collaboration) is absolutely critical to attracting and retaining distinguished faculty and exceptional students. The University has pursued an aggressive plan for building research facilities. A list of current projects is provided in Table III. These facilities join several recently completed buildings in which research will play a leading role, including the Interdisciplinary Life Sciences Building, the George P. Mitchell '40 Physics Building, and the George P. and Cynthia Woods Mitchell Institute for Fundamental Physics and Astronomy, as well as facilities built for the Texas A&M Institute for Preclinical Studies and the Texas A&M Institute for Genomic Medicine. The University is mindful of the need for additional research facilities to support nationally prominent researchers and their programs, and there are ongoing assessments regarding how to meet this need.

Infrastructure also includes organizational support for high-impact research. This includes competitive salaries and benefits to attract and retain faculty and staff, attractive recruiting packages for outstanding undergraduate and graduate students, and administrative structures maximizing incentives for externally funded research. The University and the A&M System are currently engaged in assessments in these areas, determining how resources might be marshaled to support a Tier One research university and meet the needs of an exceptionally productive faculty.

C. ***Allocation of resources. Estimate the budget necessary to achieve the targeted goals and describe how the institution will utilize funds, staff resources, facilities, and other assets to maximize its efforts.***

To achieve the goals outlined in the previous section of this Strategic Plan for Research, including those identified in individual college plans, the most important research investments for the University are in the areas of (1) hiring, supporting, and retaining distinguished faculty; (2) attracting, mentoring, and graduating the very best graduate students; and (3) providing world-class research facilities and research support services.

Distinguished Faculty

Hiring, supporting, and retaining distinguished faculty at all ranks is the hallmark of a Tier One research

II. PLAN TO INCREASE RESEARCH FUNDING AND PRODUCTIVITY (*cont.*)

university. In its most recent faculty hiring initiative, usually termed the Faculty Reinvestment Program, Texas A&M sought to hire new faculty members for over 450 newly authorized positions. These new hires have been completed, along with over 400 replacement hires during the same period. For each of these hires, departments and colleges recruited highly competitive candidates, offered market salaries and highly attractive start-up packages, and committed to supporting the professional growth of these faculty throughout their careers at Texas A&M. Retaining these newly recruited faculty, and the faculty who were already at Texas A&M University, has drawn increasing attention by departments, colleges, and the University. Thus, programs have been initiated to assure faculty members' professional success (Appendix F), and merit increases to keep salaries competitive have been implemented to the greatest extent possible. While the salaries of newly recruited faculty were set at peer levels and have generally kept pace with national norms, salaries for faculty at the associate professor and full professor ranks continue to lag behind national averages. The University will continue its efforts to assure that high-achieving faculty receive appropriate levels of compensation so as to retain the very best faculty.

In addition to salaries, professional development for the faculty and retention of the very best faculty is supported by the provision of world-class facilities and awards that recognize excellence in research, teaching, and service. The University is building, and has plans to continue providing, outstanding facilities for faculty. Additionally, faculty receive recognition for excellence in several on-campus award programs, most notably awards funded by The Association of Former Students. And, particularly important, the University continues to aggressively pursue private funding for endowed faculty chairs, professorships, and fellowships. The University's capital campaign successfully produced 174 endowments for chairs, professorships, or fellowships. Private fund raising efforts continue to seek such endowments.

Graduate Students

As a leading research institution, Texas A&M aims to educate the next generation of scientists, humanists, and creative artists, as well as graduate degree candidates for leadership positions in the public and private sectors. Toward that end, the University provides departments and colleges with funding and tools to attract the very best graduate students. These initiatives include funding to cover in-state tuition for students awarded competitive graduate assistantships, merit-based graduate student fellowships, opportunities for training in grant-writing and teaching, and awards to support graduate student research programs. A full description of these initiatives is found in Section IV.

Recruiting outstanding graduate students is highly competitive among the nation's top graduate programs. Inadequate or non-competitive graduate student support has been discussed in the overwhelming majority of the reviews of doctoral programs by external reviewers (as discussed in Section VI). The reviewers have acknowledged that many students receive modest graduate stipends, the tuition (but not fees) is paid for subsets of students, and students receive a modest health plan. Additional evidence of a shortfall in graduate student support comes from the salary study carried out in 2009 by the Associate of American University Data Exchange (AAUDE) which shows that Texas A&M's average teaching and research assistant stipends are typically 10-15 percent behind those of competitors. Thus, in contrast to competitive awards elsewhere, the stipends are usually lower than those provided by top-tier institutions and tuition and fees are waived by the universities. Texas A&M has sought to increase graduate student stipends within its current budget and has actively sought to increase the number of privately funded graduate fellowships. Faculty are also encouraged to include fully funded support packages when graduate research assistants are included in external grant applications. Recruiting and retaining the highest quality graduate students is a critical part of the support and ultimate success of Texas A&M faculty's research endeavors.

Research Facilities and Infrastructure

Research Facilities. Support for faculty, staff, and students pursuing high-impact research agendas requires world-class research facilities and exemplary infrastructure providing essential services to advance their work. Texas A&M has several research facilities that support high-impact research, including the Sterling Evans Library, Microscopy and Imaging Center, Cyclotron Institute, Center for Chemical Characterization and Analysis, Materials Characterization Facility, Laboratory for Biological Mass Spectrometry, Center for Nautical and Archaeological Conservation, Texas Market Research Center, and the Nuclear Science Center. Many recently completed buildings also have major research functions, including the Interdisciplinary Life Sciences Building, the George P. Mitchell '40 Physics Building, the George P. and Cynthia Woods Mitchell Institute for Fundamental Physics and Astronomy, Veterinary Research Building Addition, Nuclear Magnetic Resonance Facility, Veterinary Imaging and Cancer Treatment Center, and the Emerging Technologies and Economic Development Building. Several facilities administered by the A&M System are also used by researchers and are considered part of the region's research facilities, including facilities in the Texas Transportation Institute, the National Center for Therapeutic Manufacturing, the Texas A&M Institute for Preclinical Studies, and the Texas A&M Institute for Genomic Medicine.

II. PLAN TO INCREASE RESEARCH FUNDING AND PRODUCTIVITY (*cont.*)

The Division of Research and Graduate Studies (RGS) provides support for proposal development, pre-award services, and post-award services. These latter services are conducted in coordination with the Texas A&M Research Foundation, the Texas Engineering Experiment Station, and Texas AgriLife Research. Compliance with research policies and rules, biosafety, and overall security and use of research facilities is another important responsibility of the RGS. This latter responsibility includes management of the Comparative Medicine Program, which oversees laboratory animal facilities and projects. The RGS also oversees research involving human subjects through an Institutional Review Board (IRB), which authorizes all research involving human subjects.

Strengthening Interdisciplinary Programs. The University's priority on developing interdisciplinary programs that open new intellectual pursuits has been supported by a series of initiatives to encourage the development of multi- and interdisciplinary research and academic degree programs. Thus, the University has proposed and received approval for interdisciplinary doctoral programs in Food Science and Technology, Genetics, Marine Biology, Materials Science and Engineering, Molecular and Environmental Plant Sciences, Neuroscience, Nutrition, Toxicology, and Water Management and Hydrological Science.

Interdisciplinary research programs also have been encouraged through the creation of disciplinary and interdisciplinary research centers, including the Interdisciplinary Life Sciences Building. A complete list of the University's approved research centers and institutes is presented in Table IV. Texas A&M's Academic Master Plan has identified initiatives discussed in the previous section to encourage emerging interdisciplinary programs in eight promising areas. Each of these initial initiatives will be advanced with: (1) additional faculty hires, primarily at the senior level; (2) start-up funding for faculty hires and for program development; and (3) operating funding to assure continued success for the initiative. Specifically, by FY15, the base funding for these eight initiatives will be approximately \$4.3M to support new faculty hires and operating expenses (including new staff resources). The University allocation will be joined by funding from colleges and associated agencies that will approach \$1M. In addition to these base funds, approximately \$23M in one-time funds will be used through FY16 for program start-ups and faculty start-up packages to attract senior-level researchers. Each program will be overseen by a council of participating deans, with specific set markers for achievement by which success will be measured.

Supporting Comprehensive Excellence. Complementing the funding mentioned above, the University plans to allocate \$1M to support emerging multidisciplinary initiatives, \$500,000 to seed funding for the Texas

Institute for Advanced Studies, and approximately \$500,000 for graduate and undergraduate student research programs. These funds complement ongoing support for research initiatives among newly hired faculty and expanded programs in the social sciences, humanities, the arts, and related fields.

D. *Student participation.* Describe how the institution will enhance student opportunities to participate in research activities at the graduate and undergraduate levels.

Undergraduate Students

The Office of Undergraduate Research serves undergraduate students and is housed in the Office of Graduate Studies in the Division of Research and Graduate Studies. An associate dean for undergraduate research works in partnership with the associate provost for undergraduate studies, and additional support is provided by graduate assistants. The University has a variety of programs that support undergraduate research, three of which are detailed below.

Undergraduate Research Scholars Program. The Undergraduate Research Scholars Program gives undergraduates an opportunity to actively participate in independent research projects, communicate that research as an author to the University research community, and submit an undergraduate thesis, which is deposited into the Repository on the University Libraries website. These activities make participating students more competitive for national fellowships and helps prepare them for graduate studies. This program was initiated in 2006, with the first class of 25 students and has grown steadily over the past five years to support approximately 100 undergraduate students working on independent research projects. As part of the University's effort to enhance the undergraduate experience, the plans are to expand this program to reach more of the undergraduate student population.

Student Research Week. This University-wide event is organized by the Graduate Student Council and provides an opportunity for undergraduate and graduate students to present research during three days of poster and oral competition, as well as to learn about research resources on campus. This program has been in place for over 10 years and has grown to include over 500 participants annually (~300 graduate and ~200 undergraduates). Some of the events during Student Research Week include: lunch panels, resource tables, research symposiums, and esteemed speakers.

University Undergraduate Research Fellows Program. Participants in the University Undergraduate Research Fellows program benefit from a two-semester research experience, conducted under the supervision

II. PLAN TO INCREASE RESEARCH FUNDING AND PRODUCTIVITY (*cont.*)

of an accomplished faculty member; the publication of a completed Honors thesis in the Digital Repository Library at Texas A&M and accessible by future researchers; graduate-quality research, accommodated with extended library privileges and a library study space; inclusion in an established scholarly community that features regular workshops, allowing for the sharing of ideas across disciplines; gained experience in planning and managing a research budget of at least \$300; a \$3,000 funding opportunity for summer research; and recognition as a University Undergraduate Research Fellow at commencement and on official transcripts.

In addition to these programs, undergraduate students may apply for research travel and presentation grants from the Honors Program, travel support to attend the Lone Star Graduate Diversity Colloquium, and access to publish in the undergraduate research journal, *Explorations*. Several colleges at the University also provide support for undergraduate research through undergraduate course requirements as well as through summer research programs (Research Experience for Undergraduates).

These Texas A&M programs are funded by the Office of Graduate Studies, the associate provost for undergraduate studies, and Honors Program, with support from the Association of Former Students.

Two additional programs at the undergraduate level are worthy of note. First, Texas A&M has a variety of methods for incorporating research into the undergraduate curriculum including: 491 (research) courses, senior honor theses, and inquiry-based courses (specific courses designated as “I courses” which have an emphasis on examination and analysis). The most recent Quality Enhancement Plan (QEP) funded Inquiry-based undergraduate education through allocations to colleges. The results of these curriculum changes are part of the University-wide assessment being carried out in preparation for our re-accreditation in 2012. The data showing the progress being made in enhancing the research experiences for our undergraduates may be viewed in the WEAVEonline database².

Second, extracurricular initiatives also include a research emphasis with hundreds of undergraduates employed on campus in research laboratories and projects. These positions are listed through individual programs and a common student employment system operated by Scholarships and Financial Aid. Additionally, with over 800 student organizations, many, such as career or major-oriented clubs, are dedicated to further exploration of research in career fields. Some of our student organizations participate in local and national competitions to further enhance their research and presentation skills.

Graduate Students

The Office of Graduate Studies (OGS) provides a central contact for supporting the graduate students in all graduate programs. While admission to these programs is decentralized, the Office of Graduate Studies provides the coordination necessary to support centralized activities such as: Graduate Student Council and Student Research Week; AFS-Merit Graduate Fellowship Program; Diversity Fellowship Program; Pathways Fellowship Program; research travel grant awards; graduate recruiting travel grants; and AFS Excellence in Teaching and Research Award programs. To further assist in providing the widest range of research opportunities to graduate students, the OGS administrative home is in the Division of Research and Graduate Studies. This linkage provides the graduate programs access to the resources made available through the broad range of research supported on campus.

The University, through OGS, further supports students in the programs by providing tuition scholarships for students holding research or teaching assistantships. This tuition support helps to attract the best graduate students and allows them to complete their studies faster.

The Thesis Office in OGS also supports our students and their research. This office not only reviews the student’s manuscripts for format and compliance, but also they provide students with instruction on manuscript preparation if needed. These activities, coupled with those of the Writing Center supported by the associate provost for undergraduate programs, provide our students with the support they may need to produce their theses or dissertations. During a typical academic year, the Thesis Office processed over 1000 theses and dissertations written by Texas A&M graduate students.

OGS also coordinates several national fellowship awards including the National Science Foundation Graduate Research Fellowship, National Physical Sciences Consortium Fellowship, Hertz Foundation Graduate Fellowship, and Ford Foundation Graduate Fellowship. To assist students in submitting competitive applications for these programs, the Division of Research and Graduate Studies hosts a number of proposal development workshops targeted at students and their particular needs.

As mentioned in Section II.B. of this report, the University, as a result of its recent Academic Master Plan exercise, has identified a number of multidisciplinary research initiatives. Three of these initiatives will benefit from graduate fellowships funded by an endowment from the HEEP Foundation. This commitment supports fellowships for students in the neuroscience program, the quantum science and engineering program, and the newly created Texas Institute for Advanced Studies.

² <http://assessment.tamu.edu/WEAVEonline.htm>

III. PLAN TO IMPROVE UNDERGRADUATE EDUCATION

The institution's plan should address, at a minimum, the following elements:

A. Describe the institution's plan to strengthen and improve the quality of undergraduate education, including the student profile.

In the fall of 2009 Texas A&M embarked on an Academic Master Plan which included the development of a teaching and learning roadmap. This roadmap emphasized common learning outcomes for all students, both undergraduate and graduate³.

The general goals for undergraduate education at Texas A&M, simply described, are: master the depth of knowledge required for a degree; demonstrate critical thinking; communicate effectively; practice personal and social responsibility; demonstrate social, cultural, and global competence; prepare to engage in lifelong learning; and work collaboratively. The University community is embarking on implementation of these outcomes through curricular and co-curricular programs. At the University level, it is recognized that undergraduate research experiences and inquiry-guided learning are two of the avenues available to reach these learning outcomes and as such have been incorporated in many of our undergraduate degree programs (Appendix G, *Final Report of the Committee on Implementation of the Recommendations Made by The Task Force on Enhancing the Undergraduate Experience*).

To strengthen undergraduate education, Texas A&M undertook several especially important initiatives, including establishing the University Studies Degree, increasing the number of learning communities and small classes, incorporating inquiry-based instruction into curricula, emphasizing undergraduate research, setting a communication graduation requirement of two courses within the discipline, one of which must be writing intensive, and establishing the University Writing Center.

Texas A&M University has long been committed to meeting the needs of the state of Texas by providing access to higher education to all citizens and producing graduates to meet the needs of the ever-changing economic and demographic composition of Texas. Texas A&M has developed two signature programs to enhance the recruitment and retention of underrepresented groups, including African Americans, Hispanics, and first generation college students. These programs, Aggie Access⁴ and Regents' Scholars⁵ have been successful in both recruitment and retention

through a variety of financial assistance, academic support, and curricular projects. In addition, the Century Scholars Program, a partnership between Texas A&M and participating high schools in the Dallas, Fort Worth, Rio Grande Valley, San Antonio, and Houston areas, continues to successfully recruit and retain students for underrepresented high schools.⁶ Details on this program can be found in the *Uniform Recruitment and Retention Report, 2009*, in Appendix H.

B. Describe what the institution is doing to increase the number of baccalaureate degrees awarded, particularly in the critical fields identified in *Closing the Gaps by 2015*.

Texas A&M offers world-class education to more than 38,000 undergraduates. This number is not likely to increase due to space limitations on the College Station campus and the number of faculty at the University. Nevertheless, Texas A&M has undertaken a series of initiatives that encourage recruiting the best students from diverse backgrounds in Texas.

Recruiting and Retention

Beginning in 2003, Texas A&M established eight Prospective Student Centers around the state. These offices are unique because they are staffed by admissions recruiters and by financial aid experts who actively recruit in high schools. These combined offices ensure that all students and parents understand the benefits of higher education and the necessary steps to prepare academically and financially for college (*Closing the Gaps Goal 1.III*). As a result, Texas A&M has closed the gaps in participation. In the last five years, First Time In College (FTIC) enrollment has increased by 13.6 percent and FTIC in STEM disciplines has increased from 30.5 percent to 40.9 percent.

Texas A&M established an affordability policy that ensures students are able to participate and succeed in higher education (*Closing the Gaps Goal 1.IV*). Texas A&M disburses approximately \$450M in scholarships and grants annually. The Regents Scholars program specifically supports 600 first generation and low-income students annually. The \$12M cost of the Regents Scholar Program is funded from the tuition increase set-aside. In addition, Texas A&M has established the Aggie Assurance scholarship⁷, which provides free tuition to all students with family incomes less than \$60K. As a result of these and other initiatives, minority enrollment in the freshman class has increased to 28.0 percent for all minority students combined and to 20.9 percent for African American and Hispanic students. The gap in enrollment of minorities is closing.⁸

³ <http://provost.tamu.edu/academic-master-plan/documents/TLRCReport2009Jun19.pdf>

⁴ <http://aggieaccess.tamu.edu>

⁵ https://scholarships.tamu.edu/tamu_scholarships/freshman/regents.aspx

⁶ https://scholarships.tamu.edu/tamu_scholarships/freshman/regents.aspx

⁷ https://financialaid.tamu.edu/Types/aggie_assurance.aspx

⁸ <http://www.tamu.edu/oisp/student-reports/enrollment-profile-fall-2009-certified.pdf>

III. PLAN TO IMPROVE UNDERGRADUATE EDUCATION (cont.)

Texas A&M will continue to enhance the prospective Student Center model to close the gaps in participation. Texas A&M is also committed to ensuring that college is affordable and will continue to develop new scholarship opportunities for students. Indeed Texas A&M is embarking on a \$300M scholarship campaign through the Texas A&M Foundation. To date, over \$190M in scholarships has been raised from private donations for this initiative.

Successful and Timely Graduation

Equally, Texas A&M is committed to closing the gaps in successful and timely graduation. The four-year graduation rate has increased to 49.8 percent for the 2005 FTIC cohort, up from 38.4 percent just five years ago. *Vision 2020* calls for enhancing the undergraduate experience and the development of initiatives, such as learning communities and first-year seminars, aimed at increasing student satisfaction and retention. University-wide over 40 percent of the freshman class is involved in a small class, first-year seminar, or learning community. In addition, Texas A&M has implemented a financial incentive for students, the flat rate tuition policy⁹ in which full-time students pay the same amount of tuition regardless of how many hours they take. Finally, Texas A&M has established a career track for student advisors so that the professional development opportunities of organizations such as the National Academic Advising Association (NACADA) may be inculcated into the advising structure of the University and colleges.

A number of programs and services substantially impact persistence of undergraduate students in the critical fields of education, math, science, and engineering. The Dwight Look College of Engineering hosts the Learning to Excel in Engineering through Preparation (LEEP) Summer Bridge program for entering freshmen.¹⁰ LEEP brings students to campus for five weeks before their first semester to allow time for adjustment and successful completion of a three SCH course. The college also involves students in living-learning communities to aide in the transition to college. The College of Science houses the Center for Math and Science Education and aggieTEACH,¹¹ both aimed at increasing the number of math and science teachers. In addition, an NSF-funded program that partners Texas A&M with Palo Alto College (PAC) supports students in science fields for two years at PAC and then at Texas A&M.¹²

IV. PLAN FOR DOCTORAL PROGRAMS

1. Existing Doctoral Programs

The institution's plan for existing doctoral programs should address, at a minimum, the following elements:

- A. *Summary of existing programs. Using past reviews, provide an evaluation of the institution's existing doctoral programs and how they fit into the institution's near-term and long-range plans. Include an assessment of strengths and weaknesses.*

Texas A&M currently has 99 doctoral programs. The listing of these programs and the requirements for these degrees can be found in the current Graduate Catalog.¹³ The most recent national review of the nation's doctoral programs occurred in the mid-1990s by the National Research Council (NRC). That review placed Texas A&M 16th among public universities. The results of the most recent NRC evaluations begun in 2005 have yet to be published, but Texas A&M fully expects that the programs have improved significantly.

Many of the graduate programs are also reviewed annually by various publications such as *U.S. News and World Report*. The overall ranking of Texas A&M's graduate programs by *U.S. News* in 2010 was 14th among public universities and 33rd overall. In examining the rankings of individual programs, Texas A&M's engineering graduate program ranks 14th overall and 8th among publics; Texas A&M's Earth science program ranks 34 (21 among publics) Texas A&M's science programs range in rankings from 22 (9 among publics) for chemistry to 45 (26 among publics) for physics. The social sciences and humanities programs range in rankings from 24 (11 among publics) for political science to 74 (44 among publics) for history. The overall ranking for the business programs is 33 (14 among publics); education programs 47 (31 among publics); veterinary medicine 5 (3 among publics); public affairs 36 (23 among publics); and architecture 26 (14 among publics).¹⁴

Based on external program reviews, a number of strengths have been seen in these programs: (1) demonstrated record of strong faculty and student scholarship; (2) substantial levels of extramural funding to support these programs; (3) support in the development of new interdisciplinary programs; and (4) faculty that is recognized nationally and internationally as leaders in their respective areas of scholarship. These areas of strength are in strong alignment with our *Vision 2020* goals.

⁹ <http://finance.tamu.edu/sbs/tuition/UG-Resident-FY10.pdf>

¹⁰ <http://essap.tamu.edu/leep>

¹¹ <http://www.science.tamu.edu/outreach>

¹² <http://www.science.tamu.edu/sciencescholars>

¹³ http://www.tamu.edu/admissions/catalogs/pdfs/GRAD_catalog09_10.pdf

¹⁴ <http://www.tamu.edu/oisp/reports/vision-2020-progress-2009.pdf>

IV. PLAN FOR DOCTORAL PROGRAMS (cont.)

From these program reviews there are also a number of recurring challenges that appear. Several include: (1) aging facilities; (2) non-competitive compensation packages for both faculty and graduate students; (3) the coming retirement of many of the “baby boomer” faculty; (4) insufficient startup funding for new faculty hires; and (5) faculty and student diversity.

The plans to address these issues are part of the long-range plans formulated by the colleges and departments, and are being addressed as resources for these issues can be identified.

B. *Quality control. Describe plans to close, consolidate, and/or improve existing doctoral programs with low graduation rates (based on Coordinating Board standards for low-productivity) or that do not meet other standards of excellence.*

Texas A&M has had a doctoral program review process since 1998. While the Texas Higher Education Coordinating Board (THECB) has not yet developed a “best practice” requirement for doctoral program review, the process that Texas A&M has put in place may inform development of a standard for all programs in the state. The process uses an external review team to perform this evaluation and is based on the study carried out by the Council of Graduate Schools and reported in the document entitled, *Assessment and Review of Graduate Programs: a Policy Statement*, published in 1990.¹⁵ The process begins first by composing a “self study” covering academic programs under review. This report is forwarded to a review team in advance of their visit to campus. The external team spends three days on campus talking to all stake holders and formulating their evaluation and recommendations. The review team then writes a formal review report which is then critiqued by the department and used as a basis for future planning and program improvement. These reviews are on an eight-year cycle, resulting in approximately 10 of these reviews being carried out in a typical academic year. The self-study documentation produced for these reviews is made available on the web. These reviews are then used to evaluate the programs and to develop strategies to further improve their effectiveness. In addition, they can be used to help establish priorities for new hires or develop new directions in research.

In the past year, the THECB has established another set of metrics to be used in comparing the success of doctoral programs in the state. The 18 Characteristics of Doctoral Programs was selected to perform dual roles. The first role was to allow prospective graduate students the ability to compare the programs at dif-

ferent institutions in the state as they decide where to attend graduate school. These metrics were based on much of the same information that was collected by the National Research Council in their 10-year study of graduate programs in 2005. In the last year, it has become clear that THECB is also preparing to use these characteristics as a way of evaluating the effectiveness of the many doctoral programs in the state. The first set of data for the 90-plus graduate programs can be found on the OGS website.¹⁶

Information regarding trends and demographics of graduates from doctoral programs at Texas A&M is presented in a recent analysis of the Texas A&M Office of Institutional Analysis and Planning.¹⁷

For those programs that are recognized by the THECB as under-producing, these reviews will lead to discussions on how to either improve enrollments with timelines for achieving these enrollment targets or plans for closing down these programs.

C. *Quality enhancement. Describe plans to raise the level of existing doctoral programs from the level of strength to the level of national prominence.*

Texas A&M has in place multiple levels of quality enhancement regarding the doctoral programs. As noted above, Texas A&M carries out periodic external reviews, which are used as a basis for improvement in these programs. Over the past few years, these external reviews have been expanded to include not only the doctoral programs, but also to cover all academic programs (graduate and undergraduate).

In the past academic year, the Academic Master Plan process was designed to elicit proposals from the faculty on how they could raise their particular programs to the level of national/international prominence. This process resulted in the selection of the eight Initial University Multidisciplinary Initiatives described in Section II.B.

In addition to the external reviews, the University conducts an annual review of its academic programs for the purpose of maintaining the regional Southern Association of Colleges and Schools (SACS) accreditation. This evaluation is based on goals/learning outcomes that have been set by the program and its faculty and is recorded in a University-wide assessment database, WEAVEonline. In addition to these program-specific goals, the University has established a set of overarching learning outcomes for graduate students and is beginning a process to evaluate student outcomes in these areas as well. For doctoral degree students, these outcomes are as follows: (1) mastery of degree program requirements;

¹⁵ <http://ogs.tamu.edu/faculty/program-review-self-study/APRGdlns-Oct08WEBVersion.pdf>

¹⁶ <http://ogs.tamu.edu/prospective/18-characteristics-doctoral-programs.html/>

¹⁷ <http://www.tamu.edu/oisp/reports/survey-earned-doctorates-sed-1958-2007.pdf>

IV. PLAN FOR DOCTORAL PROGRAMS *(cont.)*

(2) possess the ability to apply a variety of strategies and tools, use a variety of sources, and evaluate multiple points of view to analyze information in order to conduct critical reasoned arguments; (3) communicate effectively; (4) develop clear research plans and conduct valid, data-supported, theoretically consistent, and institutionally appropriate research and effectively communicate the results; (5) use appropriate technologies in their research; (6) teach and explain the subject matter of their discipline; (7) choose ethical courses of action in research and practice. See Appendix B for the *Teaching and Learning Roadmap Report*.

D. Comparisons with national peers. For programs the institution plans to retain, identify nationally-ranked programs against which each of the institution's existing doctoral programs will be benchmarked.

Vision 2020 established a list of peer institutions that is used in many program comparisons. This list of institutions includes: The University of Texas at Austin, University of California-Berkeley, University of Michigan, University of North Carolina-Chapel Hill, University of California-Los Angeles, University of California-San Diego, University of Wisconsin, University of Florida, Georgia Institute of Technology, University of Illinois, University of Minnesota, The Ohio State University, Pennsylvania State University, Purdue University, and University of California-Davis. In addition, the THECB has developed a list of peer institutions that are available on their website. Each program also has a more targeted list of peer institutions that are used in making program-by-program comparisons.

2. New Doctoral Programs

The institution's plan for new doctoral programs should address, at a minimum, the following elements:

A. Areas of emphasis. Identify the areas the institution plans to focus on in the development of new doctoral programs. Emphasis should be placed on high-need areas, such as STEM, with sufficient documentation to support selection decisions. The plan should also demonstrate how the institution will build upon existing strengths.

Proposals for new doctoral programs at Texas A&M are developed by the colleges and departments in response to each college's long-range plan. Over the past decade, Texas A&M has seen a continued growth in programs in the areas of life science as well as the other STEM disciplines. While the University has not limited its new program growth to just this area, a significant portion of the increase can be found in related

fields. In addition, as noted in the description of the various planning processes over the past several years, a campus-wide increased emphasis is being placed on developing and sustaining a number of new multidisciplinary programs. The possible extent for the development of new programs in these areas can be seen in the list of Initial University Multidisciplinary Research Initiatives presented earlier. The programs for which proposals have been developed or are in the process of being developed are:

1. astronomy (proposed)
2. European studies (proposed)
3. marine biology (approved)
4. neuroscience (approved)

B. Assessment. Provide a plan for the rigorous, periodic review of proposed programs using external evaluators.

Texas A&M has a long-standing comprehensive external review process in place for all of its doctoral programs. In addition to the process outlined earlier in Section IV.1.B., these programs must carry out a mid-term review at the five-year mark of the program's existence to ascertain whether or not the original performance targets have been met and what actions, if any, are needed to ensure success. This mid-term review is an internal process.

C. Regional Impact. If applicable, describe the ways in which the development of doctoral programs and enhancement of research will enable the institution to better meet the needs of the region it serves and explain how the institution will monitor and assess its impact.

One of the components in the proposal process for new doctoral programs is to evaluate both the regional and national need, as well as the regional and national impact. The programs noted above have all been identified as having major impact in one, if not both, of these areas and provide Texas A&M the opportunity to build on our existing strengths in several allied research areas.

The Interdisciplinary Graduate Program in Marine Biology is unique in its design because it involves multiple institutions positioned along the lower and upper coast of Texas (Texas A&M University-Corpus Christi, Texas A&M, and Texas A&M University at Galveston). This model allows for student exposure to expertise and research opportunities for the entire regional coastal ecosystem within one single academic program.

IV. PLAN FOR DOCTORAL PROGRAMS *(cont.)*

The Interdisciplinary Program for Neuroscience is also unique among the growing number of such programs across the country. The Texas A&M program is a joint program with the Texas A&M Health Science Center, which brings together researchers across 11 colleges, including the College of Veterinary Medicine and Biomedical Sciences. Bringing together neuroscientists working with both humans and animals was seen as a particular strength for this program.

The research area of observational astronomy has been revolutionized in the past few decades as a result of advances in semiconductor and computer technology. Texas A&M has built a cadre of faculty who are leaders in this area of research and who give students access to some of the most advanced observational astronomy facilities in the world. While the numbers of students in this program will be kept small, the expectation is that these students and their research will be of the highest quality, recognized both nationally and internationally.

In an age of ever increasing economic and political globalization and intercultural exchange, the Department of European and Classical Languages and Cultures is uniquely positioned to contribute to *Vision 2020* and its mission of internationalization by establishing the state's only doctoral program in European studies. The Ph.D. program in European studies now being proposed by Texas A&M will prepare students for careers in higher education, international affairs, international business, and foreign service. More than a traditional Ph.D. program in language training and foreign literature, the proposed program is a rigorous interdisciplinary program involving training in cultural studies, history, politics, philosophy, and international affairs. It will also attract international students and European scholars with diverse interests, backgrounds, and areas of expertise to Texas A&M. Finally, it will serve the needs of the state in preparing graduates to teach at the college and junior college levels by providing them with teaching experience at the university level. In reviewing current job advertisements for junior colleges, there is a strong preference for this type of experience.

The new programs emerging from the Initial University Multidisciplinary Research Initiatives are also envisioned to build on Texas A&M's existing strengths with an emphasis on elevating these programs to the next level in national and international recognition. As proposals for new doctoral programs emerge from these IUMRIs the leaders will be delineating the impacts in these areas.

V. PLAN FOR FACULTY AND STUDENT DEVELOPMENT

The institution's plan for faculty and student development should address, at a minimum, the following elements:

- A. *Faculty research. Describe plans to assist faculty in becoming more productive, more innovative, and more effective in their work.*

Texas A&M is committed to recruiting, developing, and supporting world-class faculty. The recruitment of individual faculty members is a combined effort of academic departments, colleges, and the University as a whole to attract and retain the very best. The resources and infrastructure of the entire University are a necessary part of this process. Key to the recruiting process is identifying individuals who are or have the potential to be leaders in their fields and, thus, are highly competitive for external grants, major publications, impactful contracts, and recognition, as well as highly effective teachers and mentors to students. To assist in the development of the skills needed to be an outstanding faculty member, the dean of faculties offers many avenues for personal and career development (Appendix F).

In the area of research, scholarly, and creative work, there are specific activities that help individuals and groups of faculty develop and enhance the skills that they need to excel. The Division of Research and Graduate Studies is a key resource in this area. The Division helps identify funding opportunities and works with individual faculty members to assemble proposals. They also provide both general and specific workshops that help faculty members hone their grant writing skills. Finally, they work to assemble teams of faculty needed for large-scale federal, state, private foundation, and corporate funding. As the research portfolio of the institution matures, it is necessary to provide mechanisms to catalyze and encourage large-scale collaborative efforts. Texas A&M is committed to these efforts.

Texas A&M also works to help move discoveries and creative activities from the laboratories and classrooms to Texas and the rest of the world. In some cases, this involves technology transfer and commercialization, and in others it involves finding avenues for the publication and dissemination of scholarship and creative endeavors to the world. Many of these efforts require individual and tailored approaches to help facilitate and build partnerships between the faculty and external corporations or groups.

As discussed in this report, a major effort is now underway to facilitate interdisciplinary and multidisciplinary activities. By definition, this involves faculty from many departments, colleges and other units

V. PLAN FOR FACULTY AND STUDENT DEVELOPMENT (cont.)

of Texas A&M. The external funding opportunities and agencies increasingly demand interdisciplinary approaches to problems. Texas A&M is working to bring together outstanding discipline-based programs to form inter- and multidisciplinary teams. These efforts are highlighted in two major initiatives and projects at Texas A&M.

The Interdisciplinary Life Sciences Building (ILSB) is a concrete example of a new state-of-the-art physical facility whose primary goal is to foster interdisciplinary approaches to some of the major questions in the life sciences. This \$100M facility is the home or future home to both existing and new faculty members working in the areas of neuroscience, structural biology and bioinformatics.¹⁸ The building also houses three core facilities to aid researchers across campus including the Microscopy and Imaging Center, the X-Ray Diffraction Laboratory, and the Laboratory for Biological Mass Spectrometry.

As a result of the campus-wide Academic Master Plan process, eight Initial University Multidisciplinary Research Initiatives (IUMRIs) were identified and are moving forward. The eight initial areas span a wide range of activities and represent major investments in the research enterprise from the University. These initiatives are discussed throughout this document.

B. *Faculty recognition. Describe plans to assist faculty in achieving recognition as leaders in their field.*

Texas A&M has several efforts underway to promote and advance the recognition of faculty on the state, national, and international levels. Many departments and colleges have formal mechanisms in place to nominate and cultivate their faculty for discipline-based society research and scholarly activity awards. As an institution, Texas A&M seeks to share these best practices with colleagues in order to achieve even more recognition for faculty. There are also efforts underway to help elevate the competitiveness of faculty for some of the most prestigious awards and memberships in organizations like the National Academies of Science and Engineering as well as the American Academy of Arts and Sciences.

C. *Collaborations and Partnerships. Describe plans to foster cooperative efforts amongst faculty at the institution and with faculty of other institutions.*

Texas A&M encourages faculty collaboration within the institution and establishing strategic ties with domestic and foreign institutions. Texas A&M's efforts include the following areas: (1) interdisciplinary programs, (2) programs within the A&M System,

and (3) programs with domestic and international institutions.

Interdisciplinary Programs

Interdisciplinary work at universities is often one of the most difficult activities to initiate, sustain, and reward. Nevertheless, Texas A&M has a number of research centers and institutes that encourage interdisciplinary work by bringing together different disciplinary perspectives. A listing of Texas A&M's research centers and institutes is included at Table IV.

The University also encourages interdisciplinary programs by providing faculty a means to institutionalize collaborative programs. University Rule 15.01.99.M7, Administrative Framework for Interdisciplinary Programs, provides a process for the creation of Interdisciplinary Research Programs and Interdisciplinary Degree Programs. Essentially, these procedures establish processes by which faculty interdisciplinary efforts may be recognized and overseen by a Council of Participating Deans. The interdisciplinary research programs do not require Board of Regents' approval, but the Board of Regents and the Texas Higher Education Coordinating Board approvals are required for interdisciplinary degree programs. A copy of the University rule is included in Appendix I.

The Research Roadmap portion of the University's Academic Master Plan (AMP) explicitly encourages faculty collaboration. As described in Section II.B. and discussed in Appendix B, the AMP Research Roadmap process yielded 111 initial proposals which were narrowed to eight final IUMRIs. Many of the faculty-to-faculty contacts created among the 111 original papers are continuing to flourish, and the Office of the Vice President for Research is now following through with discussions among deans, department heads, and faculty to encourage their development.

The University has been especially conscious of the challenges faculty may face in pursuing interdisciplinary research and teaching. These difficulties are particularly evident in faculty evaluations and reviews. For this reason, the University has adopted guidelines that encourage faculty to report interdisciplinary activities and ask departments and colleges to take interdisciplinary work into consideration for annual reviews and other evaluations. Some colleges have also taken the step of making interdisciplinary faculty appointments and establishing formal guidelines for consideration of faculty performance in annual reviews and in promotion/tenure considerations.

Collaborations within the A&M System

The Texas A&M University System includes 11 universities and 7 agencies across the state, and faculty

¹⁸ <http://ilsb.tamu.edu/about-the-ilsb>

V. PLAN FOR FACULTY AND STUDENT DEVELOPMENT (*cont.*)

at Texas A&M have research relationships with many researchers in these A&M System components. Especially important among these relationships are those with Texas AgriLife Research, the Texas Engineering Experiment Station, and the Texas Transportation Institute. Collaboration in the life science area has involved the Texas A&M Health Science Center and the recently established Texas A&M Institute for Pre-clinical Studies, Texas A&M Institute for Genomic Medicine, and the National Center for Therapeutic Manufacturing.

Collaboration with Domestic and International Institutions

The University is supportive of faculty, department, and college initiatives that involve collaborations with researchers at other institutions. Texas A&M, for example, has numerous Memoranda of Understanding (MOU) or Memoranda of Agreement (MOA) with international institutions. A listing of the international MOUs are presented in Appendix J. In reality, however, these MOUs dramatically underestimate the number and quality of international collaborations by faculty with researchers at other institutions.

Illustrative of the collaborations at the highest level of visibility and impact are those in which Texas A&M is a member of a research consortium or is in partnership with major national laboratories. Texas A&M, for example, hosts the Integrated Ocean Drilling Program (IODP), which involves Texas A&M, Lamont-Doherty Earth Observatory of Columbia University, and the Consortium for Ocean Leadership. A summary of the IODP program can be found in Appendix K.

In 2003, Texas A&M established a branch campus in the State of Qatar (Texas A&M at Qatar) in partnership with the Qatar Foundation (QF). This branch campus offers undergraduate degrees in four engineering disciplines: chemical, electrical, mechanical, and petroleum. The branch campus has active research programs primarily in these four engineering disciplines and in science disciplines: chemistry, mathematics, and physics. Texas A&M at Qatar faculty members pursue research and scholarly opportunities and have amassed an impressive record of publications and scholarly recognition. Texas A&M has been able to marginally support the research effort to date in the branch campus in Qatar. It is currently negotiating with the QF to seek the approval of its proposed comprehensive research infrastructure necessary to sustain the research activities in the branch campus.

Another recent example of domestic collaboration and partnership that involves both research and educational components is from the Texas Engineering Experiment Station (TEES) and a United States Air Force sponsored Multi-University Research Initia-

tive (MURI). Participants include members from academia (Texas A&M, Virginia Tech, Stanford, and University of Dayton) and industry.

Texas A&M and the Consejo Nacional de Ciencia y Tecnología (CONACYT) entered an agreement of cooperation in higher education and research in April 2001. This collaboration was extremely beneficial, leading to a new two-year agreement in September 2008. The program established by these agreements, the *Collaborative Research Grant Program*, grew from mutually recognized interests in topics important to the U.S. and Mexico. The overall objective of the program is to stimulate significant international research cooperation by providing seed money for collaborative research between Texas A&M and higher education institutions in Mexico or CONACYT research centers.¹⁹

D. ***New faculty.* Describe plans to recruit additional faculty who can contribute to the institution's goal of maintaining or achieving national recognition.**

Texas A&M has completed a "faculty reinvestment" program which brought more than 450 outstanding faculty to fill newly created positions during the previous six years. These newly hired faculty were in addition to over 400 exceptional faculty hired to replace faculty who retired or departed from the University. Many of these newly hired faculty were entry-level hires, but they have already distinguished themselves as researchers and scholars, reachers, and professional colleagues.

The University's Academic Master Plan will bring a new round of hires, almost exclusively at the senior level, in association with the eight IUMRIs (Table II). Under current plans, 19 senior and 4 mid-career faculty will be hired to advance these 8 initiatives. The aim will be to attract clusters of senior scholars in the areas targeted by these 8 initiatives to build on existing strengths at Texas A&M. Among the senior hires, the expectation is that each hire will be or will potentially be a member of the National Academies or will have an equivalent level of standing in his or her discipline. The funding for these hires has been identified and totals \$4M for salaries. Start-up funding of approximately \$20M has also been identified to attract these outstanding scholars.

E. ***Student awards.* Describe initiatives to increase the number and prestige of undergraduate and graduate student competitive research awards.**

There are a number of competitive awards that are available to Texas A&M students at both the graduate and undergraduate level. The Honors Fellows

¹⁹ <http://conacyt.tamu.edu/>

V. PLAN FOR FACULTY AND STUDENT DEVELOPMENT (cont.)

Program and the Undergraduate Research Scholars Program are aimed at recognizing the best undergraduate students as described in Section II.D. In addition, students also compete for nation-wide undergraduate awards such as the Goldwater, Rhodes, Fulbright-Muskie Fellowship programs. The Honors Program Office works with potential candidates to help prepare them for these competitions.

The Graduate Student Council also hosts an annual Student Research Week (SRW) described previously that offers students the opportunity to present their research and be recognized for their scholarly achievements. Over the past several years, the participation in SRW has grown to over 600 students, with a split of approximately one-third undergraduates and two-thirds graduate students.

In addition, the Office of Graduate Studies (with the assistance from the Association of Former Students (AFS) and other donors) hosts an annual competition to recognize graduate students for their excellence in teaching, research, and service. The AFS Research and Teaching Awards annually recognize approximately 8-10 outstanding graduate students for their scholarship and teaching.

U.S. Senator Phil Gramm Doctoral Award: This award recognizes excellence in scholarly research and teaching. This award comes with a \$5,000 fellowship for doctoral students. Each year 5 to 10 doctoral students receive this prestigious award.

Research and Presentation Grants: This program supports graduate student research or travel by reimbursing students for certain expenses.

Beyond the awards that are managed centrally on campus, there are many more student awards administered by colleges, departments, and organizations (local and national) that have not yet been tallied. The Office of Graduate Studies is in the process of gathering this information to be able to report it centrally in the future, and to use it as an indicator of continuous improvement in the programs.

F. **Student Diversity. Describe plans to recruit and graduate doctoral students who can contribute to the State's goal of diversity in *Closing the Gaps*. Indicate the institution's contributions to the development of a future professoriate that reflects the population of Texas.**

An essential point for Texas A&M's planning in the area of diversity is that success requires an overall commitment to diversity. Thus, this section speaks to Texas A&M's overall efforts to enhance the climate for diversity and to increase the diversity of Texas A&M's faculty and student body.

Texas A&M University Diversity Plan

Although Texas A&M has made gains in broadening the participation of traditionally underrepresented faculty, staff, and students, much work remains to be done. These efforts are guided by an ambitious diversity plan, which was first established in 2006 and was recently updated in 2010.

Many objectives were accomplished during the first phase of the plan's implementation. Specifically, climate assessments for faculty, staff, and students were completed; incoming students were exposed to an increased level of diversity education through new student conferences; a Global Leadership Program was piloted; progressive educational opportunities for faculty and staff were implemented; work toward a comprehensive staff diversity education program grounded in "cultural competencies" began; internal faculty, staff, and student data were gathered and disaggregated by sex and ethnicity, and examined in a five-year trajectory (using 2002 as a baseline); and meetings were conducted with college deans to discuss plans for progress regarding faculty and student presence and quality of life issues.

The *2010 Diversity Plan* (Appendix L) focuses on accountability, climate, and equity (ACE). Texas A&M will hold units *accountable* and reward those who demonstrate progress in creating an environment where the diversity of individual identities and ideas are treated equitably in a climate that fosters success and achievement by all. Texas A&M will attend to *climate* by identifying aspects in the climate of individual units and the University, which foster and/or impede a working and learning environment that fully recognizes, values, and integrates diversity in the pursuit of academic excellence. And Texas A&M will ensure *equity* by integrating into the mission and goals for the University and units, assurance that students, staff, and faculty, regardless of identity, are all treated equitably. Integration is overseen by two high-level groups that serve as institutional structures to keep diversity high among the many priorities: the president's Council on Climate and Diversity and the Diversity Operations Committee.

In a move that advances and demonstrates the firm commitment to diversity, and one that is unparalleled by peers, the vice president and associate provost for diversity will award money to units that excel in areas of the *Diversity Plan*. This money will be added to the unit's base funding and the amount of funding available for distribution will be calculated based on the size of the merit allocation pool for a given year (approximately 10 percent).

V. PLAN FOR FACULTY AND STUDENT DEVELOPMENT *(cont.)*

Full Integration

Diversity is fully integrated into every aspect of Texas A&M's work. It is an Imperative of *Vision 2020*, the long-range vision for excellence at Texas A&M, and it was an overarching theme woven into the development of our Academic Master Plan, which serves as the strategic plan, or roadmap, which incorporates goals, strategies, and metrics to realize key components of *Vision 2020*. Notably, in the area of research, multidisciplinary scholarship and diversity of researchers is emphasized in the area of teaching and learning, the ability to demonstrate cultural and global competence is a proposed learning outcome; and enhancing engagement efforts to meet the needs of an increasingly diverse community is strongly recommended.

Faculty Diversity

A diverse faculty is an essential component of a great university. Though Texas A&M has made progress in this area, there is still a need – and indeed a resolute commitment – to increase the diversity of the faculty. An array of strategies will help accomplish this long-term goal:

Leadership Training.

- Diversity is an explicit component of Texas A&M's orientation program for new academic administrators such as deans and department heads. Because these administrators are so influential in hiring, tenure, and promotion processes, their understanding of and sensitivity to diversity is crucial. This program is developed in collaboration with the Office of the Dean of Faculties and Associate Provost. The Office of the Vice President and Associate Provost for Diversity is also poised to work with the deans of the academic colleges as well as the CEOs of the Texas A&M University at Galveston and Texas A&M University at Qatar campuses in areas related to the recruitment and retention of diverse faculty.
- All hiring supervisors and chairs of searches, award, promotion, tenure, and selection committees are required to attend a program which provides information, education, resources, and assistance that affect hiring, inclusion, climate, and advancement. During search committee training, for example, issues such as cultural understanding and sensitivity throughout the *search, sort, and host* processes, cognitive schemas and errors that influence hiring, and resources on how to build a diverse pool of potential candidates are addressed. These programs are accomplished by working collaboratively with the Office of the Dean of Faculties and Associate Provost, Employee Development, and the Division of Student Affairs.

Faculty Development. The Office of the Dean of Faculties and Associate Provost hosts faculty development seminars that focus on diversity, and the office is home to a number of networks that assist in the recruitment, mentoring, and retention of diverse faculty. These networks include: Black Faculty Alliance; China Faculty Association; Christian Faculty Network; Friends of India Network; Gay, Lesbian, and Transgender Professional Network; Jewish Faculty Network; Mexican American Latino Faculty Association; Muslim Faculty Network; and the Women's Faculty Network, among others. The office also offers seminars that focus on a variety of faculty development and work-life issues such as preparing for promotion and tenure, mentoring, time management, and recruitment and retention for faculty diversity.

Equity Studies. In accordance with the Diversity Plan, a comprehensive faculty equity study will be conducted to evaluate and recommend remedies to any systemic deficiencies in equity, specifically exploring retention, promotion, salary, and job satisfaction.

The Minority and Women Doctoral Directory. To assist in identifying candidates for faculty positions at Texas A&M, the Office of the Vice President and Associate Provost for Diversity will secure and provide this resource to our colleges. The Minority and Women Doctoral Directory is a registry that maintains up-to-date information on individuals who have recently received, or are soon to receive, a doctoral or master's degree in their respective field from one of approximately 200 major research universities in the United States. This valuable resource will assist Texas A&M's effort to recruit women and minority Ph.D.s. into the professoriate.

Student Diversity

During the past five years, there has been an increase in the enrollment of students of color, at both the graduate and undergraduate level. This growth may be attributed to several initiatives that draw upon a talent pool, which reflects the diversity of the state of Texas. Several initiatives seek increase racial, socio-economic, and regional diversity at Texas A&M, and a number of them focus on recruitment into the critical fields of science, technology, engineering, and math at both the undergraduate and graduate levels. There is an overall effort to increase the minority enrollments at Texas A&M at both the graduate and undergraduate levels

Pathways to the Doctorate. This program provides an assistantship to students from the A&M System schools, providing the opportunity to pursue a graduate education at Texas A&M, and in doing so, building relationships with faculty in the department. A mentorship to the student is required of each faculty.

V. PLAN FOR FACULTY AND STUDENT DEVELOPMENT (cont.)

Diversity Fellowship. Financial support (tuition, fees, and graduate employment) is offered to master's and doctoral students who will contribute to the overall diversity of the University.

Minority Recruitment and Retention Leadership Team Funding Initiative. A limited amount of funding is offered to support activities that help recruit and retain African American and Hispanic students. The purpose of the funding program is twofold: to provide seed money to departments creating new recruitment and retention programs and to support the efforts of student organizations to recruit and retain African American and Hispanic students.

NSF Bridge to the Doctorate Program. This program is an extension of The Louis Stokes Alliance for Minority Participation (LSAMP) undergraduate program, which assists students academically and financially so that well-prepared racially underrepresented students can earn their master's degree and be prepared to pursue a doctorate and eventually become a university professor. To support these students, there are monthly seminars covering a diverse range of issues such as research support, utilizing the library, as well as information on personal finances and life skills. Students are tracked to ensure that they are being prepared successfully.

Century Scholars. This is a targeted initiative that seeks to increase the racial diversity of Texas A&M, by targeting students in Texas from specific schools that have a reputation for graduating well-prepared students. The schools that are eligible to have students receive the scholarship are in the Dallas, Houston, San Antonio, and Rio-Grande Valley areas. The students that receive this scholarship are awarded \$20,000 (over the course of four years). Century Scholars also have a number of support activities and meetings to support them through their college experience.

Project Ph.D. Housed in the Mays Business School and designed for graduate students, this initiative seeks to recruit more students of color into graduate school to pursue a Ph.D., so that they can become professors. This is a multi-institutional initiative that offers fellowships to promising students.

The Lone Star Graduate Diversity Colloquium. This program is one means to further the statewide *Closing the Gaps* initiative. It is a collective effort by a number of colleges and universities in Texas to encourage more underrepresented ethnic minorities, women, and first generation college students currently enrolled at Texas colleges and universities to stay in Texas to complete their graduate education.

Regent's Scholarship. Regent's Scholarship is a need-based aid program that serves students who are both first generation college students and have a family

income of less than \$40,000. This program provides about \$5,000 in aid each year for students, and requires students to live on campus, participate in a learning community, and participate in an orientation program (all designed to help these students succeed).

Aggie Assurance. Announced in 2008, young Texans who are eligible for admission to Texas A&M and whose families have incomes of \$60,000 or less are now guaranteed by this new program that their tuition will be covered at no cost to them. The program encourages Texans to pursue higher education at a flagship research institution and is designed to reassure students from low-and middle-income families in Texas that a college education is possible, especially at Texas A&M. As part of its land-grant mission for the state, Texas A&M is committed to providing affordable access.²⁰

Prospective Student Centers (PSCs). Strategically located in areas with greater populations of traditionally underrepresented students, admissions and financial aid staff assist prospective students by providing information about Texas A&M and by providing counsel regarding the application process. (See also, Section III.B.)

Recruitment Coordination Team (RCT). This team, involving key administrators, Corps of Cadets, Financial Aid and Scholarships, Honors, Student Affairs, the Prospective Student Centers, and other University offices meets on a regular basis to ensure strategic, consistent, well-informed, aligned recruitment efforts. This group also works to ensure that the admissions process is highly coordinated with the academic colleges, so faculty can discuss expectations of incoming students as well as the prerequisite high school coursework.

These initiatives represent a select few that seek to improve faculty and student diversity. To view others, please visit the Office of the Vice President and Associate Provost's website.²¹

Climate

To gain a deeper understanding about how faculty, staff, and students "experience" Texas A&M, the Office of the Vice President and Associate Provost for Diversity collaborates with the Office of the Dean of Faculties and Associate Provost, the Department of Human Resources, the Office of Graduate Studies, and the Division of Student Affairs to assess the climate with regard to diversity. The Vice President and Associate Provost for Diversity ensures that questions asked, on the audience-specific instruments, will yield data that will inform current and future diversity initiatives.

²⁰ <http://www.aggienetwork.com/CampusNews/AgAssurance/?PageID=2212>

²¹ <http://diversity.tamu.edu/>

V. PLAN FOR FACULTY AND STUDENT DEVELOPMENT (cont.)

The Community

Texas A&M will actively work to assist with addressing issues outside as well as inside the University. Although the University cannot control all of the external variables that impact the campus climate, it is an advantage to form positive working relationships with appropriate community groups in Bryan-College Station to work together to enhance positive relationships and reduce issues such as racism, xenophobia, homophobia, religious discrimination, and Islamophobia. Sociohistorical forces that occur outside of college campuses can foster critical and positive conversations on campus. In addition, external forces in the community combined with internal forces on campus contribute to the campus climate.

The 2010 Diversity Plan calls for continuation and acceleration of efforts to recruit and retain diverse faculty and student bodies, and will hold units accountable in both processes and results. The Vice President and Associate Provost for Diversity, in collaboration with the Council on Climate and Diversity, will monitor, evaluate, and reward progress in these critical steps toward excellence.

VI. OTHER RESOURCES

The institution's plan should address, at a minimum, the following elements:

A. *Research facilities.* Describe significant projected additions to the institution's facilities related specifically to research, including timelines for completion.

Collaboration between Texas A&M, Texas Transportation Institute, and other Texas A&M University System agencies allows the University to capitalize on laboratories and facilities with minimal additional expenses. The University has also partnered with AgriLife Research to build a world-class Nuclear Magnetic Resonance Imaging Center and to hire faculty to leverage this strategic investment. AgriLife Research has also invested more than \$2M in infrastructure to support cutting-edge research in genomics.

Texas A&M University has a strong research program in infectious diseases that affect humans and animals. Much of this cutting edge research must be conducted in biosafety level 3 (BL3) laboratories. While the Office of the Vice President for Research has overseen an extensive program to extend the length of time these facilities may be used safely, existing BL3 laboratories are currently fully occupied and are nearing the end of their service life. To accommodate both the growing need for BL3 space and to replace gaining facilities, new BL3 laboratory space is needed. Discussions have begun involving several parties in the University and the A&M System

to address this growing need for BL3 research facilities that would allow expanded and more efficient operations.

A complete list of recent projects and those currently under construction is in Table III.

B. *Library resources.* Describe plans to enhance the libraries, including facilities, equipment, digital resources, and collections. Describe specifically how the plans to enhance library resources are related to improving existing doctoral programs and supporting new doctoral programs.

The Texas A&M Libraries strategic plan includes many key elements to enhance library resources and capabilities that support the improvement of existing doctoral programs and new doctoral programs.

A key element to the Libraries' strategic plan is the advancement and support changes in scholarly communications in a way that supports the faculty and students at Texas A&M. This is achieved by providing publishing and documentation support that ensures that Texas A&M research results are disseminated and archived for the benefit of the scholarly community and society at large. Using the Texas Digital Library project as the primary platform, the Libraries seek to develop and preserve digital collections, including building and maintaining digital repositories and managing datasets, in order to facilitate intellectual access to digital objects.

Another key element is enhancing the customer centered orientation of library services by developing effective modes for marketing library services, especially those delivered electronically; developing effective virtual reference/information services to support library users outside library facilities, including improvements to interlibrary and document delivery services; identifying and tailoring services to specific sectors of the Texas A&M community; and enhancing measures for assessing effectiveness of library services.

An additional key element is to build collections of distinction. As opportunities and user needs warrant, move collection development into the electronic environment in order to enhance user access to information resources for teaching, learning, and research. In addition, develop print collections in targeted areas that best serve user needs, especially collections of rare or unique materials which support research, and make the content of those collections both intellectually accessible through national bibliographic databases and, when warranted, physically accessible via digitization.

The last key element to the Texas A&M Libraries strategic plan is to manage facilities and physical collections to support research and teaching and to

VI. OTHER RESOURCES (cont.)

maximize efficiency of materials storage. The Libraries will work to develop inter-institutional joint storage opportunities for managing little used materials, especially development of a joint Texas A&M University System/University of Texas System project for a joint storage facility on the Riverside Campus which could serve as the model for statewide shared storage of library collections.

With reference, specifically to graduate education, the Thesis Office in the Office of Graduate Studies oversees the review of dissertation and thesis manuscripts, and once approved by the student's committee, uploads these documents to the electronic thesis repository hosted by the library. To assist the processing and submission of these electronic manuscripts, the University is using a portal called Vireo which is used to upload the student's manuscripts for review and approval before it is forwarded on to the electronic thesis repository. It is critical for the library to continue to maintain and upgrade these digital resources in support of our graduate students.

As warranted, the Libraries will repurpose existing spaces in library facilities from materials storage to public use, concentrating on development and support of collaborative learning and instructional space for information literacy efforts.

The Texas A&M Libraries' goal, in alignment with *Vision 2020: Creating a Culture of Excellence*, is to be ranked in the top 20 of Association of Research Libraries (ARL) Libraries and top 10 of ARL U.S. Public University Libraries by 2020. Since 1999, the Libraries' rank among ARL libraries has increased 21 percent, and its rank among ARL U.S. Public University Libraries has increased 36 percent (Appendix M).

Since 2003/2004, the Texas A&M Libraries has implemented significant enhancements in library services and facilities as follows:

- Led development of the Texas Digital Library, a joint project with the University of Texas at Austin, which is now providing a suite of digital library services to faculty and students in some 18 institutions throughout Texas;
- Supported A&M System members by negotiating extensions of electronic resources licenses, allowing access to computerized files to member schools at either no cost or at substantially reduced cost;
- Made significant purchases for the Cushing Library in fields of Don Quixote, Mexican Colonial Era, John Donne, 18th century French literature, and Walt Whitman;
- Partnered with The University of Texas at Austin to build a 1.3M volume storage facility in Austin,

which the two libraries will share for maintaining valuable, but little used print volumes;

- Extended availability of library study spaces by opening two main library facilities (Library Annex and West Campus Library) on a 24/5 basis Sunday through Friday;
- Enhanced study environment by: creating two silent study facilities in Evans and West Campus libraries; adding 15 group study rooms in various locations in the library system (Evans, WCL, MSL) making 54 individual study rooms available to users for short term checkout; providing 100 laptop computers for users on short term checkout; installing campus Open Access Lab computer workstations throughout all library facilities; and renovating the first floor of Evans Library both to provide improved quiet study and to make available effective collaborative study space;
- Increased productivity of all Texas A&M faculty, staff, and students by: implementing document scanning services for all Texas A&M students, faculty, and staff; implementing book paging for all Texas A&M students, faculty, and staff; implementing book delivery to faculty offices; and implementing expanded media production capabilities for library users.

C. **Graduate student support. Describe plans to provide competitive financial support to graduate students including teaching assistantships, research assistantships, and fellowships for the targeted doctoral programs identified in the strategic plan.**

The overall support of graduate students at Texas A&M has grown over the past five years from a total of \$48.8M in 2003, to a total of \$61.9M in 2008. This growth is being fueled by both a growth in enrollments requiring additional Graduate Assistant Teachers (GATs) lines and a more modest growth in extramural funding for Graduate Assistant Researchers (GARs). Currently, Texas A&M provides approximately \$37M annually in support of GATs and approximately \$25M in support of GARs.

The Office of Graduate Studies coordinates the tuition scholarship program for eligible graduate students. The program provides for in-state, resident tuition payments for graduate assistants involved in teaching (GATs) along with graduate assistants working in areas closely associated with their academic field of study (Graduate Assistants–Non-teaching, or GANTs) and GARs, whose tuition is not allowed by grant sponsors. The program provides approximately \$10.5M in payments to cover tuition for graduate students each year. This program improves the

VI. OTHER RESOURCES (cont.)

ability of Texas A&M to attract the highest caliber graduate students. However, it must be noted that the tuition payments do not cover mandated University fees, which may total \$1,000 per semester. The absence of a fee waiver substantially and adversely limits graduate recruitment for top-quality students. For GARs supported by external funding, the grants are required to provide tuition coverage equivalent to that of GATs. In some cases, grants may also pay the students' fees in an attempt to keep stipends as competitive as possible.

One area where Texas A&M has identified the need for further resources is for graduate student support. In order for offer packages to be competitive, Texas A&M must find the resources needed to increase the base stipends on the order of \$5-10K per year, as well as find resources to support increasing tuition and to cover fees (these are not covered at this time with tuition scholarships). Texas A&M would first target the Graduate Merit Fellowship program to be more competitive with other universities. These awards are targeted for attracting the best and brightest students to further entice these students to matriculate at Texas A&M. To support these improvements to the current program, which supports 30 students annually, would require an additional \$600,000, and to add additional fellowship slots at this funding level would cost an additional \$55,000 each to fund at this level.

In addition to graduate student funding issues, another area of concern is the availability of affordable housing options for graduate students. To provide housing for our international students, who often come to Texas A&M with their families, the University needs to continue to provide moderately priced housing to meet their needs.

The Office of Graduate Studies has a recruiting office that works with various faculty and graduate programs to recruit incoming students. In addition, this office attends various graduate school fairs around the country to provide information to interested students about the wide range of graduate programs. Once a contact has been made with a prospective student, Texas A&M informs the relevant department for continued information. In addition, OGS also supports a number of competitive fellowship programs that can be used to attract the best graduate students to the programs. These programs are outlined briefly below:

Pathways to the Doctorate Fellowships. Through the Pathways to the Doctorate program, several members in the A&M System are making assistantships or scholarships available to students from within the A&M System wishing to pursue graduate study at Texas A&M University in College Station. To qualify, students must be from a different institution within the A&M System.

Graduate Merit Fellowships/The Association of Former Students Fellowships. These fellowships are awarded through a University-wide competition. The fellowships are designed to encourage high-quality applicants to enroll for the first time in graduate programs at Texas A&M. The departments make nominations to OGS and these awards are given for one year.

Graduate Diversity Fellowships. This fellowship aims to attract students to Texas A&M who have a proven record of success in a diverse environment. Academic departments nominate prospective graduate students, and students are selected based on overall merit and the nominating department's statement of support. The fellowship provides funding for two years for master's students and three years for Ph.D. students, and includes for each year: \$13,000 stipend, \$8,000 for tuition and fees, and a departmental assistantship, which pays a minimum of \$7,569 per year. With the graduate assistantship, the student has an option for health insurance at a nominal cost.

VII. NATIONAL VISIBILITY

Identify any existing or projected programs and resources, not already identified above, to increase the national visibility and research reputation of your institution.

Over the last decade, Texas A&M has worked to identify and accomplish strategic initiatives which have propelled our capabilities in research and reaffirmed the University's heritage of infusing discovery in the classroom experience for students.

Texas A&M has finalized the unprecedented faculty reinvestment program, which brought over 450 new faculty to the University. This is a tremendous asset of expertise and experience that will provide great dividends to the state. As many of these faculty are still advancing through their career, Texas A&M will continue to facilitate a robust set of career development processes and programs to ensure their impact on the teaching, research, and service missions.

As a leader in research productivity, including a top 20 ranking by the nation's leading research authority, the National Science Foundation, Texas A&M must continue to employ the highest standards of compliance and administration. Issues of research compliance and the ability to ensure safety, quality, and accountability remain among the highest priorities for research excellence. Texas A&M will enhance the existing practices and allocate resources in support of research compliance and administration.

In addition to the specific strategic research initiatives that have been discussed in other sections of this report, Texas A&M remains mindful of evolving needs and opportunities for research that may

VII. NATIONAL VISIBILITY (*cont.*)

emerge. Texas A&M will continue to improve its ability to respond to national research initiatives through strategic engagement of federal agencies and national associations of the land grant and Tier One research institution peers. Additionally, Texas A&M is working to build on existing partnerships and create new corporate and industry partnerships to address issues that affect the business enterprise of Texas.

As a comprehensive university, Texas A&M recognizes the solutions needed in technology, science, and engineering will need to be joined to the study of people and behaviors. Through thorough and strategic investment Texas A&M will ensure the programs in arts, humanities, and social sciences have resources and opportunities that enable positive growth and output.

Finally, to ensure visibility for the research productivity and history of accomplishment, Texas A&M will continue to communicate and promote the efforts of the faculty. Texas A&M's colleges promote specific college research activities through well-placed press releases, weekly columns such as *Pet Talk*, guest appearances on radio and television, college publications, and well-pitched stories. The Division of Research and Graduate Studies, in turn, produces an annual University-wide research magazine, *Advance*, focused on the leading research projects in each of the colleges. This magazine increases the awareness to funding agencies and other decision-makers about the scope of research performed at Texas A&M, showcases Texas A&M researchers and the caliber of their research, highlights the value of the research mission of Texas A&M to the local community, and provides outreach and service to the state and the nation. Through the colleges, the Division highlights Texas A&M's commitment to research and scholarship that is innovative and beneficial to the public well-being. As an additional service to the colleges, the Division maintains a website that showcases research projects with podcasts as well as an RSS feed for research news. The Division of Research and Graduate Studies also produces press releases on current and innovative research activities and assists the colleges in promoting their researchers and gaining prominent attention for their research projects.

Texas A&M will support faculty recognition opportunities and utilize national peer association promotion opportunities such as the Association American Universities and the Association of Public and Land Grant Universities' new website that highlights ARRA research investment, ScienceWorksforUs.com.

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TABLE I

College Academic Strengths and Research Priorities

| | |
|---|---|
| Agriculture and Life Sciences | |
| | Fundamental Biology |
| | Food: Security, Safety, Nutrition, and Health |
| | Prosperity of Agricultural Systems |
| | Healthy Ecosystems and Conservation of Natural Resources |
| | Bioenergy and Alternative Energy |
| | Communities, Families, and Youth |
| Architecture | |
| | Health: Develop evidence-based design guidelines to ameliorate the negative impact of the physical environment on health and safety |
| | Visualization: Create a commorancy where art and science enable visually-mediated understanding |
| | Sustainability: Develop robust tools to assess the efficiency, resiliency and vulnerability of real-world ecosystems across spatial scales |
| Bush School of Government and Public Service | |
| | Public Policy |
| | Public and Nonprofit Management |
| | National Security Affairs |
| | International Transactions and Development |
| Mays Business School | |
| | Accounting: Financial Reporting, Taxation, Corporate Governance and Ethics |
| | Finance: Corporate Risk Management, Firm Valuation, Impact of Regulations on Firms and Markets |
| | Marketing: Electronic Commerce, Consumer Behavior, Healthcare Services |
| | Management: Innovation and Entrepreneurship, Corporate Strategy, Managing Human Capital |
| | Supply Chain and Information Systems: Improving Supply Chain Security, Technology Management, Designing Information Systems Education and Human Development |
| | Elimination of Educational and Health Disparities |
| | Health and Wellness |
| | Learning and Teaching Sciences |
| | Preparation of Education, Health, and Human Resources Development Practitioners |
| | Social and Behavioral Science Research Methodologies |
| Dwight Look College of Engineering | |
| | Energy, Water, and Environment |
| | National Security |
| | Health Care |
| | Infrastructure and Transportation |
| | Informatics and the Knowledge Economy |
| Geosciences | |
| | Climate Research from Dean to Future Time |
| | Sedimentary Geology and Geobiology |
| | Coastal Processes |
| | Coupled Natural-Human Systems |
| | Geoscience Education |
| Liberal Arts | |
| | Diversity and Society |
| | Governance, Social Institutions, and Behavior |
| | Culture and Change |
| | Transnationalism, Globalization, and International Systems |
| | Health, Human Wellness, and Health Care |
| Science | |
| | Biological Clocks |
| | Catalysis |

| |
|---|
| Modeling and Computational Science |
| Inorganic Chemistry and Materials |
| Instrumentation |
| Mathematical Analysis |
| Molecular Design and Synthesis |
| Nuclear Science |
| Quantum Science |
| Cosmology |
| Veterinary Medicine and Biomedical Sciences |
| Cardiovascular Sciences |
| Biomedical Genomics |
| Veterinary Clinical Research |
| Infectious Diseases and Biodefense |
| Neuroscience |
| Reproductive Biology |
| Toxicology, Oncology, and Environmental Health Sciences |
| Texas A&M University at Galveston |
| Marine Sciences and Marine Biology |
| Engineering Science – thermodynamics, corrosion, remote sensing systems, robotics |
| Sustainable Coasts and Marine Policy |
| Biofuels |
| Oceans and Human Health |
| Texas A&M University at Qatar |
| Water management and sustainability. |
| Oil and gas recovery, properties, and safety. |
| Processing of acid/sour gas and liquefied natural gas. |
| Wireless technology: multimedia transmission and communications. |
| Innovative materials with tailored microstructures. |
| Polymer chemistry and synthesis. |
| Alternative energy: fuel cells, PV cells, hydrogen technology, solar power. |

TABLE II**Initial University Multidisciplinary Research Initiatives (2009)****Biological Structure and Control**

Bacteriophages (or “phages”), which are viruses that kill bacteria, coupled with modern DNA-based biotechnology, have enormous potential as “green” anti-bacterial agents. Applications include combating bacterial infections in humans, animals and plants; protection against terrorist bioweapons; food safety; and prevention of bacterial contamination, degradation and corrosion in key sectors of the economy, such as energy generation and delivery.

Digital Humanities, Media, & Culture

Two related grand challenges are addressed: how computing technologies and culture interact, and how cyberinfrastructure can revolutionize humanities and social sciences. Research is focused in four interrelated areas in the digital age – the cultural record, cultural systems, cultural environments, and cultural interactions.

Applied Mathematics and Statistics

Disruptive technologies – and the massive amounts of data they produce – are causing a generational shift in the research paradigm. The key to harness these technologies – applied mathematical, statistical, and computational paradigms – will enable new understanding and ultimately practical solutions to problems previously intractable.

Neuroscience

Understanding neural function – a multidisciplinary examination ranging from molecular systems to cognition and behavior – is the basis for finding causes and treatments of neurological disorders that impact society. Research will foster cures and therapies for addiction, Alzheimer’s sleep disorders, and recovery from neural injury.

Nuclear Solutions for the 21st Century

Nuclear development offers a wealth of opportunities for enhancing quality of life through medical breakthroughs and energy production, but it also contains seeds for societal destruction. Multidisciplinary strengths in basic and applied nuclear science and nuclear policy development will lead to new approaches and technologies for realizing common good.

Quantum Science and Engineering

Quantum mechanics, the crowning achievement of 20th century physics, is yielding phenomenal insights and technologies in the 21st century, ranging from deep insights in philosophy, to engineering advances in lithography and microscopy, to breakthroughs in computation and alternative energy.

Renewable Energy and Sustainability

The growing consumption of petroleum products in light of finite deposits, coupled with escalating concern for climate change from burning fossil fuels, has created the grand challenge to find clean and renewable energy sources as well as improved conservation strategies. Research brings to bear a variety of strengths in alternative energy, conservation technologies, and public policy.

Whole Systems Genomics for Improved Human, Animal, and Environmental Well Being

The genomics revolution is reshaping the world in fundamental ways. Its contributions to the advancement of agricultural productivity and human and animal health have influenced economics, policy, ethics, geography, and business. Research in whole systems genomics is aimed at human and animal well-being and improved environmental stewardship.

TABLE III**New Facilities with Research/Research-Related Functions ***

| |
|---|
| Emerging Technologies and Economic Development (Engineering/Interdisciplinary) |
| Will provide space for research in emerging technologies through interdisciplinary collaboration among researchers in multiple colleges |
| Funding - \$104M funded by PUF and RFS |
| Site - Corner of Bizzell and University Drive |
| Construction Start Date - 12/1/2008 |
| Construction Completion Date - 8/17/2011 |
| Veterinary Research Building Addition |
| Three-story addition that will allow for 26 research labs |
| Funding - \$25.4M funded by AUF, RFS, Vet. Med and TEES |
| Site -Veterinary Medicine Complex at Agronomy Road and University Drive |
| Construction Start Date - 2/28/2008 |
| Construction Completion Date - 2/28/2010 |
| Nuclear Magnetic Resonance (NMR) Facility |
| Will house nuclear magnetic resonance spectrometers and three floors of biochemistry labs |
| Funding - \$15.4M funded by PUF, AUF and other University Funds |
| Site - West Campus |
| Construction Start Date - 11/13/2008 |
| Construction Completion Date - 3/26/2010 |
| Veterinary Imaging and Cancer Treatment Center |
| Will contain a linac radiation, computerized radiation therapy planner, MRI Image viewing, anesthesia and recovery rooms |
| Funding - \$4.5M funded by AUF |
| Site - Veterinary Medicine Complex at Agronomy Road and University Drive |
| Construction Start Date - 3/29/2010 |
| Construction Completion Date -7/29/2011 |
| Texas AgriLife Research - Agriculture Headquarters Building |
| Will encompass education, research and administrative facilities to foster teaching, research, and extension efforts |
| Funding - \$62.4M funded by PUF, RFS and other source funds |
| Site - near intersection of Discovery Drive and Kimbrough Blvd. |
| Construction Start Date - 5/4/2009 |
| Construction Completion Date -2/14/2011 |
| National Center for Therapeutic Manufacturing |
| Funding - \$40.5 funded by PUF and Federal funds "legislative appropriations" |
| Site - Near intersection of Discovery Drive and University Drive |
| Construction Start Date - 3/30/10 |
| Construction Completion Date - 11/2011 |

*Facilities include those supported by funding from Texas A&M University and The Texas A&M University System agencies.

TABLE IV**Research Centers**

| Center / Institute Name |
|---|
| Advanced Telecommunications and Learning Technologies, Academy for |
| Agricultural Air Quality Engineering and Science, Center for |
| Agricultural and Food Policy, Center for |
| Alcohol and Drug Education Studies, Center for |
| Applied Creativity, Institute for |
| Approximation Theory, Center for |
| Atmospheric Chemistry and the Environment, Center for |
| Biological Clocks Research, Center for |
| Biological Nuclear Magnetic Resonance, Center for |
| Cardiovascular Research Institute |
| Chemical Characterization and Analysis, Center for |
| Chevron Center for Well Construction and Production |
| Coal and Lignite Research Laboratory |
| Collaborative Learning Communities, Center for |
| Comparative Medicine, Center for |
| Construction Education, Center for |
| Cooperative Institute for Applied Meteorological Studies (CIAMS) |
| Countermeasures Against Agricultural Bioterrorism, Institute for |
| Crisman Institute for Petroleum Research |
| CRS Center for Leadership and Management in the Design and Construction Industry |
| Cyclotron Institute |
| Development and Molecular Biology, Institute for |
| Disability and Development, Center for |
| Distance Learning Research, Center for |
| Earth Resources Institute |
| Electrochemical Systems and Hydrogen Research |
| Energy and Mineral Resources, Center for |
| Energy, Environment, and Transportation Innovation, Center for |
| Engineering Geosciences |
| Environmental and Rural Health, Center for |
| Environmental Research Center |
| Equine Business Studies, Center for |
| European Union Center |
| Executive Development, Center for |
| Food Protein Research and Development Center |
| Food Safety, Center for |
| Foreign Animal and Zoonotic Disease Defense, National Center for |
| Genome |
| Geochemical & Environmental Research Center |
| Source: http://vpr-webserver.tamu.edu/testing/centers/ |
| Geodynamics Research Institute |
| George P. and Cynthia W. Mitchell Institute for Fundamental Physics |
| Geosciences & Earth Resources Foundation |
| Glasscock Center for Humanities Research |
| Greyhound Medicine |
| Halliburton Center for Unconventional Resources |
| Hazard Reduction and Recovery Center |
| Health Systems and Design, Center for |
| Heritage Conservation, Center for |

| |
|---|
| High Energy Physics Research Center, |
| Homeland Security, Integrative Center for |
| Housing and Urban Development, Center for |
| Human Resource Management, Center for |
| Information Assurance and Security, Center for |
| International Business Studies, Center for |
| International Institute for Theoretical Physics |
| Internet 2 Technology Evaluation Center |
| Large-Scale Scientific Simulations, Center for |
| Leadership in Higher Education |
| Management of Information Systems, Center for |
| Marine Life Sciences, Center for |
| Maritime Archaeology and Conservation, Center for |
| Mathematics and Science Education, Center for |
| Mexican American and U.S. Latino Research Center |
| Michael E. DeBakey Institute for Comparative Cardiovascular Science and Biomedical Devices |
| Microencapsulation and Drug Delivery, Center for |
| Military Studies Institute |
| National Security Education and Research, Institute for |
| Natural Resource Information Technology, Center for |
| New Advanced Biomolecular Research, Center for |
| New Ventures and Entrepreneurship, Center for |
| Norman E. Borlaug Institute for International Agriculture |
| Nuclear Security Science and Policy Institute |
| Obesity Research and Program Evaluation, Institute for |
| Pacific Asia, Institute for |
| Plant Genomics and Biotechnology, Institute for |
| Principals' Center |
| Private Enterprise Research Center |
| Public Leadership Studies Institute |
| Public Policy Research Institute |
| Quantum Studies, Institute for |
| Race and Ethnic Studies Institute |
| Source: http://vpr-webserver.tamu.edu/testing/centers/ |
| Real Estate Center |
| Renewable Natural Resources, Institute of |
| Retailing Studies, Center for |
| Schlumberger Center for Reservoir Description and Dynamics |
| Science, Technology and Public Policy, Center for |
| Scientific Computation, Institute for |
| Scowcroft Institute of International Affairs |
| Shubot Exotic Bird Health Center |
| Socioeconomic Research & Education, Center for |
| Sport Management Research and Education, Center for |
| State Technical Services Institute |
| Statistical Bioinformatics, Center for |
| Stevenson Companion Animal Life-Care Center |
| Study of Health Disparities, Center for |
| Study of the First Americans, Center for the |
| Surface Science and Catalysis, Center for |
| Sydney and J. L. Huffines Institute for Sports Medicine and Human Performance |
| Technology Commercialization Center |

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| Tectonophysics |
| Texas Center for Climate Studies |
| Texas Institute for Preclinical Studies |
| Texas Veterinary Medical Center |
| Texas Water Resources Institute |
| Theoretical Physics, Center for |
| Urban Affairs, Center for |
| Vegetable and Fruit Improvement Center |