



Section 2

Academic Initiatives and Plans

This section focuses on the programmatic elements of the Budget Plan, describing the principal planning issues in the schools, major labs and institutes, and academic support areas.

GRADUATE SCHOOL OF BUSINESS

The Graduate School of Business (GSB) will remain under a high degree of competitive and financial pressure in 2003/04. Competition to attract the best people, particularly faculty and students, remains very high. While the school has made some difficult decisions to restructure services or postpone projects, the GSB will continue to invest in the key elements of its program: recruiting and retaining the next generation of faculty, developing new research initiatives such as a Center for Leadership Development and Research and the Center for Global Business and the Economy, continuing to invest in cross-disciplinary and cross-school efforts such as the Center for Social Innovation, and supporting key services for students and alumni.

The school's programmatic priorities for 2003/04 include:

Teaching and Research

FACULTY AND RECRUITING – Recruiting efforts will focus on hiring faculty to replace retirements and turnover, with no net growth in faculty.

RESEARCH CENTERS – The GSB continues to realize benefits from existing research centers. The school plans to raise funds for two of the current centers — the Center for Entrepreneurial Studies (CES) and the Center for Social Innovation (CSI). Each center provides a focal point for teaching, research and outreach in a particular area of faculty interest.

The newest center, CSI, secured initial funding from foundations and individual alumni and has expanded its activities in the past year. The Center is both cross-

disciplinary and cross-school. Some recent activities include: Executive Programs for Nonprofit Leaders and the Stanford Social Innovation Review, the Stanford Project on Emerging Nonprofits, and the Stanford Educational Leadership Initiative, which is a joint program between the GSB and the School of Education. CSI also manages the Public Management Program, which supports courses and student programs; the Stanford Management Internship Fund, which supports MBA's who work with nonprofit organizations during their summer internships; and the Alumni Consulting Teams, which provide *pro bono* advice to nonprofit organizations.

In addition, the school plans to launch both the Center for Leadership Development and Research, and the Center for Global Business and the Economy in 2003/04. There is considerable interest among faculty, students, and alumni to have the GSB focus on these important business topics through research centers.

Student Services

Given the difficult economy, particularly locally, the demand for career services is very high, for both students and alumni. In addition, the needs of international students require specialized attention that the GSB is providing for the first time to its students from overseas.

The GSB estimates a shortfall of fellowship funds for both 2002/03 and 2003/04 and possibly into the future. The weak economy along with tuition and fee increases has caused a substantial increase in student need levels. The school is committed to providing need-based support and efforts are underway to raise additional fellowships to meet these needs.

Alumni Services

The GSB is engaging alumni more than ever before. In addition to the very popular reunions and conferences held for many years, there are new ways for alumni

to engage with the GSB. Through a focus on lifelong learning, the school is creating opportunities for alumni to tap its knowledge base. The school is developing a CD-ROM based faculty seminar series and is also providing many interesting web-based resources including videos of faculty and other guest speakers, discussion topics, and library database access. The GSB is also using alumni in admissions and in new student orientation, as interviewers and as mentors to help incoming students understand both the culture of the GSB as well as the obligations and responsibilities that come along with a Stanford MBA.

Executive Education

The GSB has developed a new program in Corporate Governance. The school is also developing new custom programs for existing and new executive education customers. In addition, the school will continue efforts to develop CD-ROM-based takeaway course modules and educational materials that reflect the interests of its faculty. Joint efforts to develop and market these types of products with the Harvard Business School have enjoyed some success and will continue.

SCHOOL OF EARTH SCIENCES

The School of Earth Sciences has plans for a number of programmatic priorities. Paired with these priorities are a number of challenges. The school faces a potential for eight faculty retirements by 2005. In addition to the efforts it will take to identify and recruit the best replacements, start-up, lab renovation, and recruitment costs will be substantial. Current projections run as high as \$4.8 million. Existing school reserves will not be large enough to cover these costs. The school also feels that faculty retention could be a problem. Despite aggressive salary programs for the past two years, significant gaps still exist with faculty salaries in comparison to peer institutions.

The school has several facilities issues. Funds will be needed to solve some pressing space issues for the Interdisciplinary Program in Environment & Resources (IPER), as well as storing its research and teaching collections. Unrestricted funds held as reserves at the dean's level have been used to address a number of critical issues, including last year's general funds reduction, faculty salaries, and lab renovations.

The school plans to launch or further develop the following academic initiatives:

STANFORD'S INITIATIVE ON THE ENVIRONMENT – The School of Earth Sciences is playing a leadership role in the “Environmental Initiative,” an exciting and dynamic program cutting across campus units and focusing on environmental and sustainability issues. The schools of Law, Engineering, H&S, and the Institute for International Studies, together with Earth Sciences, are working hard to find ways to build on combined strengths and integrate them across disciplinary borders. It is clear that a campus-wide “institute for the environment” is getting closer to becoming reality, but Earth Sciences will continue to require resources to maintain and strengthen its contribution to the cross-campus program. In the longer run, the school will need resources to expand and support new faculty positions and research and teaching collaborations. Now, however, it is contributing to the initiative in three important ways: IPER, Earth Systems and GCEP.

INTERDISCIPLINARY PROGRAM IN ENVIRONMENT AND RESOURCES – This new interdisciplinary program began in 2002/03 and anticipates thirteen students for 2003/04. It is currently funded by a grant from the Luce Foundation, which will expire in 2004/05.

EARTH SYSTEMS PROGRAM – This interdisciplinary program continues with over 130 undergraduate and co-terminal Masters students. Although funds have been raised to support the program, they are not adequate to meet basic operational needs.

GLOBAL CLIMATE AND ENERGY PROJECT (GCEP) – This is a recently launched interdisciplinary research program, housed within the independent labs, centers, and institutes of the Dean of Research. The program should be self-sufficient as soon as contract funding commences. In the meantime, start-up funds have been requested.

UNDERGRADUATE TEACHING – Two of the school's departments are making great efforts to reinvigorate their undergraduate programs. They will need resources in order to be successful.

In addition to these priorities, the school will be embarking on a strategic planning exercise during the 2003/04 academic year. The school is under new leadership and has experienced close to a 30% turnover in faculty over the past six years. It is an appropriate time to establish a new vision and goals for the next decade, especially since it will see a significant number of faculty retire over the next two years.

SCHOOL OF EDUCATION

Over the next year the School of Education will focus on three programmatic goals: 1) to develop new programs and to refine existing academic programs; 2) to increase the visibility of the work being done to improve education and communities for youth; and 3) to expand its efforts in the area of learning and technology. Challenges facing the school include the recruitment of top faculty and students to the Bay Area and its high cost of living; the expansion of research and professional development programs given the limitations on space and infrastructure; and the growing demands for technology support.

The school will design a model elementary teacher education program which will prepare teacher leaders, drawn from Stanford undergraduates, who share a set of core values that include a commitment to social justice, an understanding of the strengths and needs of a diverse student population, and a dedication to equity and excellence for all students. Stanford juniors accepted to the program will take courses in their junior and senior years before entering the fifth year MA/credential program. The first juniors will be accepted into the program's course series beginning in fall, 2003. The Administrative Policy Analysis and the Prospective Principals' programs have been put on hold while they are reviewed and revised.

School of Education projects that involve sustained partnerships with practitioners and policy makers include:

- Policy Analysis for California – a cooperative effort with UC Berkeley's School of Education to provide analysis and assistance to state policy makers,
- Stanford Center on Adolescence – a research center which promotes interdisciplinary research related to adolescents,
- Charter High School in East Palo Alto – a professional development school for Stanford's Teacher Education Program,
- Stanford Institute for Higher Education Research – a research center which examines contemporary higher education planning and policy issues from a wide range of analytical perspectives, and
- MacArthur Network on Teaching and Learning – a network to share knowledge on research and

development and to examine strategies for connecting research and development with practice.

A new doctoral program, Learning Sciences and Technology Design, launched in fall 2002, attracts a talented and diverse set of students. The learning sciences are dedicated to the study and design of psychological, cultural, and technological processes that support learning. Another area of technology focus, the Secondary Teacher Education Program, continues to be a challenge. To keep pace with new opportunities for using technology to enhance education, the school has invested resources to integrate technology into the curriculum and to offer technology training to the students in the Teacher Education Program. To support these and other technology initiatives, the school has made a substantial investment to support the infrastructure needed to provide service and tools to the varied programs within the School of Education.

To address a severe space shortage and to gain visibility for partnership programs with practitioners and community leaders, the school hopes to raise the funds needed to reconstruct the former Career Development Center Building. Projects that will be housed in the new building include the California School Redesign Network and Performance Assessment Collaborative - an initiative to serve practitioners throughout California by assisting them in designing schools and by conducting research on small school designs and outcomes; and the John Gardner Center for Youth and Their Communities – a center inspired by the late John Gardner in which Stanford faculty and students work with community leaders to create communities that promote healthy youth development.

SCHOOL OF ENGINEERING

The School of Engineering is deeply involved in several new initiatives that will position it to continue its future leadership in engineering research and education. Virtually all of these initiatives are multidisciplinary and will leverage expertise and potential across departments, schools and disciplines at Stanford. While the school will maintain and build upon historical strengths in information sciences, it plans to invest significant resources in programs focused on bioengineering, environment and energy, nanotechnology, photonics, and computational mathematics and engineering. The challenges Engineering experiences are those associated with the budget issues facing the entire institution. The school is challenged to maintain

its basic teaching and research mission along with a quality of life for Engineering departments and faculty that will inspire them to focus on the great opportunities it has for the future.

The new *Bioengineering* Department, which reports both to Engineering and Medicine, has been created. A chair and co-chair have been appointed, faculty searches are under way, and plans for admitting graduate students in 2004 are driving curriculum development and other teaching programs. As anticipated, student interest at both the undergraduate and graduate level is tremendous. Initially headquartered in the Clark Center, the department will complement Bio-X research activities as well as biomedical activities in several other engineering departments.

The new *Environment and Energy* initiative will build on current strengths among environmental engineering faculty and pockets of focused excellence in other departments. It will also provide a tremendous opportunity to leverage research and teaching across Stanford, including Earth Sciences, Natural Sciences, Social Sciences, Law and Business. GCEP will bring huge financial resources to energy research across campus; it will also bring a unifying and inspirational focus to efforts in mechanical engineering, chemical engineering, materials science, and management science. Faculty searches that focus on environment and/or energy are in progress and under discussion in several engineering departments.

Nanotechnology is a very broad and frequently overhyped term. At its core, however, there are wonderful opportunities for basic research. At Stanford, over one hundred faculty work on diverse topics that could be considered nanotechnology. The unifying prerequisite for this kind of research is access to sophisticated and expensive equipment that will allow faculty and students to build, characterize, and test nanostructures. It is clear from the success of the Center for Integrated Systems (CIS) that shared equipment facilities not only make economic sense, but also provide a way to build multi-disciplinary relationships and to create a community of scholars. The school has made great strides in enhancing the nanofabrication facility (CIS) and building a robust nanocharacterization facility (located in McCullough). The school intends to move forward with similar centers related to soft materials and computation, as well as enhancing the facilities at the Stanford Synchrotron Research Laboratory at SLAC.

These initiatives, along with new programs in photonics and computational mathematics, are creating a sense of excitement about the future of the school, both internally and externally. They are building the academic infrastructure for a future where the opportunities for engineering are clearly multi-disciplinary. The school is prepared to seize these opportunities.

HOOPER INSTITUTION

In 2003/04, the Hoover Institution will continue its program of public policy research, engage in active collecting of archival and unique library materials, distribute the research findings of the Hoover fellows, and disseminate information about the library and archives collections through an expanding outreach and communications program. The Institution's overarching purposes are: to collect the requisite sources of knowledge pertaining to economic, political, and social change and to understand their causes and consequences; to analyze the effects of government actions relating to public policy; to generate, publish, and disseminate ideas that encourage positive policy formation; and to convey to the public, the media, lawmakers, and others an understanding of important policy issues and to promote vigorous dialogue.

The Institution's research program continues its focus on initiatives that embrace the principles that define the Hoover Institution's mission: individual, economic, and political freedom; private enterprise; and representative, yet limited, government. From the academic disciplines of economics, history, law, and political science, Hoover fellows strive to conceive and disseminate ideas defining a free society in the form of institutional book projects, conferences, and forums. In addition, fellows pursue their individual research in U.S. politics, economics, and political economy and area studies of foreign policy and international security.

The goal of the research program is to produce analytical studies and other publications that convey important concepts to a broad audience, converting abstract academic scholarship to descriptive applications that minimize jargon known only to specialists in the field. Of the nine research initiatives, major emphasis will continue on American Public Education, which is completing the fifth year of a multi-year effort lead by Hoover's Koret Task Force on K-12 Education. The Property Rights, the Rule of Law, and Economic Performance initiative provides an overview of the importance of property rights to a free society. The

purpose of the initiative on American Individualism and Values is to embark on an intellectual inquiry into “the American way of life” and its appropriate “safeguards.” The National Security Forum represents the ongoing effort to involve Hoover fellows, other scholars, practitioners, and government officials to examine specific issues relating to international security. The principal goal is to produce writings that summarize a dialogue of experts for a general audience.

Research activity continues on the Institution’s five other initiatives—Accountability of Government to Society; Capital Formation, Tax Policy, and Economic Growth; End of Communism; International Rivalries and Global Cooperation; and Transition to Democratic Capitalism—but at a lower level of activity.

With the reorganization of the Hoover Library and Archives and the Stanford University Libraries, the Institution has returned to its original mission, as envisioned by Herbert Hoover: to gather archival and special collections; to preserve these rare documents on modern history; and to serve as a repository for rare and unique materials. While the collecting efforts focus on all aspects of political, economic, and social change, emphasis is being placed on three collecting priorities: the history of communism; transition to democracy and economic freedom; and cultural conflict, especially between the West and the Islamic movement.

An area of special importance is the expanded effort aimed at preserving the unique materials collected during the twentieth century to ensure they are not lost through damage, material deterioration, and normal wear and tear. To that effect physical preservation activities are increasing, as are vastly expanded digitalization projects that will make the collections safer and more readily accessible to users on-site and over the Internet.

Hoover fellows and other scholars actively use material found in the archives in support of their research and publications. A series of books based primarily on original documents found in Hoover’s Russian/Confederation of Independent States collection continues to be published in English and in Russian.

SCHOOL OF HUMANITIES & SCIENCES

In 2003/04, the School of Humanities & Sciences (H&S) will continue to build on the momentum of the strategic planning initiative that was launched in

connection with the university-wide needs assessment process. Central to all plans is the recruitment and retention of outstanding faculty who have world-leading stature as scholars and excellence as educators. Toward this end, the dean of the school and other academic staff will work closely with the departments to develop long-range hiring plans that will maintain the highest quality in the strongest departments with selective and limited growth. Modest investments will also be made to bring other departments to the next level in excellence.

In the humanities, growth will be focused within three general areas: literatures and cultures and the expression of imagination through language and text; history and civilizations encompassing the departments of History, Classics and Religious Studies; and philosophy and the structure of thought. Plans also are under way to establish a Film Studies program that will include new appointments in film history in the Department of Art and Art History, and related appointments in the literature departments where possible. The outstanding Documentary Film program in the Department of Communication will consolidate with these new faculty, and the school will add programs to allow students to study fictional film through writing and film-making. Facilities planning for the Departments of Art and Art History, Drama, and Music is also receiving a high priority.

Science facilities, both building and instrumentation, constitute the major need for the natural science cluster. A comprehensive regional plan will be put in place to make maximum use of existing facilities and to plan for new facilities for research and for innovative education. The excellence of H&S’ six top-ranked natural science departments will be sustained through modest growth in some new frontier areas and through recruiting both at the junior and senior level the top researchers in the world. In parallel, H&S will establish a Fellows program in Physical and Mathematical Sciences, which will bring the most outstanding young scholars in the world to campus.

In the social sciences, the most important need is renewal of the faculty in top departments and selective rebuilding and consolidation in other programs. The school will facilitate interactions among social science departments by allowing the relatively small faculty to benefit from connections. At the center of this strategy, the school will establish an Institute for the Social Sciences. This will provide a means to bring in

outstanding visitors to spend a year of work at Stanford and will function as an in-house sabbatical location for faculty much as does the Humanities Center. The school will also establish a quantitative center for social science research that will enhance one of Stanford's most important themes in social science research: the use of mathematical and quantitative modeling to understand fundamental patterns in social, political and economic life.

SCHOOL OF LAW

Over the last several years, the Law School has maintained excellence in its faculty and student body, enhanced the quality of its public intellectual life, and begun dramatic and long overdue renovations of its 25-year-old physical plant. Going forward, the Law School's key challenges are to keep replenishing its faculty, to enhance its newly expanded clinical education programs, and to continue to build a law school campus whose physical infrastructure facilitates academic interchange and collaborative study. Specifically, the Law School aims to:

- Rebuild its tenure-line faculty from less than 40 professors to its historic level of 45, emphasizing the hiring of junior faculty members and specialists in underrepresented fields such as international, constitutional, and regulatory law,
- Build its clinical faculty line from 2 to 5 professors whose specialty is training students to represent actual clients in live cases, emphasizing practical training and the development of professional responsibility, while continuing to support the new Stanford Community Law Clinic in East Palo Alto,
- Begin the renovation of the Law School Library so as to provide attractive and technologically modern study areas for students while housing collections in ways that make more efficient use of scarce space and that reclassify those collections for contemporary use,
- Build a residential complex for law students adjacent to the Law School to create an integrated community in which collaborative study, debate, and interchange flow seamlessly from classroom to dorm room, and
- Continue to build interdisciplinary research, teaching and policy programs in law, economics and business; law, science and technology; environmen-

tal and natural resource law; and international law, business and policy.

While focusing on these initiatives for future development, the Law School will need to continue providing on an annual basis support for existing programs that are essential to maintaining its competitive position in relation to peer schools, including:

- Summer research support to faculty members,
- Housing assistance to recruited faculty members on top of university programs,
- Instruction in legal research and writing (recently upgraded to satisfy ABA reaccreditation),
- Loan repayment assistance to graduates in low-paying public interest jobs, and
- Maintenance of strong levels of student service in the Law School's independently operated offices of admissions, financial aid, registrar, career services, and public interest programs.

SCHOOL OF MEDICINE

Since the latter half of 2001, the School of Medicine has worked hard to develop its strategic vision, initiatives, and plans for the first part of the 21st Century. To do so the school has focused on its core missions in education, research, patient care, and service to its communities, local and global. The school has formulated an action plan that is codified in a document entitled "Translating Discoveries" which has been shared widely among members of the Medical School community, as well as with leaders throughout the nation. While progress has been made in reaching many of the school's short-term objectives, the majority of the most important longer-term ones will take years to fully achieve. These include changes in education for medical and graduate students, new directions in research and enhancements of a number of clinical programs. These programs will require the efforts of many and ultimately involve new programs and facilities.

It is important to underscore that quite purposefully the school's strategic planning efforts have simultaneously engaged its multiple missions and support structures. The changes made in one mission area will surely impact others, making it essential to look at the interrelatedness of the threads that form the fabric of the academic medical center. Furthermore, aligning strategic plans and initiatives with the resources needed to achieve them —through administration

and finance, information technology, communications and philanthropy — and with the hospital partners is equally essential.

Several changes related to key flows of funds are underway in the School of Medicine and will be implemented in fiscal year 2003/04. The first of these is the school's formula with the university. During the last year, school and university staff have worked to define an appropriate and logical approach to calculating the amount that the school should contribute to the university to cover the cost of services provided to the school. The new approach takes the form of a "tax" on all sources of revenue and will increase the amount that the school contributes when compared with the previous formula. While this is an increase in cost to the school at a time when there are many calls on resources, Medicine is committed to covering its fair share of costs and believes that this is a reasonable and appropriate change.

The second change comes in the formula whereby the school of Medicine distributes funds to the academic units of the school. The current formula has been in place for almost two decades and no longer reflects the many facets of activities in the school. A committee of faculty and staff was convened in summer of 2002 to develop a new algorithm that specifically identified funding for educational activities and addressed more general needs for administrative and faculty support. The committee developed a series of principles upon which the new algorithm is based. The challenge faced in implementing the new algorithm is the reallocation of funding from some departments to others, creating needs for transition support as well as potential needs for some ongoing support. Despite the disruption of historical funding patterns, it is the belief of the school that the new algorithm appropriately recognizes its priorities and will be an effective formula over the longer term. The school is committed to working with all of the academic units to make certain that all are appropriately recognized and supported since the strength of the school is entirely dependent on the strength of the individual academic departments.

The third flow of funds that will change in the upcoming fiscal year is the funding that is provided by the hospital to the clinical departments. This flow of funds has been reduced in the last years as Stanford Hospital and Clinics has been addressing its financial crisis. While SHC has made significant strides in improving operations and financial performance, there are many

longer-term capital needs that SHC still needs to address. As a member of the Medical Center, the school is actively working with the hospitals to move onto a more stable financial base for both the short and long term. The new funds flow approach attempts to align the mission of the school with that of the hospitals and to support them in a manner that is consistent, fair, and transparent.

Fiscal year 2003/04 promises to be one of the most challenging budget years that the school has encountered in some time. The current economic climate has affected the return on endowment and expendable funds, as well as the success in generating substantial gift funding. Proposed funding of medical research by federal agencies is also much less than has been the case in the last five or more years. The changes in the formulas with the university and the hospitals have either increased the cost to the school or have limited the flow of funds to the school and the change in the school's distribution of funds to the departments will likely result in increased costs in the short term to facilitate the transition. The result of all of these changes is the need to choose very wisely which strategic initiatives can move forward.

VICE PROVOST AND DEAN OF RESEARCH

The Office of the Vice Provost and Dean of Research and Graduate Policy has responsibility for the development and oversight of research policy; oversight of the independent laboratories, centers, and institutes; policy development for Stanford's graduate education program; and management of the Offices of Technology Licensing (OTL), Environmental Health and Safety (EH&S), and Research Compliance.

The ten independent laboratories, centers, and institutes reporting to the Dean of Research encourage and support Stanford's interdisciplinary research and scholarship and currently account for about 20% of Stanford's research volume. These units provide strong programs that both complement and supplement Stanford's departmentally based research and scholarship, in addition to attracting excellent students and external scholars. The newest of these activities are the Stanford Center for Innovations in Learning (SCIL) and the Bio-X program for Bioengineering, Biomedicine, and Biosciences at Stanford, an emerging collaboration of faculty in the Schools of Engineering, Medicine, and H&S. The program will be housed in the new Clark Center for Biomedical Engineering and Sciences, which will open in the summer of 2003.

The Stanford Graduate Fellowship program, administered by the Dean of Research Office, now supports 359 outstanding graduate students in 34 fields in science, engineering, and the social sciences. Of the Stanford Graduate Fellows, 72 also earned nationally competitive fellowships such as National Science Foundation Fellowships and are honored as joint fellows.

VICE PROVOST FOR UNDERGRADUATE EDUCATION

In 2003/04 the Vice Provost for Undergraduate Education (VPUE) will sustain partnerships with faculty, departments, programs, and schools for the benefit of all undergraduates, fostering a university-wide community of teachers and mentors through a variety of approaches. VPUE programs focus on a continuum of intellectual skills that complement students' academic progress toward a degree. They articulate a dynamic path through the curriculum, engaging students in serious critical and scholarly inquiry in their first two years, leading to research partnerships with faculty. Budget reductions for 2003/04 were guided by the principle of minimizing the impact on student academic and intellectual life, while taking care not to erode important relationships with schools, departments, and student affairs offices. Innovations, though few in number, are substantive and important, affecting all undergraduates. Program growth in the VPUE is accomplished largely through reallocation, and emphasizes two areas—writing and undergraduate research.

The new Writing and Rhetoric Requirement (WRR) takes effect with the Class of 2007, entering in fall, 2003, and ends Advanced Placement exemption. It requires all students to complete two writing and rhetoric courses as well as the Writing in the Major (WIM) course for a total of three required courses; the first course, in the freshman year, emphasizes argument, research skills, and rhetorical strategies; the second, to be completed by the end of the sophomore year, emphasizes writing for oral presentation and communication; the third, the WIM course, focuses on disciplinary standards of excellence in writing in the major.

During the 2002/03 academic year, curricula and pedagogy for the new second-level WRR course were developed on a pilot basis by the Program in Writing and Rhetoric, which tested innovative approaches to instruction. The 2003/04 budget supports 30 of these new courses, and will utilize to full capacity two technology-enhanced classrooms in the newly

renovated Wallenberg Hall. These classrooms enable an interactive approach to workshop instruction, promoting active student involvement in their own learning. Additional facilities to support individualized coaching for students who are preparing oral presentations will also be equipped and staffed. The new speaking labs will adapt and expand the services of the successful peer Oral Communication Consultants program offered for almost a decade by the Speaking Center at the Center for Teaching and Learning.

Complementing innovations in writing courses, the services of the Stanford Writing Center will expand in 2003/04 to include juniors. Personal attention to students' writing is integral to the success of writing instruction, and the Center will augment the approximately 2500 individual consultations offered to freshmen and sophomores in 2002/03. These VPUE programs focus on the developmental progression of writing, research, and critical inquiry skills for all students.

Through the Undergraduate Research Programs (URP) office, the VPUE funded 32 Departmental Grants and almost 80 Faculty Grants in 2002/03 to support over 500 students assisting faculty in their research; more than 450 additional students received independent research grants, for a total of almost 1,000 undergraduates supported by URP funding. As research assistants, students accompany faculty to the far corners of the world, from Peru to Antarctica, from Norway to Sicily. They work closely, often daily, with their faculty mentors and graduate research groups in fields as diverse as geophysics and archeology in places as varied as laboratories, libraries, music studios, and archives. For students whose research projects are located on campus over the summer, the Summer Research College has expanded its residential capacity to almost 300 spaces with special social and educational programming to round out the experience of a scholarly community.

The amount of support requested in the departmental and faculty proposals to support undergraduate research exceeds the amount available, despite the allocation of additional funds to this purpose. This trend confirms the growing popularity of involving undergraduates in research at earlier stages in their careers. The 2003/04 budget continues to increase support for undergraduate research grants in response to the unmet demand and in anticipation of more independent projects as greater numbers of underclassmen start earlier to acquire the research experience preparatory

for creative independent scholarship. The vitality of Stanford's research faculty is reflected in the URP grant programs and is matched by faculty enthusiasm for the contributions undergraduates make to the discovery of knowledge.

The URP office also sponsors the innovative Symposium on Undergraduate Research in Progress (SURP) where over one hundred students present posters and more than twenty students give talks on their research projects. Held for the first time during Reunion Week-end 2002, this lively event was an opportunity for undergraduates to engage in conversations with alumni and fellow students about their work while it is still evolving. SURP illustrates different developmental stages in the process of research, from exploration of a topic to designing a research question and hypothesis, through collecting and evaluating evidence. Honors Symposia held in spring quarter traditionally provide opportunities to showcase the end products of students' research; SURP's focus on the process of research adds an important educational dimension to the experience. SURP is scheduled to continue in 2003/04.

The VPUE sustains a special focus on engaging students in serious critical and scholarly inquiry in their first two years as a foundation for future achievement. Stanford Introductory Seminars are the cornerstone of this endeavor, providing opportunities for over 240 faculty members to reach over 2500 students in areas of common intellectual interest. By the end of the sophomore year, 75% of all students have taken at least one Introductory Seminar. The 2003/04 budget serves freshmen and sophomores at the same levels of participation as in 2002/03 while reducing some allocations for course development and increasing class size modestly in sophomore seminars, from 12 to 14.

General Education is another special focus for the VPUE in the students' first two years. The Introduction to the Humanities (IHUM) program benefits from VPUE's investment in academic technology that expands the availability of humanities "texts" to include materials in visual, musical and dramatic arts. With access to technologically equipped classrooms, discussion sections can analyze and compare multiple stagings of the same Shakespeare scene, for example, thus enriching the depth of critical inquiry into the written text. Online discussions between class meetings allow students and instructors to keep issues moving forward, and give those students who need more time to formu-

late their responses the chance to engage more fully with others. Budget reductions in IHUM are constrained by Senate-mandated requirements, and center on curriculum development support, reflecting the reduced need for new courses after five years of successful program operation.

Across the VPUE, recent efforts to build a solid administrative infrastructure have resulted in closer collaboration and more effective interrelationships among VPUE units. A rational organization and logical allocation of space in Sweet Hall have enabled the VPUE to provide better service to faculty and students throughout the university. The improvements in communication and management helped contribute to developing a budget reduction plan based on careful assessment of program quality and centrality to the mission of undergraduate education.

STANFORD UNIVERSITY LIBRARIES AND ACADEMIC INFORMATION RESOURCES (SUL/AIR)

SUL/AIR's Socrates catalog, the comprehensive, campus-wide on-line catalog of Stanford's holdings, has a new design that provides more flexibility to readers seeking information, at less cost to the university. The Serials department has implemented a much-improved on-line tool that provides information about and access to the numerous electronic journals to which Stanford libraries subscribe. A new guide for students in the Program in Writing and Rhetoric (PWR) has been designed and built by the Information Center staff in concert with the PWR staff; it will be widely deployed in 2003/04. The Digital Library Program has much-greater and improved capacity to digitize printed materials for use in teaching and research.

Thanks to two major grants, one from the National Science Foundation and the other from the Andrew W. Mellon Foundation, major progress is underway in the LOCKSS program, which is building, testing, and promulgating a network caching application for local, digital preservation operations at libraries around the Earth. Further developments and refinements of CourseWork will be underway. SUL/AIR staff will carry forward important work on the Stanford Digital Repository, the Stanford Scholarly Communications Service, and mass digitization of various information resources. SUL/AIR's web presence will be renovated in 2003/04 to increase the functions and information provided to readers as well as to make updating its contents easier for staff.

In early 2003/04, Stanford Auxiliary Library III will open in Livermore, about 50 miles from campus. Substantial funding from SUL/AIR's reserve, on the order of \$1 million per year for the next two years, will be necessary to activate the building and move targeted collections now in leased storage and on-campus stashes. The Hoover realignment effort continues to identify and transfer books and serials from the Hoover Library facility to SUL/AIR's stacks.

STANFORD LINEAR ACCELERATOR CENTER

As a National User Facility of the Department of Energy (DOE), SLAC continues to provide world-class experimental facilities to about 3,000 scientists from all over the world in the two main research programs, high energy physics (HEP) and x-ray science. The ultra-high intensity x-ray beams at the Stanford Synchrotron Radiation Laboratory (SSRL) serve many areas of science such as materials sciences, structural biology and analytical chemistry. The powerful synergy of the two SLAC research programs has led to development of unique capabilities for scientific exploitation. One example is the Sub-Picosecond Pulse Source (SPPS) described below.

High Energy Physics

The PEP-II/BaBar B Factory remains the primary focus of the HEP experimental program. The BaBar collaboration (600 physicists from 10 countries) continues to produce physics of exceptional quality at a prodigious rate. In April 2003, the collaboration announced the discovery of a new subatomic particle, named $D_s(2317)$. A nine-month operation of PEP-II/BaBar is planned in 2003/04 and an accelerator upgrade program is under way to double the luminosity in 2004. Upgrades to the BaBar detector are also in progress in order to keep up with the increasing luminosity.

SLAC continues to lead an extensive R&D effort aimed at the eventual construction of a high-energy, high luminosity, electron-positron linear collider for unique experimental investigations at the TeV energy scale. The Next Linear Collider (NLC) R&D program at SLAC is being carried out in close collaboration with Japan's National Laboratory for High Energy Physics, and other DOE National Laboratories (FNAL, LBNL, and LLNL). The key activity in the next year will be a feasibility demonstration of the technology for the radiofrequency power system.

In the particle astrophysics arena, fabrication of the Large Area Telescope (LAT), the primary instrument

of the Gamma-Ray Large Area Space Telescope (GLAST) mission, is in progress. DOE and NASA jointly fund the U.S. involvement in the international LAT collaboration led by the Stanford team (SLAC, Physics Department and HEPL). The LAT fabrication schedule is targeted to meet the launch planned in 2006. The new Kavli Institute of Particle Physics and Cosmology is expected to bring new opportunities for SLAC.

The fixed-target program at End Station A (ESA) employs SLAC's unique capability of a high-energy polarized beam. The Moller scattering experiment, which measures the electroweak mixing angle with high precision, will have its final run in summer 2003. As a result of extreme tightness of the budget, the next series of approved fixed target experiments has been cancelled.

X-ray Science at SSRL

SSRL is going through a period of significant transition. The second generation synchrotron light source SPEAR2 ended its operation in March and is being upgraded to a third generation machine. Commissioning of the new SPEAR3 facility will begin in November and operation for users is expected to resume in early 2004. DOE and NIH jointly funded the SPEAR3 project.

A new x-ray beam line utilizing the Sub-Picosecond Pulse Source (SPPS) is being commissioned. In 2004, it will offer the first opportunity in the world to conduct scientific experiments with high brightness, ultra short pulse x-rays. Also, it will be invaluable for the R&D of novel x-ray optics and development of techniques for exploiting coherent x-rays in preparation for the Linac Coherent Light Source (LCLS). An international consortium funded the x-ray facility together with DOE.

Plans are underway for the construction of the world's first x-ray free-electron laser, LCLS, which will utilize the last third of the linear accelerator and the technologies developed at SLAC for linear colliders. The design phase for the facility has been initiated in 2003. The estimated cost of the facility is about \$220 million and the current plan is to begin the three-year construction in 2006. SLAC will lead the collaborative effort on the design and construction of LCLS with two other DOE national laboratories (ANL and LLNL). The LCLS will deliver intense femtosecond coherent x-ray beams, which will open new realms of scientific application in the chemical, material and biological sciences.