

RESEARCH / CREATIVE WORKS TASK FORCE
University of Colorado at Boulder

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Executive Summary

The state of research/creative work at CU/Boulder has been found by the Research/Creative Works Task Force (“RTF”) to be fragile: While there are some very obvious and laudable strengths in terms of federal support, the funding from state, local, corporate, and private sources lags far behind comparable institutions. Many internal university issues such as research infrastructure, faculty salaries, and integration of research and teaching require substantial improvement. Thus, prompt and enduring attention must be paid by all components of the Boulder campus community in order to assure continued health and vigor for the research enterprise.

External Funding and Relations

The success of CU/Boulder in obtaining federal support is a testimony to the ingenuity, diligence, and hard work of our faculty and our professional research staff. In all that we do, we must first assure that we do no harm to the present success in the federal arena. The level of state funding lags far behind that of our peer institutions and is not likely to increase.

Recommendations:

Federal Funding

1. CU/Boulder success in obtaining Federal Funding is based primarily on our successful researchers. We must assure that we retain and reward these successful individuals. Salaries and benefits for top faculty and research staff must be fully competitive with the best public universities or we risk losing these personnel and, with them, our federal funding base.
2. The Boulder campus should increase the funds allocated to the Chief Research Officer for matching in funding proposals. The RTF finds that these matching provisions increase substantially the proposal success rate in the federal arena.
3. Other institutions have effectively obtained federal funds through “earmarking”. It is imperative that CU/Boulder work with our congressional delegation and others to obtain new funds for buildings, major facilities, and other program enhancements.

State Funding and Relationships

1. CU/Boulder has a large number of existing department, college and graduate school advisory boards which should become effective advocates for the needs of the university in approaching the state government.
2. The Boulder campus must develop a mechanism for state matching of major educational and research proposals and needs to replace the support previously provided by state agencies.
3. The Boulder campus should use the outreach activities of the campus such as the developing ATLAS program, community/school partnering in the School of Education, and the Discovery Learning Initiative and Center to demonstrate the interconnection of research and learning for all our students and faculty.

Corporate Advice and Relationships

1. The University must identify and recruit corporate executives to communicate to the state legislature and the executive branch the importance and critical role of the University of Colorado (and state funding to the University of Colorado) in the current and future state of industrial development and growth throughout Colorado.
2. The campus must improve corporate sponsorship and relationships by elevation of support and services to (and from) the Technology Transfer Office.
3. It is necessary to develop an intimate rapport between the University of Colorado and multinational corporations with operations in the state to foster long-standing and broad industrial support for the campus community.

Private Donations

1. The success of the CU Foundation in soliciting private and corporate donations is greatly enhanced with the involvement of faculty. Communications must be improved between campus faculty and the CU Foundation in order to increase the number and size of donations.
2. Peer institutions have a much higher number of endowed chairs than CU/Boulder. A continued area of focus for the Foundation should be soliciting funding for endowed chairs across campus departments, programs, and disciplines.
3. The Foundation should undergo a thorough, independent Program Review by outside reviewers. The recommended review should study the advisability of a radical restructuring of the Foundation, evaluation of the size of the Foundation staff available and whether salary levels are appropriate and competitive.
4. Contributions from alumni are extremely low at CU. The first step in increasing contributions from alumni is to update alumni lists and make them readily available for fundraising efforts by the Foundation, departments, and colleges.

Internal and Infrastructure

CU-Boulder should continue to do those things at which it has excelled in the recent past. It should continue its exemplary record of successful federal grant writing. The CU/Boulder campus should preserve the general high quality of the natural sciences (in this report, the term "natural sciences" includes engineering). It should raise the status of and support for research and creative work in the humanities, arts, and social sciences. Over the next decade, CU-Boulder should have departments and institutes in the humanities, arts and social sciences that are as highly regarded in their respective disciplines as are the foremost units in the natural sciences. **One of the most important messages that the RTF can deliver is that the CU/Boulder campus is more dependent on the health and well being of research than any other comparable public university. Over 37% of the funding for the campus comes from research dollars.**

Recommendations:

Internal University Issues

1. In order to provide funding for many of the RTF recommendations, the additional 2 percent ICR negotiated with the federal government should be reinvested directly into support for research.

2. Substantial start-up funds are now required to successfully recruit new faculty. Currently, many units are being asked to come up with 50% or more of faculty start-up funds. CU Boulder start-up packages have been shown to be 1/5 to 1/3 that of competing institutions. We recommend that the campus implement support to at least double the present level available for start-up packages.
3. Intense effort should be made to augment internal grants and other forms of support for faculty research. This should include increasing support for sabbatical leaves and for such internal granting institutions as the Council on Research and Creative Work, the Graduate Committee on Arts and Humanities and similar bodies.
4. The campus needs to increase explicit support for the graduate school to better support research.
5. Library acquisitions and other facility improvements must be made immediately to make the CU-Boulder libraries competitive with those of the top fifteen public research universities.

Infrastructure and Administrative Support

1. There must be a strong voice for research at the decision-making table by enhancing the role of the Chief Research Officer on the campus. Making the CRO a permanent member of Chancellor's cabinet can do this. The university administration should also explore elevating the status of the CRO to the level of a vice-chancellor.
2. Facilitate relationships between the research institutes and academic departments in ways which encourage the integration of teaching and research of all faculty.
3. Augment the status of Research Associates. Many Research Associates are responsible for a significant number of the grants received by institutes and they deserve to have their role in obtaining such grants properly recognized.
4. Make it easier for faculty to manage their allocation of courses. This includes provisions for distributing their courses during the Maymester, summer sessions or any other times at which course may be offered.
5. Given the recent restrictions on the use of federal grant dollars for administrative and clerical support, some mechanism needs to be put into place to cover such costs from the University because there is no source of funds for these expenses.

Introduction

In September 1999, Vice-Chancellor Phil DiStefano established the Research/Creative Works Task Force for the Boulder Campus of the University of Colorado. The primary charge to the Task Force (hereafter abbreviated RTF) was to assess what presently works well in the research/creative work arena at CU/Boulder, and what does not. The request was to determine the strengths and weaknesses, as well as the opportunities and barriers, for research broadly defined. The RTF was asked to help determine where the Boulder campus could (and should) be in the next five to ten years with respect to research, and in the course of this evaluation to identify appropriate new sponsored research opportunities. This report is the product of the RTF's study of these issues during the course of the Fall Semester of 1999.

State of Colorado statutes mandate that the Boulder campus of the University of Colorado is to be a "comprehensive graduate research university with high admissions standards which offer a comprehensive array of undergraduate programs". Over the past several decades the Boulder campus has taken very seriously the charge to be at the forefront of research, and to insure that this research is accomplished through the highest quality graduate and undergraduate teaching. In 1994, for example, the task force on the Pursuit of Excellence characterized the campus as "a diverse community of advanced learning with the highest standards of scholarship, in which research and creative work enlighten and enrich the teaching of students who thrive in an academic environment."¹

During the past several decades, the CU-Boulder faculty have fulfilled this mandate in an exemplary manner. For example, since 1977 the dollar amount of sponsored project awards has increased by almost 1,000%. CU-Boulder faculty members have received numerous important international awards. Although this record of growth and productivity has been outstanding, the Research and Creative Work Task Force concludes that it rests on a fragile basis. Simply put, CU-Boulder accomplishes more in the areas of research and creative work with fewer resources than do any other large public research universities. There is no guarantee that CU-Boulder will be able to continue to excel in gaining sponsors for its research projects and producing first class scholarly works. In order to continue on the path to being among the very top public research universities in the country, the RTF recommends substantial enhancements of the campus support for the research and creative work activities of the faculty.

Present Research Funding

The status of present research funding can best be assessed in terms of recent historical trends. Plots of federal dollars in grants and contracts show that research funding has doubled in the period between 1991 and 1999 reaching \$204M in 1999, a remarkable record. At the same time, achieving economies of scale, CU/Boulder uses only 0.4% of the research dollars to operate the office of Contracts and Grants (down from 0.55% in 1991). An analysis of information provided

¹ Pursuit of Excellence Task Force, University of Colorado, Boulder, *Enhancing Excellence for the Twenty-first Century* (May 16, 1999), p. 17.

by the NSF shows that CU is 4th in the nation in the number of research funding dollars per faculty member, only surpassed by the University of California, Berkeley, the University of Wisconsin, and the University of California, Los Angeles. From the same analysis, the Boulder campus is on a par with the University of Michigan, Ann Arbor. This is a quite remarkable achievement given the fact that CU/Boulder is at the bottom in Non-Federal Funding Income (of which state and local industry support are components) among the top thirteen public universities in overall research revenues.

Given these observed facts, steps must be taken to insure that the progress that has been made is maintained. Moreover, we must improve in those areas of funding where we are lagging behind. The findings and recommendations made here are divided into two major categories: (1) External Funding and Relations; and (2) Internal and Infrastructure Issues. The CU/Boulder administration is strongly urged to act promptly and positively on both external and internal issues pertaining to the research enterprise.

External Funding and Relations

Federal Funding

As noted above, federal funding for research is one of the sterling successes at CU/Boulder. This is a testimony to the ingenuity, diligence, and hard work of our faculty and our professional research staff on this campus. In all that we do, we must first assure that we do no harm to the present success in the federal arena. Quite the contrary, it is most important that CU/Boulder provide all the support and tools necessary to allow individuals and groups to be even more successful in the federal competition for funds.

In order for CU/Boulder to maintain (and improve) its present success in federal funding, the RTF makes the following recommendations:

1. We must assure that we retain and reward our most successful researchers. This means that salaries and benefits for top faculty and research staff must be fully competitive with the best public universities.
2. CU/Boulder should increase the funds allocated to the Chief Research Officer for matching in funding proposals. The RTF finds that these matching provisions increase the proposal success rate.
3. The only “breakout” strategy that the RTF could identify in the federal funding arena was a more aggressive use of “earmarking” of federal funds. Thus, it is imperative that CU/Boulder work with our congressional delegation and others to obtain new funds for buildings, major facilities, and other program enhancements.

State Funding and Relationships

State funding for the CU/Boulder campus makes up only about 11% of the overall operating budget of the university. This is a very small fraction compared to the U. of California, Berkeley, the U. of Virginia, and many of the other major public universities with which we are to be compared. It is the assessment of the RTF that CU/Boulder probably is not going to be able to increase dramatically the amount of state funding provided for research. However, it is crucially important to improve the perception of the importance and value of research by state officials and state agencies.

Thus, we urge that efforts be made as soon as possible to employ new strategies with both the legislative and the executive branches of the Colorado government to give the Boulder campus the freedom to employ innovative and entrepreneurial approaches in the research enterprises.

The following specific further recommendations are made:

1. Existing department, college and graduate school advisory boards should be educated to become effective advocates for the needs of the university. The preparation of white papers on research and learning, educational effectiveness, and outreach and partnerships would provide background information to the boards in support of specific recommendations for state support.
2. A state mechanism for matching of major educational and research proposals needs to be developed to replace the support previously provided by CATI or other state agencies.
3. The Boulder campus should use the outreach activities of the campus such as the developing ATLAS program, community/school partnering in the School of Education, and the Discovery Learning Initiative and Center to demonstrate the interconnection of research and learning for all our students and faculty.

Corporate Advice and Relationships

We note the economic strength of the state of Colorado, which is highly correlated with the development and growth of corporations, especially high-technology industries. The University of Colorado can and does provide a strong foundation for these industries by preparing a well-educated work force, providing access to state-of-the-art research facilities and collaborators, and fueling technological advances that have led to the emergence of numerous small venture capital-based companies throughout the state. Despite these positive aspects of existing corporate-university relationships, the University of Colorado lags significantly behind its peer institutions in industrial funding levels, and relationships must be further nurtured to strengthen the overall, and highly integrated, research and educational programs at CU. Specifically, we recommend the following action items:

1. We must identify and recruit corporate executives to communicate to the state legislature and the executive branch the importance and critical role of the University of Colorado (and state funding to the University of Colorado) in the current and future state of industrial development and growth throughout Colorado.
2. It is necessary to improve corporate sponsorship and relationships by elevation of support and service to (and from) the Technology Transfer Office to assist and advise on intellectual property matters, to solicit and review invention disclosures, and to foster contacts and contracts between local and national companies and the University of Colorado.
3. We must develop an intimate rapport between the University of Colorado and multinational corporations with operations in the state to foster long-standing and broad industrial support for the campus community.

Private Donations

We note with satisfaction that, especially since the start of the TLE Campaign in AY 96/97, the CU Foundation has made strong progress in annual giving. However, this progress is counterbalanced by two factors: (1) the very low levels of annual giving registered before the TLE Campaign; and (2) the fact that general patterns of private donations independent of the campaign remain more or less unchanged. (When TLE commitments are removed, and allowing for the unusually high level of giving achieved during Charles Middleton's last year as Dean of A&S in AY 95/96, the level of independent donations stands at pre-TLE levels.) What is more, as the Foundation acknowledges, private donations to CU are dramatically lower than those enjoyed by peer institutions, in particular at the two universities that both the Chancellor and the Foundation cite as models, the University of Michigan and the University of Virginia.

Communications between some members of the Foundation and campus faculty are very poor, and our colleagues report an almost uniformly unhappy experience in their dealings with the Foundation and with Foundation staff. This is related to the following more general features of Foundation conduct and structure:

The Foundation exists as an autonomous entity that stands apart from both the CU system as a whole and the campus in particular. The Foundation's agenda commonly appears to have been formulated with little faculty input or control, and there is also an impression of remoteness and secretiveness.

A both surprising and troubling finding was that there is very little information available concerning the CU Alumni Association. We do not know how it operates, to whom it answers, or what it does. It is also far from clear how it relates to or collaborates with the Foundation. Our sense is that the Association needs to communicate with the campus it serves and play a role in enhancing communication between faculty and potential alumni donors.

All campus departments and programs should publish regular newsletters for distribution to their alumni (accurate updated lists of whom should be available from the Foundation). These

newsletters should moreover be as glossy as possible on the principle that money always follows money. Further, in order both to ensure that departments and programs have the resources required to produce proper newsletters and to guide faculty in pitching their alumni in a productive way, it would be best if all newsletters passed through a central clearinghouse in the campus Foundation office. (As an example of what the faculty needs to learn about newsletters, we cite the practice of informing alumni readers of specific funding needs and of the concrete results such funding would achieve.)

We further note that what we feel toward the Foundation mirrors in some respects what Foundation staff assigned to the campus and its schools and colleges feel about their own central administration. Staff assigned to the campus have expressed frustration and divided loyalties owing to the Foundation's institutional independence of the campus they try to serve. At least at the campus level, the Foundation is understaffed and many of its personnel are dramatically underpaid.

The above observations and findings lead to the following recommendations:

1. Communications between campus faculty and the Foundation must be improved. The Foundation should do a better job of informing faculty of its programs and priorities. It should also involve faculty more often and more directly in fundraising, and faculty priorities should be more fully reflected in Foundation goals.
2. Of particular importance is the creation of endowed chairs across campus departments, programs, and disciplines. This is an area in which the Foundation could contribute directly to alleviating a major campus problem, namely, by addressing poor salaries relative to peer institutions and consequent difficulty in retaining our best scholars, artists, and teachers.
3. The Foundation should undergo a thorough ongoing Program Review by outside reviewers from peer institutions with a proven track record in private fundraising. This review should be independent of system, campus, or Foundation control in order to ensure that all concerned will perceive it as genuinely impartial. The review would focus on all aspects of Foundation structure, operations, personnel, policy, and performance. A major focus of the recommended review would be the advisability of a radical restructuring of the Foundation. At the campus level, such a restructuring would follow the models of the University of Michigan and the University of Virginia in making fundraising staff employees of the University itself. It would also devolve more authority to the campus level, enabling campus staff to focus on and communicate more intensively with their immediate faculty partners. The review should also evaluate whether the size of the campus Foundation staff should be increased. Salaries should rise to levels comparable to those offered by peer institutions, and in particular the University of Michigan and the University of Virginia.
4. The Foundation must update alumni lists, ensuring that they are both as accurate and as complete as possible, and make them readily available not only to its own campus staff, but to departments and programs.

Internal Funding and Infrastructure Issues

CU-Boulder should continue to do those things at which it has excelled in the recent past. It should continue its exemplary record of successful federal grant writing. It should preserve the general high quality of the natural sciences and engineering. It should raise the status of and support for research and creative work in the humanities, arts, and social sciences. Over the next decade, CU-Boulder should have departments and institutes in the humanities, arts and social sciences that are as highly regarded in their respective disciplines as are the foremost units in the natural sciences and engineering.

Internal University Issues

Many relatively small steps, all within the grasp and control of the Chancellor and the Vice Chancellor, could be taken almost immediately. These steps would send a very positive message and would – in the judgement of the RTF – have a dramatic effect on improving morale on the campus. Such things as improving the use and distribution of DAICR, for example, and encouraging better communication (as between OCG and the Vice Chancellor for Administration) could have profound benefits.

The RTF recommends that the following internal steps be taken:

1. Reinvest the additional 2 percent ICR negotiated with the federal government directly into support for research. Make available for campus research and creative work the additional interest savings (currently estimated at \$200K per year) the campus no longer will pay on contracts and grants between the date on which expenses are incurred and the date on which the granting agency pays the expenses.
2. Currently, many units are being asked to come up with 50% or more of faculty start-up funds. This is rapidly becoming the most significant stumbling block in successful recruitments. We recommend that the campus implement support of start-ups to at least double the present level available for start-up packages. RTF has arrived at the conclusion that in the natural sciences start-up packages are presently as high as \$600K and are increasing due to the high competition for excellent faculty. A survey of recent recruitments has shown that in many cases the size of the CU Boulder start-up was 1/3 to 1/5 that of competing institutions.
3. Augment internal grants and other forms of support for faculty research. This should include increasing support for sabbaticals from the current level of 100% for one semester or 50% for two semesters to 100% for one semester or 60% for two semesters. Increase support for such internal granting institutions as the Council on Research and Creative Work, the Graduate Committee on Arts and Humanities and similar bodies. These agencies should move to increase support for faculty fellowships, travel grants and distinguished research lectureships.
4. Increase explicit support for the graduate school to better support research.
5. Increase library acquisitions to make the CU-Boulder libraries competitive with those of the top fifteen public research universities. Library resources are important to undertaking research in nearly every discipline; they are vital for research and creative work in the humanities, arts and social sciences. Libraries form a critical part of the University's research

infrastructure, as important as start-up packages, laboratory facilities, or OCG. Indeed, especially in the Humanities and Social Sciences, libraries play a role exactly comparable to that of the research lab in the Natural Sciences. Without proper libraries, humanists and social scientists lack the basic data needed for their work. UCB's performance in this regard is weak. Only 2 of the 8 peer institutions for which figures are available (the University of Missouri-Columbia and the University of Pittsburgh) devote less money to libraries. Three (Indiana University, the Ohio State University, and the University of Virginia) outspend UCB by around 20-25% while 2 others (the University of Kansas and the University of Illinois) outspend UCB by \$9.4 million and \$10.9 million respectively. (The differences in these 2 cases equals 57% and 66% of UCB's \$16.6 million library budget.) A 25 to 50% increase in the campus library budget is thus a reasonable as well as a crucial step in enhancing our status as a major research university.

Infrastructure and Administrative Support

Perhaps one of the most important messages that the RTF can deliver is that the CU/Boulder campus is more dependent on the health and well being of research than any other comparable public university. Over 37% of the funding for the campus comes from research dollars. There must be a strong voice for research at the decision-making table.

To achieve the overall research goals, the RTF makes the following recommendations regarding the campus infrastructure and administrative support for research and creative work:

- 1. Enhance the role of the Chief Research Officer on the campus. Making the CRO a permanent member of Chancellor's cabinet can do this. The university administration should also explore elevating the status of the CRO to the level of a vice-chancellor, as is the case in our peer institutions.**
2. Facilitate relationships between the research institutes and academic departments in ways which encourage the integration of teaching and research of all faculty. Make resources of the institutes available to more faculty members whose scholarly activities will benefit from these affiliations.
3. Augment the status of Research Associates. Many Research Associates are responsible for a significant amount of the grants received by institutes. These Research Associates deserve to have their role in obtaining such grants properly recognized.
4. Make it easier for faculty to manage their allocation of courses. This includes provisions for distributing their courses during the Maymester, summer sessions or any other times at which course may be offered. It also includes provisions for faculty not on grants to buy-out courses.
5. Given the recent restrictions on the use of federal grant dollars for administrative and clerical support, some mechanism needs to be put into place to cover such costs from the University because there is no source of funds for these expenses.

Listing of Appendices

Appendix A

- A-1 Charge to Task Force
- A-2 Methodology
- A-3 Comparisons with Peer Institutions

Appendix B

- B-1 Faculty Input to Task Force
- B-2 Notes from Task Force meeting with Chief Research Officer (C. Lynch)
- B-3 Notes from Task Force meeting with Director of OCG (L. Nelson)
- B-4 Notes from Task Force meeting with V.C. for Budget and Finance (R. Porreca)
- B-5 Notes from Task Force meeting with C.U. Foundation (L. Bachrach, P. Bauman)

Appendix C

- C-1 Research Questionnaire Sent to Peer Institutions
- C-2 Summary of Questionnaire Responses
- C-3 Observed Trends and Analyses

Appendix A-1

Charge to Task Force Primary Charge to the Committee

Strategic Questions:

Where does the Boulder campus want to be in its research efforts and the integration of research with education and service in the next five to ten years? What works well now and what does not (strengths, weaknesses, opportunities, barriers)?

Tactical Questions:

1. How can the campus better support investigators as individuals and as collaborative groups?
2. How can researchers collaborate effectively between disciplines, campuses, and universities?
3. How can technology be utilized to support research efforts?
4. Are there potential or existing areas of sponsored research opportunities given our strength, needs, and funding possibilities?

Task Force Activities:

- Consider the research infrastructure, finances, and managerial operations.
- Make comparisons with other institutions with similar research levels (campuses without health sciences) to look for models and best practices.
- Interview peer institutions on topics including:
 - ⇒ Space allocation and management
 - ⇒ Technology transfer
 - ⇒ Staffing levels in support units
 - ⇒ Organizational structure

With this information, the task force should be able to answer additional questions such as: Relative to other institutions with similar research characteristics, how do our staffing levels compare in the offices for sponsored program support and technology transfer? How will projected growth in research over the next five years affect these offices? How can the campus determine whether current space allocated to sponsored research is being effectively managed and efficiently used? How will growth in research affect the way the campus allocates and manages space? What will be the new demands for research facilities, and given that the State will not fund research-related projects, how should these projects be funded?

Other Activities

- Task Force on Graduate Education
- Task Force on Faculty Recruitment

Appendix A-2

Methodology

- Met with Vice Chancellor DiStefano to clarify charge and scope of activities
- Added new members to improve balance and range of Task Force membership. Added “Creative Works” to Task Force name.
- Met approximately weekly during Fall Semester, 1999.
- Sent preliminary findings, directions, and questions (Appendix B1) to faculty and units.
- Met with principal elements of the campus research infrastructure (see Appendix B summaries)
- Sent out questionnaires to over 30 comparable public universities (see Appendix C).
- Members met with A&S chairs and various other groups (Institute Directors, unit chairs, etc.) to get feedback and advice.
- Gave mid-term briefing to Drs. Byyny and DiStefano (November 1999).
- Final briefing on report (February 2000).

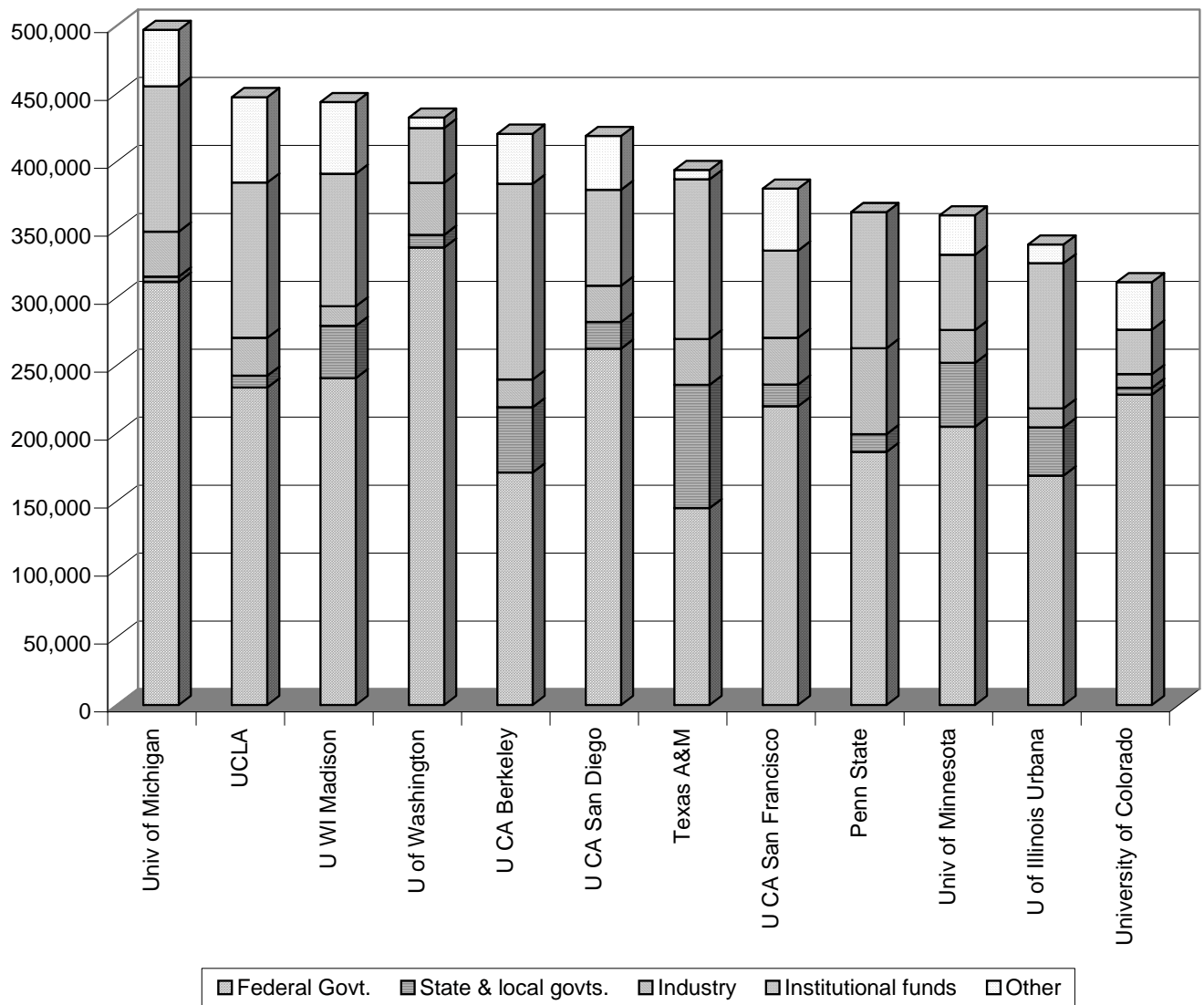


Figure A3.1 Total research expenditures by source of funding for top 12 public research universities in thousands of dollars.

Source: National Science Foundation /SRS, Survey of Research and Development Expenditures at Universities and Colleges, Fiscal Year 1998

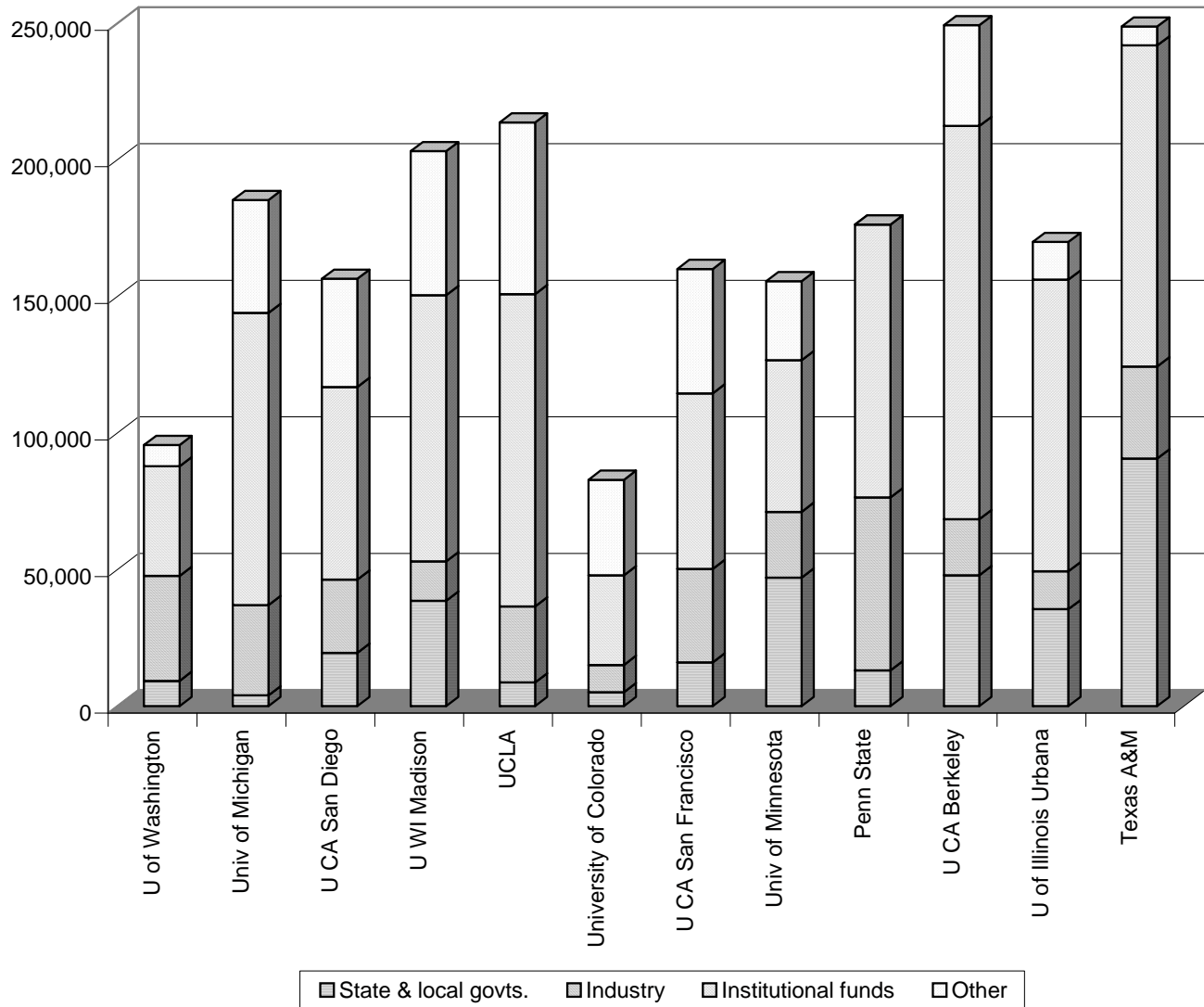


Figure A3.2. Research expenditures by top 12 public universities after removal of federal income. In decreasing order of federal income. Dollars in thousands. This shows the very weak state, corporate, and institutional funding of CU/Boulder compared to all other institutions.

Source: National Science Foundation /SRS, Survey of Research and Development Expenditures at Universities and Colleges, Fiscal Year 1998

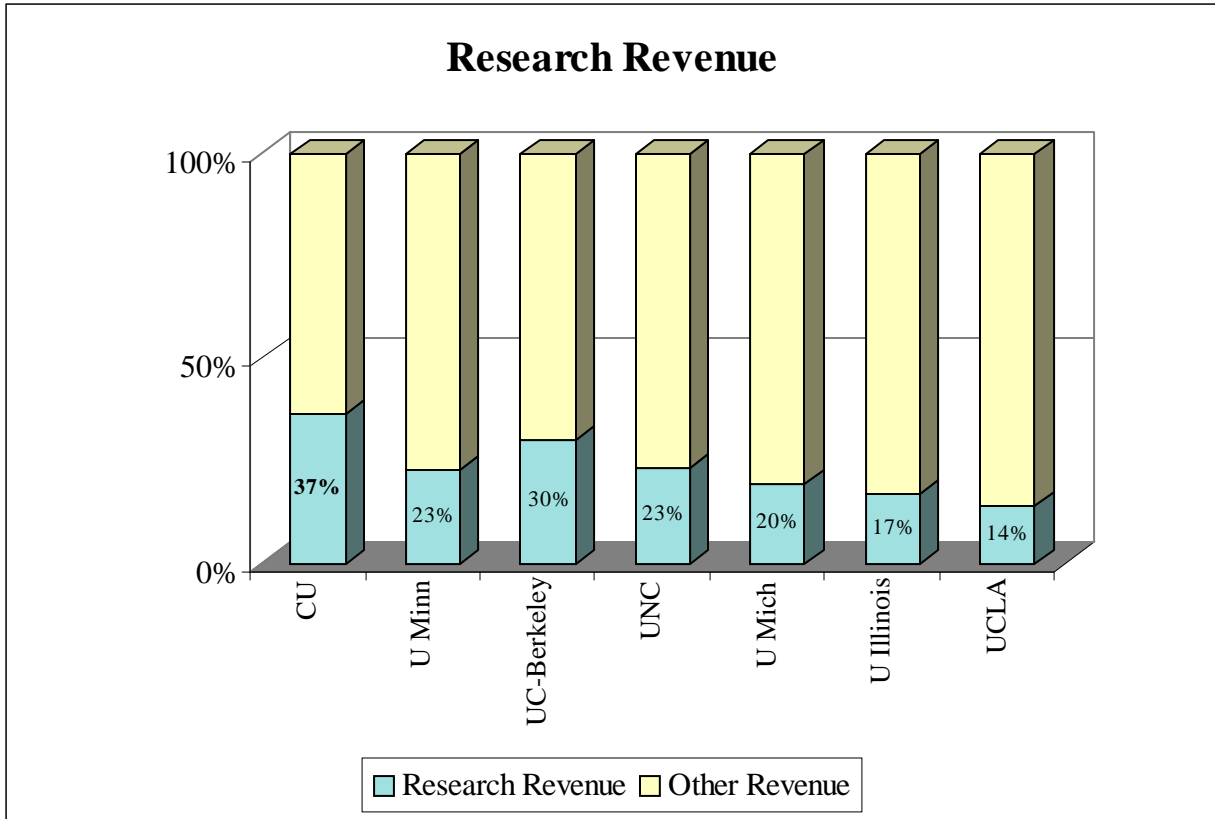


Figure A3.3. Research revenue as a fraction of total operating budgets of the most prestigious public universities. CU/Boulder relies much more heavily on research dollars than any other major public university.

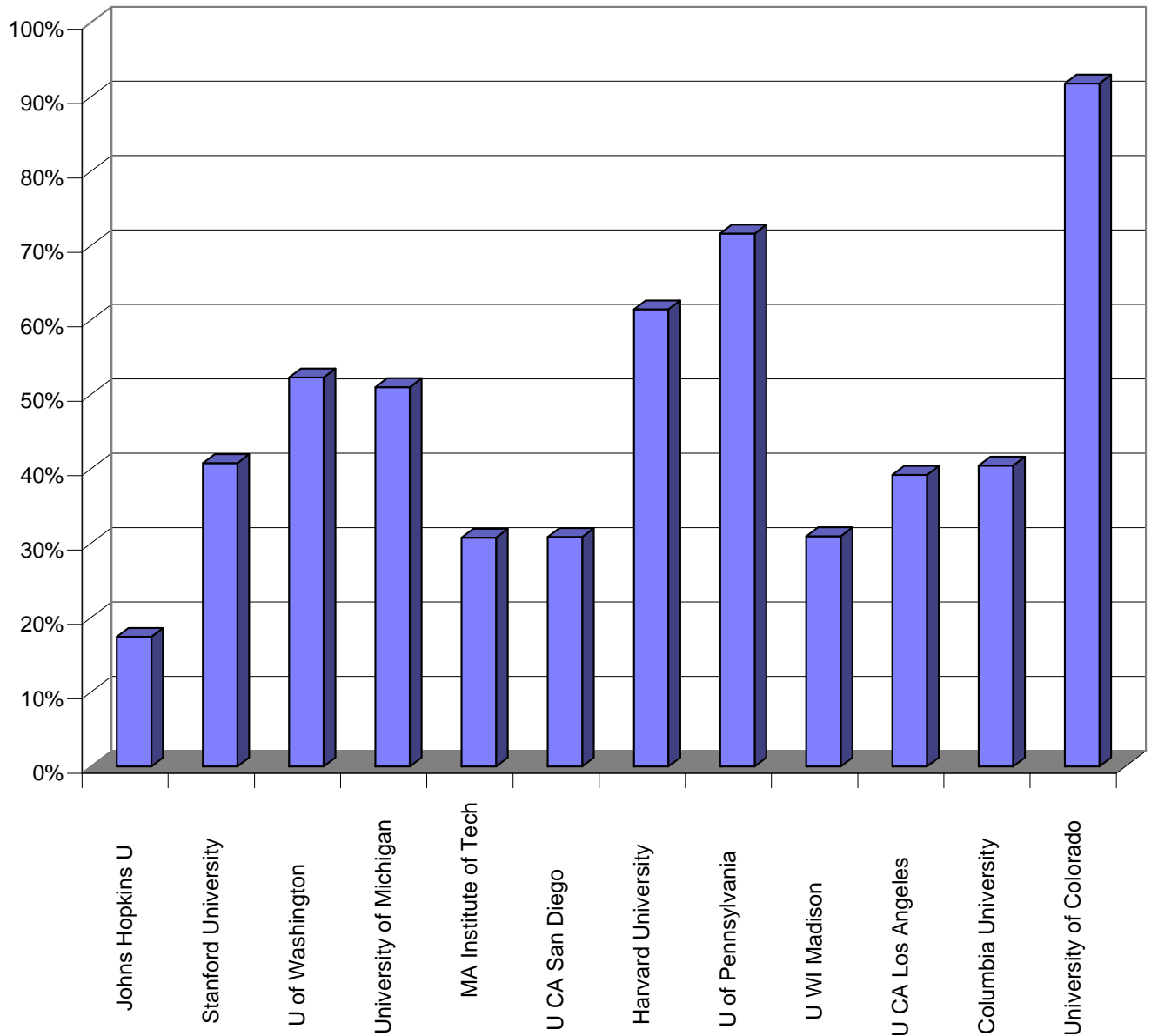


Figure A3.4. Percentage Increase in federally financed R&D expenditures at top 12 universities and colleges: fiscal years 1991-1998 (public and private). This shows the success that CU/Boulder has had in increasing federal research dollars compared to all other institutions.

Johns Hopkins University includes Applied Physics Laboratory, with \$425 million in federally financed R&D expenditures.

Source: National Science Foundation /SRS, Survey of Research and Development Expenditures at Universities and Colleges, Fiscal Year 1998

**Table A-3.1. R&D expenditures at public universities and colleges,
by source of funds: fiscal year 1998**

[Dollars in thousands]

Institution and ranking	Total	Federal Govt.	State & local govts.	Industry	Institu- tional funds	Other
Total, all institutions	17,391,022	9,016,467	1,757,863	1,267,036	4,218,736	1,130,920
1 University of Michigan	496,761	311,450	3,962	33,029	107,004	41,316
2 U CA Los Angeles	447,367	233,702	8,676	27,817	114,359	62,813
3 U WI Madison	443,695	240,513	38,627	14,371	97,481	52,703
4 U of Washington	432,383	336,748	9,314	38,370	40,182	7,769
5 U CA Berkeley	420,435	171,135	47,961	20,483	144,016	36,840
6 U CA San Diego	418,790	262,303	19,548	26,814	70,535	39,590
7 Texas A&M University	393,720	144,938	90,685	33,674	117,593	6,830
8 U CA San Francisco	379,970	219,912	16,024	34,267	64,241	45,526
9 Pennsylvania State U	362,643	186,274	13,075	63,319	99,975	0
10 University of Minnesota	360,323	204,741	47,080	24,094	55,465	28,943
Total, 1st 10 institutions	4,156,087	2,311,716	294,952	316,238	910,851	322,330
11 U of Illinois Urbana	338,841	168,871	35,493	13,917	106,797	13,763
12 University of Colorado	311,203	228,342	5,139	9,963	32,795	34,964
13 University of Arizona	302,328	161,999	8,874	16,392	103,059	12,004
14 Ohio State University	301,518	124,177	53,987	40,401	59,746	23,207
15 U CA Davis	288,796	114,912	19,249	14,077	117,639	22,919
16 University of Florida	274,862	106,510	56,713	21,393	79,558	10,688
17 Georgia Institute of Tech	259,233	113,643	13,400	58,377	73,813	0
18 NC State University	254,254	79,533	88,497	31,429	49,831	4,964
19 U TX Austin	244,843	165,082	15,094	31,326	28,445	4,896
20 U of NC Chapel Hill	235,296	171,505	29,691	4,860	29,240	0
Total, 1st 20 institutions	6,967,261	3,746,290	621,089	558,373	1,591,774	449,735

SOURCE: National Science Foundation/SRS, Survey of Research and Development Expenditures
at Universities and Colleges, Fiscal Year 1998, Table B-36.

**Table A-3.2 Total R&D expenditures at universities and colleges:
fiscal years 1991-1998**

[Dollars in thousands]

Institution and ranking	1998	1997	1996	1995	1994	1993	1992	1991
Total, all institutions	25,735,268	24,187,601	22,961,974	22,097,902	20,965,816	19,950,563	18,817,827	17,585,279
1 Johns Hopkins U ¹	853,620	829,241	798,468	788,687	784,043	745,515	735,542	710,095
2 University of Michigan	496,761	483,485	468,876	443,070	430,778	425,868	393,059	363,582
3 U CA Los Angeles	447,367	374,629	354,645	303,668	279,869	277,974	270,954	250,033
4 U WI Madison	443,695	419,810	412,570	403,541	392,718	372,362	352,706	326,489
5 U of Washington	432,383	409,959	406,472	389,160	353,945	335,329	313,514	274,423
6 U CA Berkeley ²	420,435	356,813	316,320	291,200	289,632	284,346	284,545	258,038
7 U CA San Diego	418,790	378,061	371,509	357,333	331,901	307,051	282,114	261,422
8 MA Institute of Tech ²	413,098	410,930	380,612	370,800	374,768	377,413	333,908	323,535
9 Stanford University	410,309	395,310	351,526	318,871	318,561	306,676	367,980	314,941
10 Texas A&M University	393,720	366,798	366,983	362,539	355,750	322,691	305,390	288,005
Total, 1st 10 institutions	4,730,178	4,425,036	4,227,981	4,028,869	3,911,965	3,755,225	3,639,712	3,370,563
11 U CA San Francisco	379,970	334,206	320,757	329,742	312,393	314,599	295,784	268,700
12 Cornell University ²	363,511	351,030	339,534	343,786	312,683	310,949	299,342	309,535
13 Pennsylvania State U	362,643	339,955	337,938	330,881	302,997	282,659	278,305	267,816
14 University of Minnesota	360,323	363,095	341,179	336,524	317,865	332,033	317,026	331,471
15 U of Illinois Urbana	338,841	286,470	268,995	246,174	245,407	252,811	251,970	243,380
16 U of Pennsylvania	333,477	296,141	288,430	272,393	251,461	233,829	222,424	198,221
17 University of Colorado	311,203	269,816	251,301	243,932	234,267	193,217	176,266	160,526
18 Harvard University	306,100	299,961	282,443	276,422	278,459 e	257,207	253,126	229,939
19 University of Arizona	302,328	285,278	279,656	292,351	269,939	235,528	221,999	213,726
20 Ohio State University	301,518	289,100	262,147	246,287	230,515	221,460	203,291	194,919
Total, 1st 20 institutions	8,090,092	7,540,088	7,200,361	6,947,361	6,667,951	6,389,517	6,159,245	5,788,796

¹ Johns Hopkins University includes Applied Physics Laboratory, with \$443 million in total R&D expenditures.

² These data do not include R&D expenditures at university-associated federally funded research and development centers.

SOURCE: National Science Foundation/SRS, Survey of Research and Development Expenditures at Universities and Colleges, Fiscal Year 1998, Table B-32.

**Table A-3.3 Federally financed R&D expenditures at
universities and colleges: fiscal years 1991-1998**

[Dollars in thousands]

Institution and ranking	1998	1997	1996	1995	1994	1993	1992	1991
Total, all institutions	15,076,571	14,419,502	13,802,267	13,297,240	12,618,208	11,956,290	11,092,412	10,234,210
1 Johns Hopkins U ¹	752,983	724,526	710,119	706,049	711,692	673,601	666,696	641,239
2 Stanford University	342,426	332,272	295,373	273,157	268,559	254,379	265,687	243,219
3 U of Washington	336,748	320,784	312,695	291,284	281,033	268,819	257,840	221,124
4 University of Michigan	311,450	296,028	281,062	275,956	264,722	249,951	223,452	206,276
5 MA Institute of Tech ²	310,741	311,396	271,544	273,543	270,718	267,414	237,972	237,667
6 U CA San Diego	262,303	274,860	291,917	284,445	266,166	243,149	219,843	200,451
7 Harvard University	251,876	222,612	203,047	203,965	190,183	181,969	174,632	156,014
8 U of Pennsylvania	247,914	217,125	216,167	200,895	186,409	173,593	159,574	144,451
9 U WI Madison	240,513	233,760	233,174	229,381	225,403	213,955	199,816	183,652
10 U CA Los Angeles	233,702	238,919	236,635	201,773	190,202	189,065	180,743	167,885
Total, 1st 10 institutions	3,290,656	3,172,282	3,051,733	2,940,448	2,855,087	2,715,895	2,586,255	2,401,978
11 Columbia University	229,723	212,180	195,652	206,495	203,101	182,696	174,777	163,561
12 University of Colorado	228,342	192,201	177,517	169,666	158,163	138,584	129,894	119,068
13 U CA San Francisco	219,912	229,323	221,864	224,271	213,252	210,148	202,283	190,936
14 Yale University	205,046	189,124	176,994	174,868	171,425	168,900	157,345	149,506
15 University of Minnesota	204,741	200,149	198,927	194,819	181,039	174,716	165,926	164,887
16 Cornell University ²	204,187	205,521	203,082	207,391	193,981	195,229	180,361	173,478
17 U of Southern California	190,547	191,809	179,281	163,606	149,735	149,965	141,713	132,230
18 Washington University	187,173	186,993	155,197	146,921	138,299	129,482	123,863	112,475
19 Pennsylvania State U	186,274	185,206	190,688	187,481	168,679	160,152	151,877	146,212
20 California Inst of Tech ²	177,748	164,225	142,474	120,723	112,502	103,888	99,198	100,820
Total, 1st 20 institutions	5,324,349	5,129,013	4,893,409	4,736,689	4,545,263	4,329,655	4,113,492	3,855,151

¹ Johns Hopkins University includes Applied Physics Laboratory, with \$425 million in federally financed R&D expenditures.

² These data do not include R&D expenditures at university-associated federally funded research and development centers.

SOURCE: National Science Foundation/SRS, Survey of Research and Development Expenditures
at Universities and Colleges, Fiscal Year 1998, Table B-33

Appendix B-1

Faculty Input to Task Force

TO: Boulder Campus Department Chairs and Directors
FROM: Daniel N. Baker, Chair of the Research Task Force
DATE: October 14, 1999
RE: Questions for Department Chairs and Directors from Research Task Force

Phil DiStefano has convened a Task Force to study the research efforts on the Boulder campus. The other members of the Task Force are: Kristi Anseth, Christopher Braider, Melvyn Branch, John DeFries, Oliver Gerland, Leslie Leinwand, Uriel Nauenberg, and Robert Schulzinger. Phil has asked that the Task Force attempt to answer the following questions:

Strategic Questions:

Where does the Boulder campus want to be in its research efforts and the integration of research with education and service in the next five and ten years? What works well now and what does not (strengths, weaknesses, opportunities, barriers)?

Tactical Questions:

1. How can the campus better support investigators as individuals and as collaborative groups?
2. How can researchers collaborate effectively between disciplines, campuses, and universities?
3. How can technology be utilized to support research efforts?
4. Are there potential or existing areas of sponsored research opportunities given our strength, needs, and funding possibilities?

Phil has asked that the Task Force report its findings by the end of December. In order to meet this aggressive schedule, we had a brainstorming session to develop a list of key areas where recommendations might be made. Those initial ideas are captured in the following points:

1. Devise a strategy to take advantage of local businesses and increase contributions for research from these Colorado companies.
2. Approach the State for funds for start-up packages for new faculty members.
3. Increase support for the Graduate School to enable better support of research. Possible sources of funds for such increase are: a) the \$750k interest the Boulder campus will no longer pay on grants and contracts between the date expenses are incurred and the date the funding agency pays the expenses and b) the 2% increase in the ICR rate.
4. How do we get corporate or other outside supporters to approach the State to get additional sources of funds. These funds would provide matching funds for which the outside supporters might provide another portion, or support of new initiatives which are of particular interest to these outside supporters. This additional funding must be obtained without reducing funding to some other area.

5. Develop mechanisms to provide broader opportunities for faculty to perform research. Suggestions include internally funding faculty time for research during the academic year and summer. Augment sabbaticals and faculty fellowships. Possible ways to do this are allowing the course load to be spread over the entire 12 month calendar rather than just spring and fall or to allow use of research funds for buyout of a portion of the teaching load.
6. Adjust the administrative structure of the University to elevate the presence and support of research on the campus. Included in this recommendation would be an increase in funding for the Office of Contracts and Grants.
7. Make best use of ICR to enhance research. Approximately 29% of ICR funds is returned to the generating department(s). The actual usage of the remaining 71% should be analyzed with particular note towards how it supports the research which generates the funds.
8. Remove the difference in Graduate School tuition for in-state and out-of-state students.
9. Optimize faculty participation in the Institutes. This may require more Institutes or other ways to get faculty involved in the existing Institutes.
10. Return all ICR related to grants transferred in by new faculty members to the department to help provide start-up funds (perhaps limit to current term of grant or first year only).
11. Become more entrepreneurial. How can we open up to more creative partnerships between faculty and other entities (foundations, industry, businesses, etc.)?

The Task Force would like to solicit input from the Boulder campus as we develop our recommendations. Specifically, we would like your feedback on the above questions and ideas. Do you have anything you would like added? Do you have any comments? Anything else?

Please send comments to Research.Task.Force@lasp.colorado.edu by October 25, 1999. If you have any questions or want to discuss your thoughts in person, please feel free to call any Task Force members.

Thank you for your assistance.

Appendix B-1 (Continued)

Summary CU Boulder Chairs and Faculty Responses to Research / Creative Works Task Force

Research Infrastructure and Reporting

1. Improve the resource infrastructure for research (e.g., computer systems support, facilities management coordination of renovations and repairs)
2. Recommendation for the creation of a Vice Chancellor for Research position, and more support for the Graduate School and research on campus.
3. Recommend action for more support for administration of research grants, building renovation, matching funds, and "getting researchers involved in education projects." With regard to the fostering of research collaboration, it was stated that "the presence of research institutes has meant a tremendous boost to interdisciplinary research at CU. These units should be nurtured and allowed to grow."

ICR

4. In grants charged less than the negotiated IDC rate, still return ICR to the Dept./Institute. Currently, none of the ICR from these awards goes back to the primary unit. **(per Larry Nelson – this used to be true but now all goes back to departments)**
5. Ascertain what the campus ICR covers and does not cover and explore whether operations fundamental to research are being paid from research grant monies.
6. An Institute recommended that higher than normal DAICR should be returned to those units that occupy older buildings and, thereby, incur extra costs for renovation, asbestos abatement, etc. The Executive Director of Facilities Management confirmed that this inequity exists among units, but abstained from recommending a source of funds to rectify the problem. However, he clearly stated that "Facilities Management is not funded to take care of this issue." Concern was also expressed about paying for the telephone costs of teaching faculty from DAICR, excessive charges by Facilities Management, and the charging of installation, renovation and repair costs to unit investigators.
7. Suggestion that the new 2% ICR increase be allocated directly to departments or researchers. This could be part of the overall discussion on whether the present ICR distribution is optimal to promote our research activities.

Tuition

8. Eliminate out-of-state tuition charges for graduate student research assistants. (make it equal to the in-state tuition rate)
9. Graduate tuition for foreign students should be made equivalent to in state.

Faculty

10. Improve mechanisms for hiring and retaining faculty (e.g., funding sources for start-up packages)
11. Seriously consider a real Trimester system. Faculty could then teach part of their regular course load during the summer semester with some resulting flexibility for research.
12. Improve faculty access to seed money for small grants.
13. Recognize the time spent supervising students in research as part of the teaching load. Formal recognition of this effort would facilitate the incorporation of the research experience as part of the undergraduate educational experience.

Institutes

14. Some department chairs complain that Institutes do not give appropriate credit to the departments in which their faculty are rostered. For example, quite often when members give a talk or write a paper they refer to the Institute but not the department. It is important to give visibility to the department. This may attract more students if it is realized that the institutes are associated with the department to which they are applying.

CU Foundation

15. Efforts to fund raise from alumni and corporations should be intensified. General concerns about the Foundation have been raised.

Outreach

16. A better job of educational outreach to the public to explain the importance of research can be done. Maybe the Foundation and Alumni Association offices should be involved in this discussion.

Humanists, Artists, and Social Scientists

17. Department chairs voiced concerns of Humanists, Artists, and Social Scientists. The major issues relate to three closely interconnected themes: 1. A perceived lack of representation of their disciplines in the way the campus conceives of research (and thus even of "research-and-creative-work"); 2. Inadequate funding and a failure to understand and focus on the special problems funding poses in these disciplines; 3. Teaching loads, which are generally far higher in these disciplines. Approaches such as buy-outs (as opposed to course banking) are largely unheard of (except, of course, at the "hard" end of the social sciences).
18. Other issues of concern to department chairs: 1. The role of the Graduate School and the suggestion that its functions should devolve on the various Schools and Colleges in which graduate teaching and research actually occurs; 2. Misgivings about the Institutes and the wisdom of advancing an Institute model of research; 3. A perceived failure to focus properly on intramurally, as opposed to extramurally, funded research; 4. Wariness of research partnerships with business; and 5. The suggestion that the Task Force might propose treating tuition revenues in the way the campus currently treats (at least in theory) ICR, i.e., as a revenue base for which the units that generate it ought to be compensated.

Appendix B-2

Notes from Task Force meeting with Chief Research Officer

Carol Lynch

The meeting began with a general discussion of the Task Force objectives and solicitation of Carol's input on the general topic of ways to increase support for research at CU.

- Carol reiterated that outside supporters are needed to approach the state. Her Graduate School Advisory Council has a committee willing to fulfill this function.
- The CU Foundation should be involved in obtaining funds for research . Carol recommended having the Foundation solicit support from local companies.
- Carol specifically recommended that the Task Force invite Linda Bachrach from the Foundation to a future meeting.

The survey for peer institutions was discussed. Carol offered to develop the survey and then send it to her contacts, in hopes of obtaining a higher response level. Some discussion of the survey itself was held.

Carol was asked if her office is adequately funded to handle the demands put upon her. Following are her comments regarding funding:

- The funds available to her office for equipment matching should be indexed to grant success (i.e. to the demand). The amount available has been flat for an extended period of time.
- Funding for the AVCR and OCG offices should be indexed to the level of research funding so that they keep pace with the increased workload. One way to accomplish this is for her office to receive an explicit percentage of the ICR generated by research programs.
- There is no funding source for new pilot ideas. This area might generate some future research revenue with only a minor investment up front.

Appendix B-3

Notes from Task Force meeting with Director of OCG

Larry Nelson

Resources Supplied by Larry Nelson:

- ◆ Research Administrative Services Survey from the University of Michigan
- ◆ OCG Organization Chart
- ◆ Chart with Dollar Value of Awards and Expenditures at CU from 1977 through 1999
- ◆ Chart with OCG Operating Expense as a Percentage of Award Dollars
- ◆ Chart with number of Active Accounts, Proposals, Awards, and Unfunded Award Modification Actions from 1977 through 1999
- ◆ OCG statistics (similar to above charts)
- ◆ Sponsored Project Proposal Success Rate Chart and supporting detail
- ◆ Rate Agreement for Boulder Campus Overhead rate
- ◆ Awards Received by Funding Agency FY 1993 – FY 1999
- ◆ Sponsored Project Awards Received at UCB by Academic Unit 1968 – 1999
- ◆ Listing of Awards Received by Type of Funding Agency
- ◆ Notebook of Awards by Campus Unit by Funding Source for FY 1995 – FY 1999

Recommended web sites:

- ◆ Web site with links to most University Departmental and Sponsored Research Offices. Larry also supplied printouts from some of these sites:
<http://www.crpc.rice.edu/ncura/sponsored.html>
- ◆ AAAS FY 2000 Budget for R&D. <http://www.aaas.org/spp/dspp/rd/fy00.htm>
- ◆ Reminder about OCG website with searchable database at: www.Colorado.edu/ocg/
- ◆ Community of Science website: <http://www.cos.com/>

If anyone would like copies of any of this information, please let me know.

Selected Comments from Larry:

- ◆ Due to the continuous imposition of time requirements for items such as ASP, CPP, and other continual additional requirements, his office needs more staff. With things staying the same, more people are needed to share information with user departments (individual training with user departments), handle electronic submissions (such as NSF FastLane), and handle other on-going requirements. Technical developments may increase or decrease the future staffing needs but the effect is not predictable until implemented (the Sponsored Program modules may either require extra resources or may save time, depending on the final implementation design.)
- ◆ The CU Boulder OCG office performs functions beyond that provided by similar offices in other universities or other branches of CU (such as copying and mailing proposals and preparing budgets).
- ◆ OCG has kept up with the increasing work load through technology, very low turnover, a commitment to quality, and a very competent staff.

- ◆ When asked about a particular indexing matrix for funding of research support, Larry did not think any one specific measurement would correlate well. He recommended a group of indicators with weighting. Examples would include the number of proposals submitted, number of awards received, trends in government funding and federal budget, and any indication of changes in renewal proposal rejections.
- ◆ Larry indicated that Boulder has the lowest ICR return rate of any CU campuses.
- ◆ Larry emphasized that the 90% of research funds being generated directly or indirectly from federal funds has been a very consistent proportion over time. We should not view such a high percentage as a bad thing: Federal funding is relatively stable and reliable.
- ◆ Larry feels the reason for our high success rate is due to the quality of the proposals and the good ideas being proposed. Based on that, his biggest concern about the continuation of our success in research revenue is the low faculty salaries and subsequent retention of our best faculty.
- ◆ Earmarked funds are the largest untapped area. We have just recently begun to pursue these with some success. These must be developed from the President's office.
- ◆ Larry said that we rarely lose awards due to lack of matching funds; the quality of the CU Boulder science and scholarly work is at such a high level that matching or cost sharing is not an issue in whether we are funded.
- ◆ Larry has regular (every 2 weeks) meetings with Carol Lynch and finds her to be very supportive. He feels she conveys any specific concerns he has to the Chancellor.
- ◆ Possible recommendation: Ric Porreca should meet with Larry and /or Carol Lynch and Jerry Peterson on a more frequent basis due to the importance of research funding to the entire University budget.

Appendix B-4

Notes from Task Force meeting with V.C. for Budget and Finance

Ric Porreca

The Task Force asked specifically about Ric's view on how research is represented on university committees. Ric sits on many committees but his position is intended to be neutral. He indicated that Carol Lynch is on many of the same committees as is Phil DiStefano which, in Ric's opinion, provides a forum for research concerns to be represented. Ric expressed concern that separating Research and Academic Affairs at the Vice Chancellor level would send the wrong message about competition between academics and research. He mentioned that some institutions use a Provost position to merge those functions or that a Sr. Vice Chancellor position might work to reduce the impression of competition.

Ric feels that research is represented well on the campus but not at the state level or with the local business community. He agreed with the need to organize the various advisory committees across campus to approach outside entities.

In discussing the distribution of the ICR to the generating department, Ric expressed a concern that allocating the ICR to the areas that incur the expense (as defined in the cost study) would be prudent management, but potentially harmful to research active departments unless they are provided with enough funds to fully cover instructional costs.

Ric was asked about the tuition rate for students working on grants. He thinks that the Board of Regents may have the authority to set the tuition rate for people working on grants.

There was an open discussion on the University overhead rate and appropriate ways that rate might be increased. Ric noted that there is a library component to the rate which could perhaps be increased if closer tracking were made of the library usage directly related to research. He stressed that the effort must be related to sponsored research. Also, investment in certain research buildings could help the rate. He indicated that Jeff Lipton is a good resource in this area.

Appendix B-5

Notes from Task Force meeting with C.U. Foundation

Linda Bachrach and Paul Bauman

In prior Task Force meetings, the CU Foundation was pointed to as a potential source of funds for research efforts. Much emphasis was put on how ineffective the Foundation is at generating funds for CU compared to fund raising efforts at other Institutions.

The CU Foundation has gone through many changes recently. Of the current staff, more than half have been at the Foundation less than 2 years. Employees are located at the 4 campuses with another significant group at the Foundation central office (over 170 employees in total). The Foundation is struggling to keep up the infrastructure. Retention and attraction of high quality personnel is a problem due in part to non-competitive salaries.

Arthur Andersen & Co. consults in the area of foundation management and might be a reference source to contact. Also, the Univ. of Virginia has been very successful in fund raising and should be viewed as a good model to examine.

The CU Foundation is a very young group with under 25 years experience. It is a self directed organization, governed by a volunteer board of directors. The board selects the chief operating officer, sets the policy, and has responsibility for all private gifts contributed to the Foundation. We could not determine if a review, similar to the Program Reviews done of each department and institute, has been conducted for the Foundation.

CU has a centralized Foundation as compared with other schools. In some peer institutions, the individual colleges hire the fund raising resource that will work in that school. In the CU approach, communication and cooperation between the groups is extremely important. We appear to have both communication breakdowns and competitive encounters which damage the ability to raise funds. Some organizational development work could make the Foundation function more effectively. It may be that a decentralized approach is more appropriate. At the least, some better communication needs to be established between the central Foundation, various campuses, and various colleges.

At CU, Engineering has 5 dedicated development officers with an objective of \$55 million. The current Engineering faculty feel under-served and feel they could fully utilize up to 15 development people. Engineering has an established program which has both college wide and unit based campaigns.

A&S and the Graduate School has 9 personnel, of which 6 work with donors. A new approach is being tried with one person dedicated to obtaining corporate matching gifts.

While many faculty members have horror stories about the Foundation, it should be noted that the Foundation has an equal number of horror stories about faculty. Boulder CU faculty have been conservative about developing corporate relations. Donors love to meet with faculty,

especially corporate donors. The Foundation needs help getting faculty members to understand the importance of meeting with donors and what role they can play in soliciting funds.

The ability to pay competitive salaries for new Foundation employees is crucial. As a case in point, an employee making roughly \$30,000 per year is not seen as a peer by major corporate donors when requesting multi-million dollar gifts.

Some statistics provided about fundraising are:

- The cost for an endowed chair begins at \$1.5 million for the humanities and the arts but can exceed \$3 million for the sciences.
- Last year there were 11 gifts of \$1 million or more compared to 3 the year before.
- Last year saw a dramatic increase in funds raised by the Foundation for the Boulder campus, increasing from \$40 million in 97-98 to \$56 million in 98-99 and with a projected goal of \$65 million for 99-00.

Compared with other peer institutions, CU is significantly behind in raising funds from outside donations. The reports of the funding available at other schools point out just how much needs to be done at CU. Due to the relative youth of the Foundation and lack of a habit of giving from alumni, the Foundation has a difficult task to move forward. Progress is being made and the new personnel have contributed significantly to that progress. Various objectives have been set as measurements of our ability in this area, such as the number of endowed chairs. The support structure for the development officers needs to be examined so that each department can maximize its income from alumni, foundations and corporate donations.

Appendix C-1

Research Questionnaire Sent to Peer Institutions

Survey of University Research Officers, Resources, and Programs

CONTACT INFORMATION

Name of institution _____

Name & email of survey respondent _____

Address of respondent _____

Would you like to receive a summary of the survey results? yes _____ no _____

Is there a medical school on your campus? yes _____ no _____

We would like to exclude medical school information from survey responses. Please indicate if you can exclude the medical school from the information requested. yes _____ no _____

RESEARCH OFFICE (Please provide an organizational chart for the Research Office)

1. What is the title of the **Chief Research Officer** for your institution? _____

To whom does the CRO report? _____

What is the size of the budget and staff for the CRO? _____

2. What services are provided by your **Office of Contracts & Grants (OCG)**?

_____ proposal development assistance (locating funding sources)

_____ proposal editing/writing assistance

_____ proposal budget assistance

_____ approval of outgoing proposals

_____ preparation of indirect cost proposals

_____ contracts/grants negotiations

_____ internal review and awards (seed money, matching funds)

_____ administration of grants received

_____ other _____

How many staff members work in OCG? _____

What is the annual budget for OCG (operating budget, salaries, etc.)? \$ _____

What is the work load of OCG (last year's figures) ?

number of proposals submitted _____

number of awards/contracts processed _____

total dollar amount of awards _____

Does your OCG have an enforced deadline by which investigators must get proposals to OCG?

If so, what is the deadline? _____

3. To whom does the **Technology Transfer Officer** report? _____

How many staff members work in the Tech Transfer Office? _____

What is the budget for the Tech Transfer Office (operating budget, salaries)? \$ _____

What are the main responsibilities/functions of the Tech Transfer Office?

- technology transfer
- intellectual property rights
- patents, trademarks and copyrights
- outreach to industry/businesses
- educating faculty in technology transfer matters
- other _____

RESEARCH FUNDING

4. What percent of your **campus budget** comes from the state? _____ %
What was the total of your **sponsored project awards** for 1998-9? \$ _____
Is the budget for sponsored research included in this institutional budget? yes _____ no _____

What, if any, additional funding does the state provide to support research (e.g., matching funds, building funds, research staff salaries)? _____

5. What is your **Indirect Cost Rate (ICR)**? _____ %

How are indirect cost redistributed within your institution? (*should add up to 100%*)

- % President's Office
- % Chief Research Officer's Office
- % Grantee's college/school
- % Grantee's department
- % Institution's general fund
- % Returned to state
- % Libraries, physical facilities
- % Other _____

6. By discipline, what is the range of **start-up packages** you offer to new faculty?

- \$ _____ - _____ Arts
- \$ _____ - _____ Humanities
- \$ _____ - _____ Natural Sciences
- \$ _____ - _____ Social Sciences
- \$ _____ - _____ Engineering

What types of assistance may be included in the start-up packages?

- laboratory space
- equipment
- post doc/student support
- faculty summer salary
- researcher expenses (conferences, travel, professional memberships, etc.)
- other _____

What is the source(s) of start-up funds on your campus?

- President's Office/Chancellor's Office
- Chief Research Officer's Office
- Chief of Academic Affairs Office
- Dean of college/school
- department
- other _____

7. What is your total budget for **internal, centralized funding** for research/creative work?

\$ _____

How are these funds administered? _____

Does your institution offer the following types of support and in what amounts?

_____ matching funds for grants, projects \$ _____
_____ research grants and travel grants \$ _____
_____ funds to hold events, symposia, conferences \$ _____
_____ funds to support publication costs \$ _____
_____ funds to support proposal writing \$ _____
_____ summer grants \$ _____
_____ other _____ \$ _____

What is your institutional budget for library support? \$ _____

How is it broken down by discipline/unit/department?

_____ Arts \$ _____
_____ Humanities \$ _____
_____ Natural Sciences \$ _____
_____ Social Sciences \$ _____
_____ Engineering \$ _____
_____ other \$ _____

Do you offer support for Research Faculty (non-tenure-track faculty)?

_____ regular salary
_____ backup salary
_____ teaching stipends
_____ other _____

8. Does your institution offer **sabbaticals** for the faculty? yes _____ no _____

How frequently are sabbaticals offered by your institution? _____

What percentage of a faculty member's salary is covered by the sabbatical? _____ %

How long are sabbatical leaves?

_____ one-semester
_____ academic year
_____ full year
_____ other _____

What other funds are available to support faculty on sabbaticals

_____ teaching replacements
_____ research assistance
_____ travel/relocation funding
_____ other _____

RESEARCH PROGRAMS

9. What is the role of **organized research units** (institutes, centers) at your university?

What percentage of your faculty are affiliated with institutes/centers? _____ %

To whom do the major institutes and centers report? _____

What percentage of research grants and contracts are awarded to institutes and centers? _____ %

Do institutes/centers pay ICR at same rate _____, higher rate _____, or lower rate _____ ?

What is the relationship between the institutes/centers and the departments? _____

10. What programs do you have to encourage **collaboration** among faculty researchers and the local community?

_____ outreach programs
_____ industry/university partnerships
_____ business/Industry advisory board
_____ humanities/Arts collaborations (councils, advisory boards, partnerships)

_____ Other _____

COMMENTS

11. What is the **most serious challenge** facing your research program?

12. What is the **most effective thing** that your institution does to support research?

Please return the completed survey
by **November 15, 1999**, to:

Caroline Himes
LASP
University of Colorado at Boulder
Boulder, CO 80309-0590

Appendix C-2

Survey of University Research Officers, Resources, and Programs	Univ. of Colorado	Univ. 1	Univ. 2	Univ. 3	Univ. 4
1. Title of Chief Research Officer	Assoc. VC for Research	Vice Chancellor for Research	Vice Chancellor for Research	Vice Chancellor for Research	VP for Research & Dean of Grad. Sch
CRO reports to	VC for Academic Affairs	Exec. Vice Chancellor	Chancellor	Chancellor	President
Budget for CRO	\$3.4M	\$25 M	\$2.4M	\$8.9M	\$13M
Staff for CRO	29	100	22.5	10.5	
2. What services are provided by OCG?					
proposal development	X		X		
proposal editing/writing		X			
proposal budgets	X		X (limited)	X	
approval of outgoing proposals	X	X	X	X	
preparation of indirect cost proposals				X	X
contract/grant negotiations	X	X	X	X	
internal review and awards (seed money, matching funds)			X		
administration of grants received	X	X		X	X
Other	mailing, copying, training	subcontracts			Effort reporting
How many staff members in OCG	17	12	8.5	38	18
Annual budget for OCG	\$760k	\$1.1M	\$445k	\$1.5M	\$768,500
What is the work load of OCG?					
# of proposals submitted	1596	816	1470	1728 (excludes annual renewals)	Pre-award handled by VP Research
# of awards processed	1523	1115	1044	1639, first time 893	
Total dollar amount of awards	\$204M	\$72M	\$102M	\$369M (incl. One \$170M award)	
Do you have an enforced deadline for proposals to OCG?	No	No	4 days, not enforced	5 days, not enforced	3 days but not enforced
3. Tech. Transfer Officer reports to:	Asst. VC for Research	VC for Research	President	VC for Research	Separate corporation
How many staff members?	1.5	10		8	9
Budget for Tech Transfer office	\$110k	\$650k		\$2M	\$.5M
Responsibilities of Tech Transfer Office?					
Tech transfer	X	X		X	X
Intellectual property rights	X	X		X	X
patents, trademarks, copyrights	X	X		X	X
outreach to industry/business	X	X		X	X
educating faculty in tech transfer	X	X		X	X
other		Materials tsf agmts, industry-sponsored research, Univ. Research Park, Econ. Devel.			

Survey of University Research Officers, Resources, and Programs	Univ. 5	Univ. 6	Univ. 7	Univ. 8	Univ. 9
1. Title of Chief Research Officer	VP for Research	Vice Chancellor for Research & Public Service	Vice Provost	VP for Research	Vice Provost for Research
CRO reports to	President	Provost	Provost	Exec. VP & Provost	Provost
Budget for CRO	\$11.7M	\$15M (state approp.)	\$1.6M		
Staff for CRO		12	48 (OCG & TTO)	2 Asst VP, 1 50% Assoc VP, 1 fiscal officer, 1 ofc/prog mgr, 3 support	20
2. What services are provided by OCG?					
proposal development	X	X		X	X
proposal editing/writing					
proposal budgets	X	X	X	X	X
approval of outgoing proposals	X	X	X	X	X
preparation of indirect cost proposals					
contract/grant negotiations	X	X	X	X	X
internal review and awards (seed money, matching funds)	X	X			X
administration of grants received	X	X	X	X	
Other		post award (purch, A/P, A/R, payroll, reporting)		purchasing and accting, training, systems	
How many staff members in OCG	20	60	18	40	17
Annual budget for OCG	\$1.4M	\$12.7M (ICR)	\$6M	2.5M	840K
What is the work load of OCG?					
# of proposals submitted	2659	1102	1400	2000	3700
# of awards processed	1762	657	800	1300	1900
Total dollar amount of awards	\$260M	\$78M	\$105M	200M	\$295M
Do you have an enforced deadline for proposals to OCG?	No	prefer 5 days, not enforced	3 days	No	No
3. Tech. Transfer Officer reports to:	VP Research	VC for Research	CRO	VP for Research	Provost
How many staff members?	2.3 Prof, 1.5 support	2	9	13 FTE	7
Budget for Tech Transfer office	\$188k + patent exp.	\$107k	\$37M	n/a	\$1.2M
Responsibilities of Tech Transfer Office?					
Tech transfer	1	X	X	X	X
Intellectual property rights	2	X	X	X	X
patents, trademarks, copyrights	3	X	X	X	X
outreach to industry/business	5		X	X	X
educating faculty in tech transfer	4	X	X	X	X
other	Tech transfer office also administers research park & Incubator			industry research contracts	

Survey of University Research Officers, Resources, and Programs	Univ. 10	Univ. 11	Univ. 12
1. Title of Chief Research Officer	VP Research	VP for Research	Vice Pres. For Research and Public Service
CRO reports to	President	President	President
Budget for CRO	\$2M	\$549k	1.7M
Staff for CRO		5	6
2. What services are provided by OCG?			
proposal development	X		
proposal editing/writing			
proposal budgets		X	X
approval of outgoing proposals	X	X	X
preparation of indirect cost proposals	X		X
contract/grant negotiations	X	X	X
internal review and awards (seed money, matching funds)	X		
administration of grants received	X	X	
Other	Federal relations		
How many staff members in OCG	30	22	15
Annual budget for OCG		\$1.1M	
What is the work load of OCG?			
# of proposals submitted	2800	1590	3200
# of awards processed	1800	2210	600
Total dollar amount of awards	\$146M	\$281M	\$170M
Do you have an enforced deadline for proposals to OCG?	Yes, 1 week	No	No
3. Tech. Transfer Officer reports to:	VP Research	VP for Research	VP Research
How many staff members?	8	8	2
Budget for Tech Transfer office	\$1.5M	\$557k	\$250k
Responsibilities of Tech Transfer Office?			
Tech transfer	X	X	X
Intellectual property rights	X	X	X
patents, trademarks, copyrights	X	X	
outreach to industry/business			X
educating faculty in tech transfer		X	X
other			

	Univ. of Colorado	Univ. 1	Univ. 2	Univ. 3	Univ. 4
Research Funding					
4. What % of campus budget from state?	11.90%	25%		28%	44% of general fund
What was sponsored project awards ?	\$204M	\$72M		\$233M	\$119
Is budget for sponsored research included in this budget?	Yes	Yes		Yes	Yes
What additional funding does state provide?	matching funds \$1.4M/yr, grants	building funds, partial return of ICR funds		\$10M	\$25M/yr for business & educ. Research in state
5. What is your ICR?	47.40%	50.40%		53%	49.50%
How are indirect costs redistributed within instution?					
Presidents office		7%		8%	
CRO		7%			
Grantee's college	29%	14%		92%	100%
Grantee's department	split with college	distrib through schools			
General Fund	71%	33%			
Returned to State		dist. Thru general fund			
Libraries, physical facilities		12%			
Other		26% Administrative			
6. What is range of start-up packages?		too variable			
Arts	\$0k - 5k			\$10k - 15K	\$8k - 20k
Humanities	\$0k - 5k			\$10k - 15K	\$8k - 12k
Natural Sciences	\$100k - 400k			\$200k - 500k	\$20k - 450k
Social Sciences	\$50k - 100k			\$10k - 15K	\$20k - 150k (psych higher)
Engineering	\$200k - 500k			\$300k - 600k	NA
What types of assistance may be included in start-up packages?					
laboratory space	X	X		X	X
equipment	X	X		X	X
post doc/student support	X	X		X	X
faculty summer salary	X	X		X	X
researcher expenses	X	X		X	X
other		relocation costs			
What is the source of start-up funds?					
President's / Chancellor Office					X
Chief Research Officer				X	X
Chief of Academic Affairs		X		X	
Dean of college/school	X	X	X	X	X
Department	X	X		X	
Other					

	Univ. 5	Univ. 6	Univ. 7	Univ. 8	Univ. 9
Research Funding					
4. What % of campus budget from state?	100%	41.30%	33%	45%	17%
What was sponsored project awards ?	\$260M	\$78M	\$110M	\$200 M - medicine	\$295M
Is budget for sponsored research included in this budget?	Yes	no	X		No
What additional funding does state provide?	matching funds, seed grants, central facilities subsidies	matching, start-up, research salaries	building	equip, Research devel, bldg/facilities	n/a
5. What is your ICR?	47.00%	45.50%	45%	46%	47.75%
How are indirect costs redistributed within instution?					
Presidents office		3.25%			9%
CRO		76.75%			30%
Grantee's college	3%	10%			
Grantee's department	3%		25%	as of 7/2000 - 100%	
General Fund	94%		75%	current - 100%	50%
Returned to State					
Libraries, physical facilities		5%			
Other		5% (PI or research unit)			OCG-1%, PI-10%
6. What is range of start-up packages?					
Arts	\$2k - 10k		\$0 - 10k	\$100k - 300k	\$10k - 20k
Humanities	\$2k - 10k		\$0 - 10k	\$50k - 100k	\$10k - 20k
Natural Sciences	\$10k - 200k	\$20k - 300k	\$50k - 500k	\$100k - 300k	\$25k - 500k
Social Sciences	\$2k - 5k		\$10k - 100k	\$100k - 300k	\$10k - 20k
Engineering	\$50k - 150k	\$20k - 100k	\$25k - 200k	\$100k - 300k	\$25k - 300k
What types of assistance may be included in start-up packages?					
laboratory space	X	X	X	X	X
equipment	X	X	X	X	X
post doc/student support	X	X	X	X	X
faculty summer salary	X	X	X	X	X
researcher expenses	X	X	X	X	X
other					
What is the source of start-up funds?					
President's / Chancellor Office					X
Chief Research Officer	X	X	X	X	X
Chief of Academic Affairs	X	X(Provost)			X
Dean of college/school	X	X	X		X
Department		X	X		X
Other					

	Univ. 10	Univ. 11	Univ. 12
Research Funding			
4. What % of campus budget from state?	18%	24%	10%
What was sponsored project awards ?	\$141M	\$281M	\$170M
Is budget for sponsored research included in this budget?	No	Yes	Yes (a portion)
What additional funding does state provide?	None		None
5. What is your ICR?	52%	50%	48.00%
How are indirect costs redistributed within instution?			
Presidents office			20%
CRO			2%
Grantee's college		18%	20% - 30%
Grantee's department			
General Fund	100%	69%	30%
Returned to State			
Libraries, physical facilities		5%	2%
Other		8%-renewal & replacement of fixed assets reserve	6%-Grad School, ITC, Health & Safety
6. What is range of start-up packages?			
Arts	\$5k - 10k		\$2k - 4K
Humanities	\$5k - 10k		\$2k - 4K
Natural Sciences	\$20k - 200k		\$100k - \$1M
Social Sciences	\$10k - 20k		\$2k - 4K
Engineering	\$20k - 250k		\$100k - \$1M
What types of assistance may be included in start-up packages?			
laboratory space	X		X
equipment	X		X
post doc/student support	X		X
faculty summer salary	X		X
researcher expenses	X		X
other			
What is the source of start-up funds?			
President's / Chancellor Office	X		
Chief Research Officer	X		
Chief of Academic Affairs	X		
Dean of college/school	X		X
Department	X		
Other	Research Fdn.		Endowment

	Univ. of Colorado	Univ. 1	Univ. 2	Univ. 3	Univ. 4
7. What is your total budget for internal centralized funding for research? How are these funds administered?	\$2.1M AVCR / CRO	\$3.5M direct line item, competitive, academic senate sponsored, etc.	\$1.1M for Office of Research	\$0.5M provost, \$3.5M Research Board, \$2M critical research initiatives	\$3M VP Research
Does your institution offer the following support and in what amounts?					
matching funds for grants, projects? research grants and travel grants	1.4M 1M	as required \$300k	3.5M X	\$2M \$5.5M	up to \$300k < \$5k
funds to hold events, symposia, conferences		\$20 - 25k	X		< \$5k
funds to support publication costs funds to support proposal writing	15k			\$50k- 75k	
summer grants other	60k	discretionary VCR - \$600k, computing and bridge funds - \$360k	X		\$6,500
What is your institutional budget for library support?	\$16.6M	\$17.1M		\$27.5M	\$22M
How is it broken down by discipline/department? (No respondents knew details)					
N/A					
Do you offer support for Research Faculty?					
regular salary backup salary teaching stipends other	X X			some	X

	Univ. 5	Univ. 6	Univ. 7	Univ. 8	Univ. 9
7. What is your total budget for internal centralized funding for research?		\$1.5M	\$4.5M	\$11M plus Bd of Reg. \$6M	\$1M
How are these funds administered?		small grants for new faculty and general research faculty	Committee decisions	peer reviewed competition	Approx. \$350k - Univ Research Council, balance discretion of Vice Provost for Research
Does your institution offer the following support and in what amounts?					
matching funds for grants, projects? research grants and travel grants	\$1.1M	\$5k up to 25% 750/trip	25% up to \$200k up to \$50k	1/9 equip. \$20k seed grants, \$1M interdisc. Focus areas	\$1M \$400k
funds to hold events, symposia, conferences		varies	\$250 or 25%	\$5k	\$100k
funds to support publication costs funds to support proposal writing			incl in internal grants CRO staff support	ad hoc - large scale projects	
summer grants other			7000/summer	shared facilities - \$2M, Tuition author. For GRA's \$6M	
What is your institutional budget for library support?	\$21.7M = \$12.8M Admin + 8.9M acquisitions	\$26M	\$11.7M	\$20M	\$13M
How is it broken down by discipline/department? (No respondents knew details)			NA		
Do you offer support for Research Faculty?				No	
regular salary backup salary teaching stipends other		admin support for soft money faculty	X X		X

	Univ. 10	Univ. 11	Univ. 12
7. What is your total budget for internal centralized funding for research? How are these funds administered?	\$1M VP Research	 through VP Research & Graduate Studies	\$300k Competitive Application
Does your institution offer the following support and in what amounts?			
matching funds for grants, projects? research grants and travel grants	\$1M \$550k		\$30k - 300k \$3k - 5K
funds to hold events, symposia, conferences			\$3k - 10k
funds to support publication costs funds to support proposal writing	\$40k		\$2k - 4k
summer grants other	\$300k		\$5k - 7.5k
What is your institutional budget for library support?	?	\$20.5M	\$15.5M for central, \$20M all, incl Health Sci, Law, Business
How is it broken down by discipline/department? (No respondents knew details)			
Do you offer support for Research Faculty?			
regular salary backup salary teaching stipends other	X X		X

	Univ. of Colorado	Univ. 1	Univ. 2	Univ. 3	Univ. 4
8. Do you offer sabbaticals? How frequently?	yes 1 every 7 years	yes on average 1 every 7 years		yes depends on length of time requested	Yes every 7 years
What % of salary is covered by sabbatical?	50% for AY	varies on length		25% - 100%	50 AY, 100% semester
how long are sabbatical leaves? one semester	X			X	100% salary
academic year full year other	X	varies on qtrs of credit		X X	50% salary
What other funds are available to support faculty on sabbaticals?					from outside sources
Teaching replacements	X				
research assistance	X				
travel/relocation funding					
other					
9. What is the role of organized research units?	Institutes- 53% of sponsored research dollars	Provide a focus for research with emphasis on interdiscpl work not performed in home dept.			Centers deal with specific issues and needs
What % of your faculty are affiliated with institutes?	5%	20%			15 - 20%
To whom do institutes report?	AVCR	VC Research		deans, provost, VC for Research	most to VP Research
What % of research grants are awarded to institutes?	53%	10%			17%
Do institutes pay ICR at:					
same rate	X	X		X	X
higher rate					
lower rate	only LASP				
What is relationship bet. Institutes and depts?	Institutes report to AVCR, faculty rostered in departments	Most ORU's have separate reporting status		varies	Most centers are interdisc or narrowly focused

	Univ. 5	Univ. 6	Univ. 7	Univ. 8	Univ. 9
8. Do you offer sabbaticals? How frequently?	Yes 1 every 10 semesters (competitive)	Yes 6 years	Yes 7 years	Yes every 7 years	Yes every 7 years
What % of salary is covered by sabbatical?	100%	50 AY, 100% semester	50 AY, 100% semester	66%	50 AY, 100% semester
how long are sabbatical leaves? one semester	100%	100% salary	100% salary	Y (quarter, research, periodically)	100% salary
academic year		50% salary	50% salary	Y (every 7 years)	50% salary
full year			Yes		50%
other					
What other funds are available to support faculty on sabbaticals?					Visiting institution support
Teaching replacements	X	X	X	Y	
research assistance	X		X	Y	
travel/relocation funding	X		X	Y	
other					
9. What is the role of organized research units?	Treated as separate reporting units	infrastructure & admin support, promote interdisc. Research	provide leadership and support in focus area	facilitate interdisc.research, train grad students, offer shared facilities	specialized research emphasis
What % of your faculty are affiliated with institutes?			10%	30%	30%
To whom do institutes report?	varies, some to depts, colleges, VP Research	VC for Research	CRO	colleges, 4 to VP for Research	Provost/Deans
What % of research grants are awarded to institutes?	13%	50%	9.60%		25%
Do institutes pay ICR at:					
same rate	X	X	X	X	X
higher rate					
lower rate					
What is relationship bet. Institutes and depts?	varies according to reporting & affiliation agreements	collegial	varies	Some report to depts. Generally some degree of competition re resource allocation	

	Univ. 10	Univ. 11	Univ. 12
8. Do you offer sabbaticals? How frequently?	Yes every 5 years	Yes	Yes By application
What % of salary is covered by sabbatical?	50 AY, 100% semester		50 AY, 100% semester
how long are sabbatical leaves? one semester	Y		100%
academic year full year other	Y at 1/2 salary support	X	50%
What other funds are available to support faculty on sabbaticals?			
Teaching replacements research assistance travel/relocation funding other		X	
9. What is the role of organized research units?	Interdisciplinary		Conduct multi-disciplinary research
What % of your faculty are affiliated with institutes?	20%		5%
To whom do institutes report?	VP Research		varies, if multi-disciplinary, to Provost
What % of research grants are awarded to institutes?	< 5%	46%	3%
Do institutes pay ICR at: same rate higher rate lower rate		X	X
What is relationship bet. Institutes and depts?	Dept based faculty can become members of cross dept inst.		Center members typically have separate funding from home departments

	Univ. of Colorado	Univ. 1	Univ. 2	Univ. 3	Univ. 4
10. What programs do you have to encourage collaboration among faculty researchers and the local community?					
outreach programs	X	X		X	X
industry/university partnerships	X	X		X	X
business/industry advisory board	X	X		X	
humanities/arts collaborations	X	X		X	
other					
11. What is the most serious challenge facing your research program?	Fragile and inadequate infrastructure space	Obtaining sufficient internal funds to foster interdiscipl. Research that leads to large center grant applications		finding \$ for start-up packages and matching funds	
12. What is the most effective thing you do to support research?	Office of Contracts and Grants - small but efficient, respected	Encouraging new organized research units		Provides \$3.5M in Research Board support on competitive basis. Avg awards <\$30k. Targeted toward new faculty, matches to equip grants, initiation of new projects, faculty between awards	

	Univ. 5	Univ. 6	Univ. 7	Univ. 8	Univ. 9
10. What programs do you have to encourage collaboration among faculty researchers and the local community?					
outreach programs	X	X	X	X	X
industry/university partnerships	X	X	X	X	X
business/industry advisory board	X	X	X	X	X
humanities/arts collaborations	X	X	X	X	X
other					
11. What is the most serious challenge facing your research program?	Maintaining & strengthening the research infrastructure through start-up for new faculty & refurbishing outdated labs & centers	space - need Research facilities recruiting & retaining exceptional faculty	providing infrastructure for expanding research programs	Balancing research resource needs among other high priority univ. initiatives Official recognition as flagship Land grant mind set	Start-up, cost-sharing
12. What is the most effective thing you do to support research?	Articulating the aspirations & needs of the research enterprise within an academic setting to secure funds for pilot grants, fellowships, new equip., & grant match. Most effective innovation has been creation of shared instrumentation facilities.	provide a strong infrastructure	internal matching for external grants	Seed grants for junior faculty, Tuition author. For GRA's, equip cost sharing, interdisc. Seminar grants, facilities construction/rennovation	small grants program - \$16k/grant

	Univ. 10	Univ. 11	Univ. 12
10. What programs do you have to encourage collaboration among faculty researchers and the local community?			
outreach programs	X	X	X
industry/university partnerships	X	X	X
business/industry advisory board	X	X	X
humanities/arts collaborations		X	
other			
11. What is the most serious challenge facing your research program?	Lack of space and institutional support for infrastructure	Obtaining funds	Infrastructure, space
12. What is the most effective thing you do to support research?	Encourage quality hires and focus on critical mass in key core research areas		Establish and support VP for Research & P. S. unit that (1) minimizes admin. diff. of applying for multi-discipl. grants (2) stimulate dialogue among researchers from diff. Depts and schools, (3) promotes formation of Internal res groups and assists with proposal development

Appendix C-3

Observed Trends and Analyses

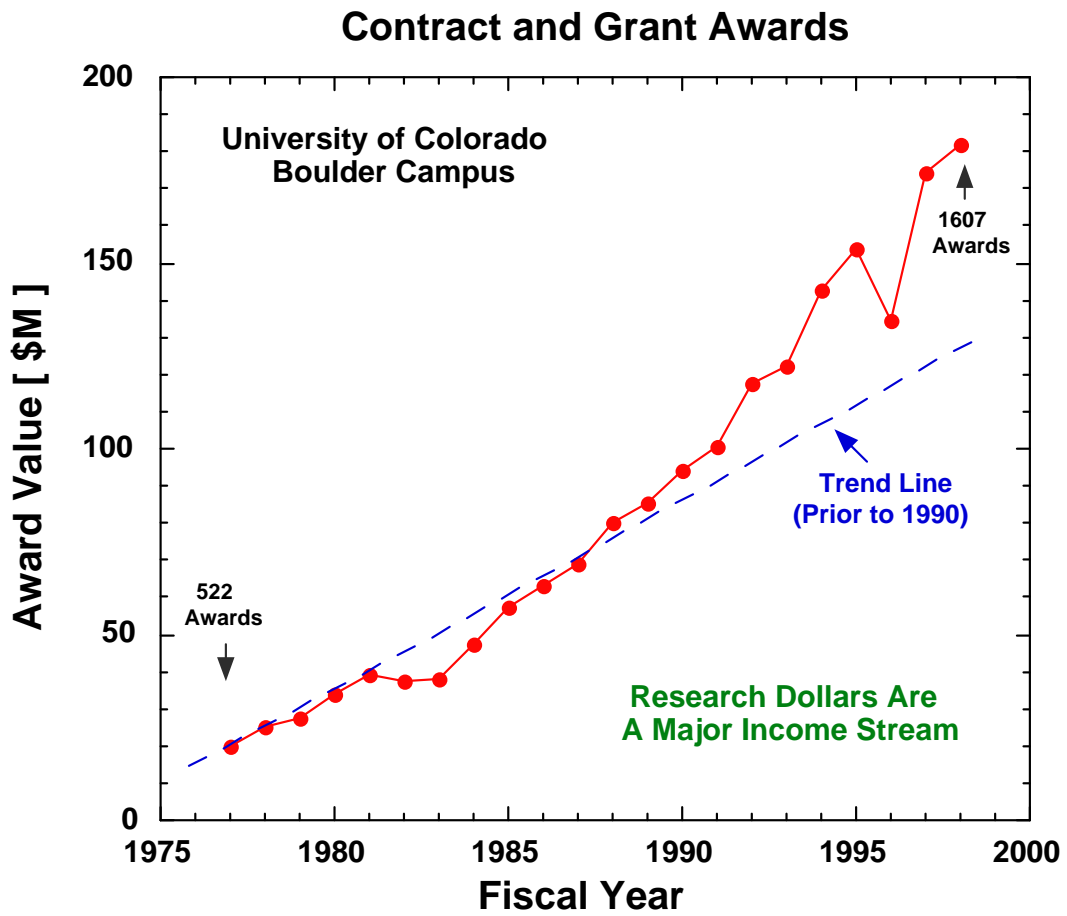


Table of Funding Awards for 1998-1999
Associated with Department and with Institutes

Name	Department Alone		Department + Faculty in Institutes	
Anthropology	(4)	62,224	(8)	137,642
Applied Mathematics	(17)	3,159,600	(22)	4,150,606
Astrophysical and Planetary Sciences	(60)	8,255,000	(120)	12,388,976
Center for Integrated Plasma Studies	(21)	1,382,625	(27)	1,524,784
Chemistry and Biochemistry	(108)	10,677,094	(153)	16,887,269
Classics	(3)	67,000	(3)	67,000
Communication	(2)	2,000	(3)	98,405
East Asian Languages and Civilization	(3)	161,934	(3)	161,934
Economics	(10)	330,871	(10)	330,871
English	(2)	71,136	(2)	71,136
Environ., Population and Organismic Biology	(37)	1,820,661	(51)	3,731,555
Geography	(8)	246,631	(33)	6,275,529
Geological Sciences	(29)	913,359	(83)	5,927,280
History	(1)	30,000	(1)	30,000
Kinesiology	(19)	2,141,760	(20)	2,362,811
Linguistics	(1)	20,000	(2)	108,000
Mathematics	(3)	51,128	(3)	51,128
Molecular, Cellular, Developmental Biology	(93)	11,662,716	(102)	12,567,631
Philosophy	0		(1)	3,422
Physics	(51)	6,228,540	(107)	14,411,251
Political Science	(1)	30,037	(3)	320,276
Program in Atmospheric and Oceanic Sciences	(25)	2,552,295	(51)	5,008,511
Psychology	(25)	3,045,364	(56)	9,997,916
Sociology	(8)	359,249	(14)	6,272,225
Speech, Language, and Hearing Sciences	(14)	1,956,938	(14)	1,956,938
Theatre and Dance	(1)	19,000	(1)	19,000

Funding for July, 1998-June, 1999
 Eng. Departments Alone and Departments + Associated Institutes
 Quantities in () are number of awards

Name	Department Alone		Department + Faculty in Institutes	
Aerospace Engineering	(129)	8,256,344	(143)	10,373,937
Chemical Engineering	(71)	4,129,516	(79)	5,021,090
Civil, Environ., and Architec. Engineering	(72)	5,392,464	(82)	6,857,433
Computer Science	(18)	3,595,818	(20)	3,953,973
Electrical Engineering	(66)	4,365,233	(74)	6,925,714
Mechanical Engineering	(37)	2,493,599	(46)	2,953,647
Interdisciplinary Telecommunications Program	(14)	491,725	(15)	551,905
Colorado Space Grant Consortium	(5)	822,616	(6)	873,319
College of Engineering Administration	(4)	412,000	(6)	422,000

Funding for July, 1998-June, 1999
 Graduate School and Research Institutes
 Quantities in () are number of awards

Name	Department Alone		Department + Faculty in Institutes	
Graduate School	(19)	1,276,977	(20)	1,291,927
Museum	(7)	155,246	(7)	155,246
Center for Limb Atmospheric Sounding	(6)	26,890,000	(6)	26,890,000
Cooperative Institute for Research in Environmental Sciences	(114)	29,356,782	(140)	58,050,360
Institute for Behavioral Genetics	(33)	6,355,575	(34)	6,585,333
Institute of Artic and Alpine Research	(69)	5,349,474	(72)	6,235,760
Institute of Behavioral Science	(15)	6,842,796	(15)	6,842,796
Institute of Cognitive Science	(7)	2,436,971	(17)	4,901,968
JILA	(68)	14,497,088	(74)	15,350,523
LASP	(124)	16,089,026	(148)	44,543,555