Research and Scholarship: Expenditures, Proposals, and Awards FY 1999

This report provides an assessment of the University's research efforts during the past fiscal year, as reflected by three major measures: (1) research expenditures, (2) research proposals, and (3) research awards. These data reflect the rich diversity of research activities and capabilities that have earned the University of Michigan the distinction of the nation's leading public research university.

Increases in annual expenditures in support of research demonstrate the continued leadership of the University in the discovery of new knowledge and in the application of leading-edge technologies for the benefit of society. Research expenditures in FY 1999 approached the $500 million mark, recording a 1.7% increase over the previous fiscal year.

Research proposals submitted provide some indication of the new research opportunities being offered by prospective sponsors and reflect the responsiveness of the faculty to these program opportunities. The majority of proposals are in response to specific requests for proposals—RFP's—which, in turn, reflect the highest priority research initiatives of the sponsors. The dollar value of the 3,329 proposals submitted in FY 1999 exceeded $1.8 billion.

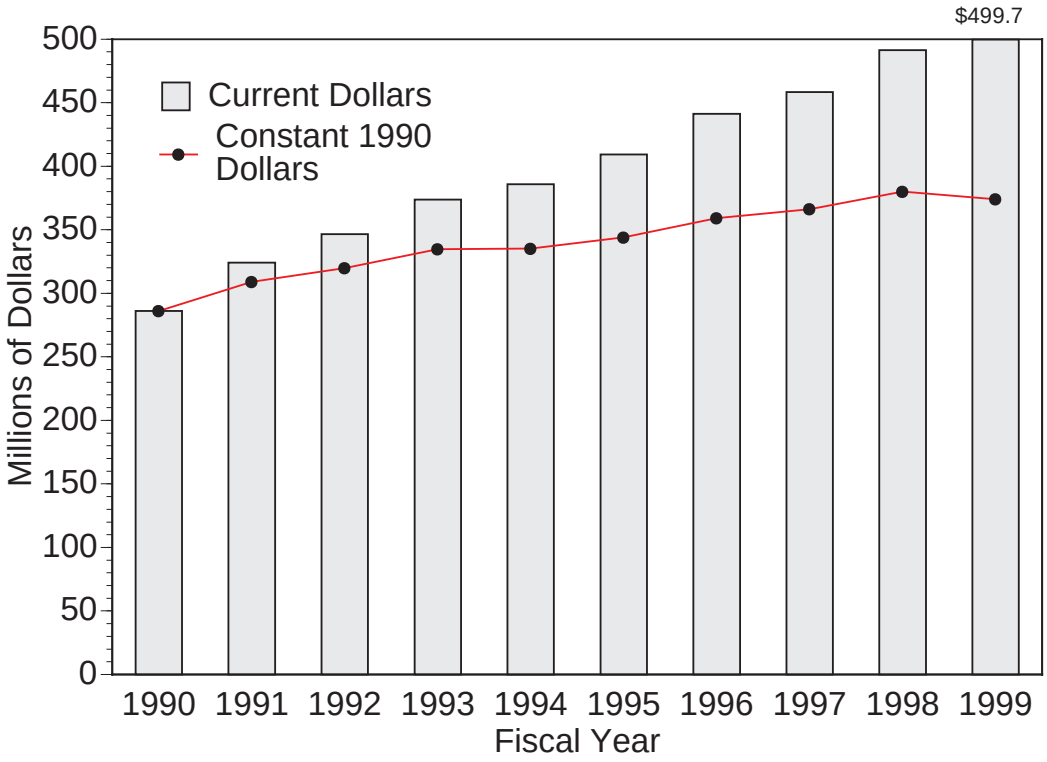
Ideally, new **research awards** should exceed annual expenditures in order for the University to sustain its research momentum in the face of increasing costs. In FY 1999, this "margin" between awards and expenditures is narrower than in previous years. Since many awards are made on a multi-year basis, a portion of the dollars awarded in any given year may be spent in subsequent years. Nonetheless, we will watch closely the awards activity in FY2000 looking for a rebound in new awards (a cycle we have witnessed before in the 1990s).

Research Expenditures: FY 1999

Total **research expenditures** at the University of Michigan have increased by 74.7% since FY 1990, from $286.1 million to $499.7 million, as shown in Exhibit 1. Real purchasing power of these expenditures (i.e., discounted for inflation) has also continued to increase. During this same time period, research expenditures increased by 30.8% in estimated constant (FY 1990) dollars. During the past fiscal year, total research expenditures increased by 1.7% in current dollars, from $491.5 million in FY 1998 to $499.7 million in FY 1999. The estimated constant dollar decrease during FY 1999 was 1.6%.

Indirect cost recoveries from externally funded research projects increased by 7.8%—from $99.0 million in FY 1998 to $106.5 million in FY 1999.

Exhibit 1
Research Expenditures FY 1990 - 1999



An estimated Research and Development Price Index was used to convert R&D expenditures to constant dollars.

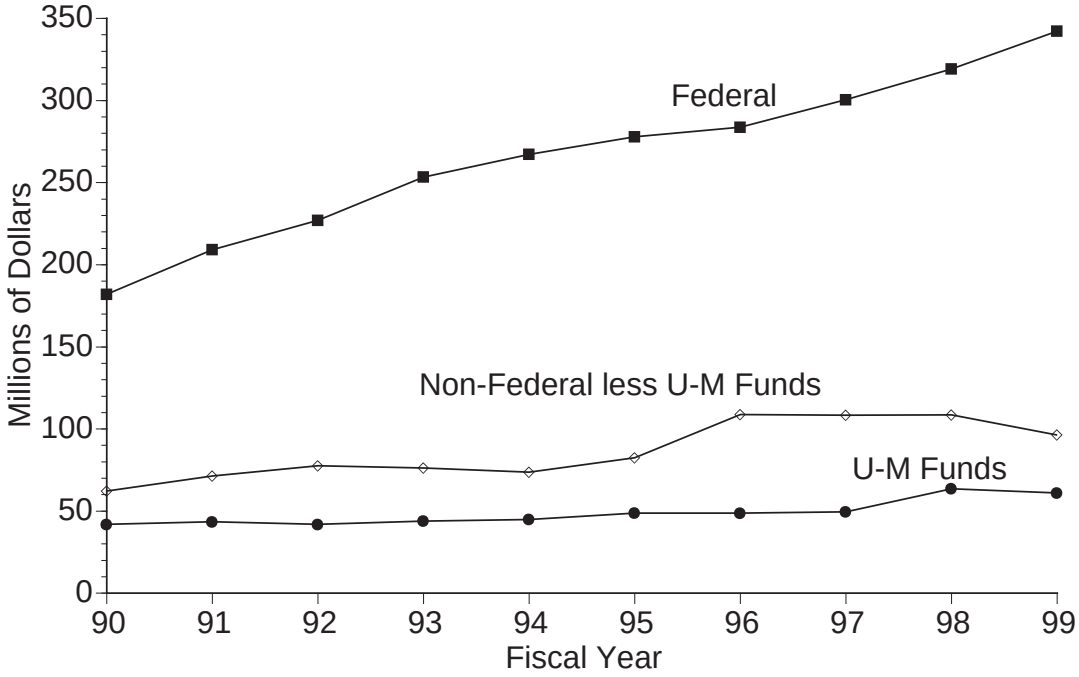
Federal projects accounted for 68.5% of the total research expenditures at the University of Michigan in FY 1999, up slightly from a 65.0% share in FY 1998. Since FY 1990, research expenditures from federal sources have increased by 88.1%, from $182.0 million to $342.2 million.

As shown in Exhibit 2, research expenditures from federally sponsored projects increased 15% in FY 1991--the largest increase at the University of Michigan in this period, both in relative and absolute terms. This growth trend continued through the 1990s. The 7.2% increase in research expenditures from federal sources in FY 1999 represents a modest improvement from the FY 1998 increase of 6.2% and further improvement over the FY 1997 increase of 5.9%.

Since FY 1990, research expenditures from non-federal sources have increased by 55.0%. A decline of 11.2% was recorded in the past fiscal year, from $108.6 million in FY 1998 to $96.4 million in FY 1999. Non-federal expenditures accounted for nearly 19.3% of the total research expenditures from all sources. Significant increases were recorded in support from public charities (14.0%), foundations (11.5%), and industry (5.1%). Significant decreases were noted in state and local governments (-34.4%), Trade and professional Associations (-32.7%), and other sponsors (-29.9%).

Increases in expenditures from federal sources over the past several years have tended to mirror the expenditure patterns of projects funded by the National Institutes of Health (NIH). Expenditures from NIH supported projects in FY 1999 increased by 7.9%. The overall increase in federal expenditures was 7.2%.

EXHIBIT 2
TREND IN RESEARCH EXPENDITURES
BY FEDERAL AND NON-FEDERAL SOURCES, FY 1990 - 1999

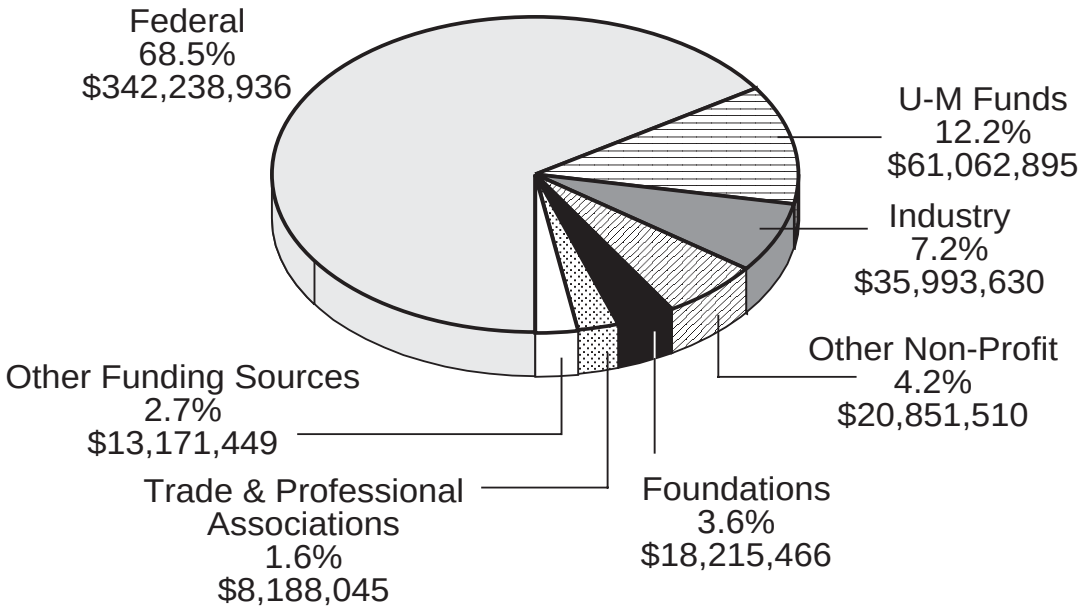


NIH accounted for 59.0% of the total federal expenditures in FY 1999 compared with 58.6% in FY 1998.

Expenditures from projects sponsored by the National Science Foundation increased by 5.7% in FY 1999. The increase in NSF support was offset somewhat by a 4.2% decline in expenditures from projects sponsored by the Department of Defense.

University funds in support of research accounted for $61.1 million (12.2%) of the $499.7 million in total research expenditures in FY 1999. These funds have been committed to meet critical capital facilities and equipment needs, as well as the increase in University cost sharing expectations on federal grants and contracts.

EXHIBIT 3
RESEARCH EXPENDITURES BY SPONSOR GROUP FY 1999

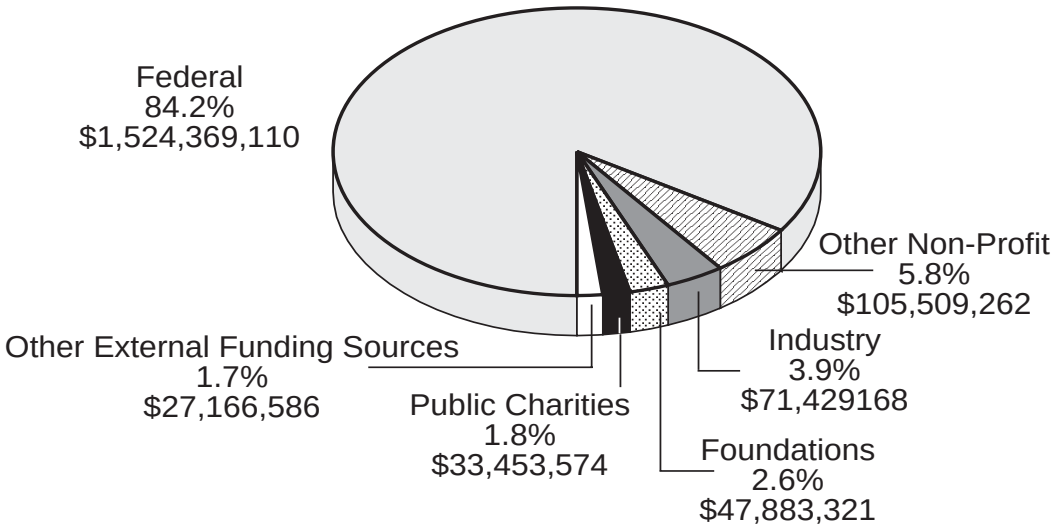


Total Research Expenditures $499,721,931

Research Proposals

The total dollar value of research proposals submitted by the University to prospective sponsors has increased by 59.1% since FY 1990, from $1.10 billion to $1.81 billion. The dollar value requested in FY 1999 represented a 16.1% increase over the $1.56 billion submitted in FY 1998. The dollar level of support requested of federal sponsors in FY 1999 grew by 19.3% to $1.52 billion, while the dollars requested of non-federal sponsors increased by 1.6% to $285.44 million. The distribution of proposals submitted in FY 1999 is shown in Exhibit 4.

Exhibit 4
Research Proposals by Sponsor Group FY 1999

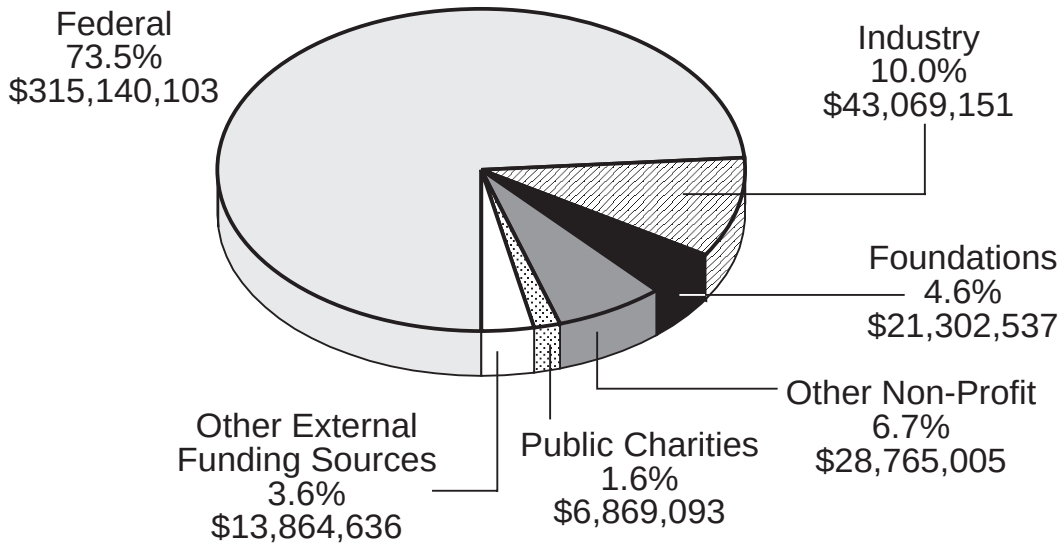


Total Research Proposals $1,809,811,021

Research Awards

The total dollar value of research awards recorded by the University since FY 1990 has increased by 14.2%, from $375.8 million to $429.0 million. The dollar value recorded in FY 1999 represented a 16.2% decrease over the $512.0 million recorded for FY 1998. The dollar level of support from the federal sponsors decreased by 15.9% to $315.1 million, while the dollars awarded by non-federal sponsors declined by 17.1% to $113.9 million. A modest increase in NIH, the largest sponsor of University research was realized at 1.3%. There were $1.1 million fewer awards made by NSF, the second largest sponsor of University research, in FY 1999 when compared with FY 1998.

Exhibit 5
Research Awards by Sponsor Group FY 1999



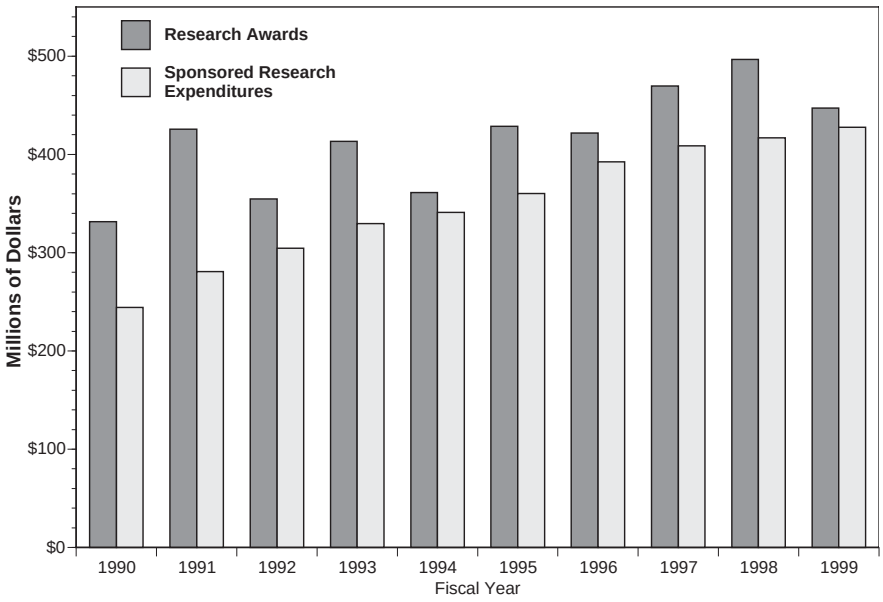
Total Research Awards $429,010,525

Research Awards and Expenditures from External Sources

The full amount of a research award is recorded in the year in which the notification is received. Often, these funds are expended over several years, however, making year-to-year comparisons between data on awards and expenditures somewhat misleading. A $10-million award from NIH for the period October, 1998 through September, 2003, for example, would be recorded in the fiscal year in which it was received—which might be FY 1998 or FY 1999. These funds, however, will be expended over the five-year period, but not necessarily in equal installments. The acquisition of equipment as part of the start-up period may result in a more significant portion of the funds being expended in FY 1999 than in other fiscal periods.

As shown in Exhibit 6, research expenditures from external sources have shown a steady upward trend since FY 1990, increasing from $244.2 million to $438.7 million. During this same period, research awards have exhibited, not

Exhibit 6
Comparison of Research Expenditures and Awards



unexpectedly, some "peaks" and "valleys." In FY 1999, the "margin" between awards and expenditures was relatively narrow, so we will be tracking closely the rate of new awards in FY2000, as a near-peak year will be important if the University is to maintain a steady source of research support.

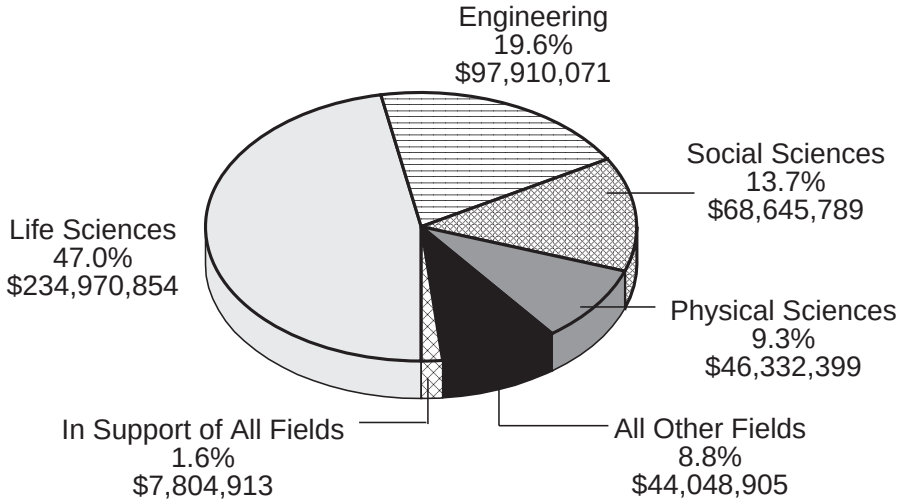
Research Portfolio by Field of Study

The distribution of research expenditures, awards, and proposals based on the six broad fields of study defined by the National Science Foundation provides another useful vantage point for understanding the University's research portfolio. These fields of study consolidate dollar values across organizational lines within the University. The field of Life Sciences, for example, includes some of the research activities in the Medical School, the College of Literature, Science, and the Arts, the School of Public Health, the School of Nursing, the College of Pharmacy, the School of Dentistry, the College of Engineering, and various research centers and institutes. The field of Engineering includes research activities in the College of Engineering, as well as projects some outside the College. The category, "All Other Fields", represents projects conducted by faculty in the Schools of Business Administration, Education, and Law, as well as the International Institute.

Several factors affect the distribution of research support among University units/disciplines: availability of external support in various fields, relative cost of undertaking research activities, size of the academic unit, relative emphasis placed on research, and national competitive position. Disciplines/units with greater access to federal agencies that provide multi-year awards will account for a larger percentage of the dollar value of awards when compared to their expenditures in any given fiscal year.

Collaborative efforts across unit boundaries further complicate an accurate reflection of this distribution. Faculty who have joint appointments tend to route their proposals through only one of their units (for example, the Institute for Social Research includes a large number of faculty with joint appointments in the College of Literature, Science and the Arts).

Exhibit 7
Research Expenditures by Field of Study FY 1999



Total Research Expenditures $499,712,931

Research expenditures in the Life Sciences increased by 5.0% in FY 1999, which was a contributing factor to the overall growth in research expenditures, since the Life Sciences account for 47.0% of the University's total research expenditures.

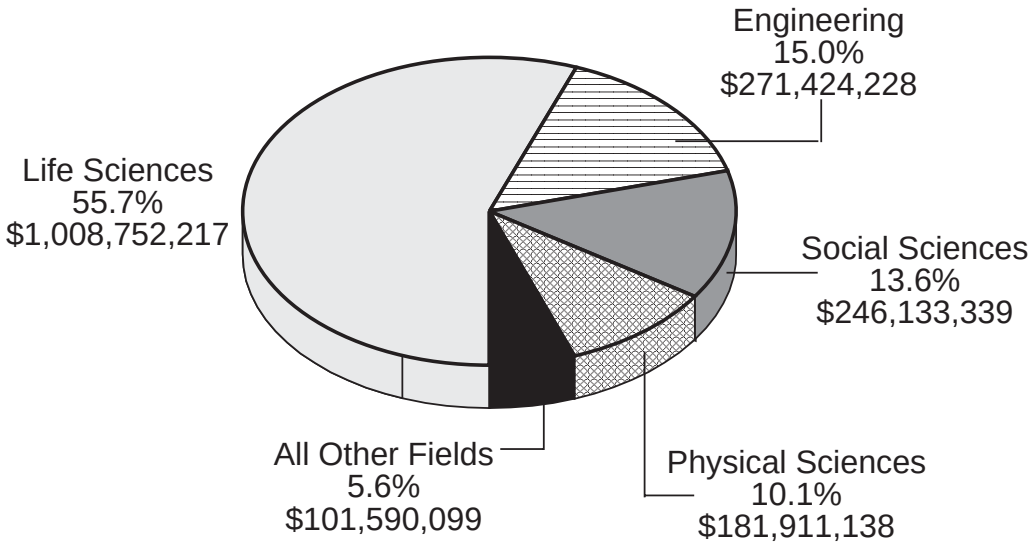
In the last year, research expenditures in the Engineering fields increased by 3.6%, from $94.4 million to $97.9 million. Expenditures in the Social Sciences increased by 12.7%, from $60.9 million to $68.6 million. Research expenditures increased in Physical Sciences by 2.2%. All Other Fields decreased by 2.3% between FY 1998 and 1999.

The distribution of research proposals submitted and awards recorded in FY 1999 are shown in Exhibits 8 and 9.

The FY 1999 dollar value of research proposals recorded for Life Sciences increased 26.0% over FY 1998. Engineering disciplines witnessed a decrease of 18.4% in the FY 1999 value of research proposals over FY 1998. An increase of 30.1% in dollar value of Social Science proposals was realized in the last fiscal year. The Physical Sciences experienced a decline of 20.3% in the dollar value of FY 1999 research proposals. There was also an increase of 43.2% in the dollar value of research proposals submitted by faculty in the category, "All Other Fields".

The dollar value of awards recorded by the Life Sciences areas decreased

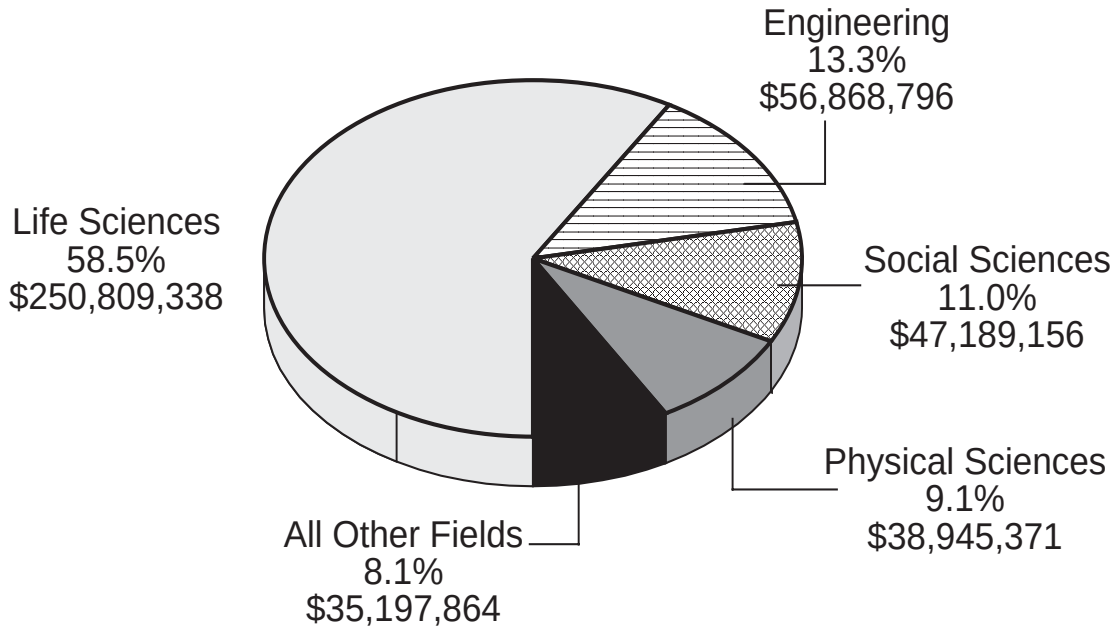
EXHIBIT 8
RESEARCH PROPOSALS BY FIELD OF STUDY FY 1999



Total Research Proposals $1,809,811,021

5.6%. The dollar value of awards recorded by the Engineering disciplines decreased by 51.7%. This decrease is primarily caused by an exceptional large multi-year award reported in FY 1998 for which there was no comparable award made in FY 1999. The Social Sciences showed a very modest 0.5% increase in award dollars. Physical Sciences recorded a 9.9% decrease over FY 1998's experience.

EXHIBIT 9
RESEARCH AWARDS BY UNIVERSITY UNIT FY 1999



Total Research Awards $429,010,525

Research Expenditures by Broad Fields of Study

A ten-year comparison of the distribution of research expenditures among different fields of study is provided in Exhibit 10. During this ten-year period, the University's research expenditures increased by 88.9%, from $264.5 million to $499.7 million, for an average increase of 8.9% per year.

The Life Sciences continue to maintain a dominant position in terms of the University's research expenditures, recording a 83.6% increase over the past ten years and accounting for $235.0 million (47.0%) of the total expenditures in FY 1999. However, the relative share of the total research dollars spent in support of the Life Sciences has declined slightly since FY 1989, when the $128.0 million represented 48.4% of the total expenditures.

Engineering accounted for 20.4% of the total research expenditures in FY 1989 ($54.0 million). Engineering has also declined slightly in University research expenditures compared to 10 years ago, to 19.6%, with $97.9 million in expenditures in FY 1999.

The Social Sciences continue to show an increased research capacity at the University of Michigan, accounting for 13.7% of the total research expenditures in FY 1999. The $68.6 million in expenditures represents a 138.7% increase over the $28.8 million expended in FY 1989.

Research expenditures in the Physical Sciences recorded a significant increase of 124.0% compared to 10 years ago, but has declined in share compared to five years ago. The $46.3 million spent in FY 1999 accounted for 9.3% of the total research expenditures.

EXHIBIT 10
TRENDS IN RESEARCH EXPENDITURES BY FIELDS OF STUDY

