Advanced Research Program - 1995

Advanced Technology Program - 1995

Report of Awards

April 1996

Texas Higher Education Coordinating Board
Division of Research, Planning, and Finance
P.O. Box 12788
Austin, Texas 78711
Texas Higher Education Coordinating Board

Leonard Rauch (Chairman)                      Houston
William C. Atkinson                        Bryan
Dolores Hutto Carruth, M.D.                Irving
Joaquin G. Cigarroa Jr., M.D.            Laredo
Robert I. Fernandez                         Fort Worth
Rene Haas                             Corpus Christi
Juan J. Hinojosa                               McAllen
Jodie L. Jiles                                Houston
Joseph R. Krier                            San Antonio
Steve Late                               Odessa
Wendy Marsh                              Amarillo
Janie S. McGarr                            Dallas
Andrew Melontree                              Tyler
Martha Miller                             Texarkana
Tom C. Nichols                             Lubbock
Ray E. Santos, M.D.                         Lubbock
Carlos Villa                              El Paso
Pamela P. Willeford                      Austin

COORDINATING BOARD MISSION

The mission of the Texas Higher Education Coordinating Board is to provide the Legislature advice and comprehensive planning capability for higher education, to coordinate the effective delivery of higher education, to administer programs efficiently and to improve higher education for the people of Texas.

COORDINATING BOARD PHILOSOPHY

The Texas Higher Education Coordinating Board will promote access to quality higher education across the state with the conviction that access without quality is mediocrity and that quality without access is unacceptable. The Board will be open, ethical, responsive, and committed to public service. The Board will approach its work with a sense or purpose and responsibility to the people of Texas and it committed to the best use of public monies.

Created by the Texas Legislature in 1965, the Texas Higher Education Coordinating Board works with institutions of higher education, other state agencies, the Legislature and the Governor to ensure that Texans seeking higher education have access to high quality programs. The Board's overall responsibilities include assessing the state of higher education in Texas, making recommendations to the Governor, Legislature and institutions for its enhancement, and establishing policies for the efficient and effective use of the state's higher education resources.
Table of Contents

Introduction .......................................................................................................................... 1
Role of the Advisory Committee on Research Programs .................................................. 2
Solicitation of Research Proposals ..................................................................................... 3
The Peer Review Process ..................................................................................................... 4
Outcomes of the 1995 Advanced Research and Advanced Technology Program
Reviews .............................................................................................................................. 5
Biennial Evaluations of the Advanced Research and Advanced
Technology Programs ....................................................................................................... 7
Acknowledgments ............................................................................................................... 7

Appendices
Appendix A: Affiliation of Review Panelists ................................................................. A-1
Appendix B: Proposals Submitted by Program Area ......................................................... B-1
Appendix C: List of Funded Proposals ............................................................................. C-1
Appendix D: Institutions Awarded Funds, 1995 ............................................................. D-1
Appendix F: Evaluation Forms ......................................................................................... F-1

List of Tables
Table 1: Advisory Committee on Research Programs, 1994-95 ..................................... 2
Table 2: Preliminary Allocations ....................................................................................... 3
Table 3: 1995 Review Panel Chairs ............................................................................... 4

List of Figures
Figure 1: Advanced Research Program 1995 Funding Allocation ................................... 6
Figure 2: Advanced Technology Program 1995 Funding Allocation ............................ 6
Figure 3: ATP Development and Transfer Grants 1995 Funding Allocation ............... 7
Advanced Research Program/Advanced Technology Program

Report of Awards

Introduction

In 1987, the 70th Texas Legislature created the Advanced Research Program (ARP) and the Advanced Technology Program (ATP) as complementary, statewide research programs providing peer-reviewed, competitive grants to Texas college and university researchers. Sixty million dollars were appropriated for the programs for the 1987-1988 biennium, and approximately the same amounts were appropriated for the programs for the four subsequent biennia.

The Advanced Research Program is devoted to basic research designed to attract and retain the best students and researchers and help provide the knowledge base needed for innovation. Researchers at all public institutions of higher education are eligible to compete.

The Advanced Technology Program is devoted to research with a technological objective and a long-term economic goal, but retains a strong educational component. It is designed to promote the state’s economic growth and diversification by increasing the number and quality of scientists and engineers, including minorities and women, in Texas; enlarging the technology base available to business and industry; creating new products and services; and attracting new industries to Texas. Researchers at all public and private institutions of higher education are eligible to compete.

In 1995, three types of proposals were considered:

1. **Advanced Research Program Proposals** to support basic research in 12 areas specified in statute.

2. **Advanced Technology Program Proposals** to support applied research in 12 areas specified in statute.

3. **Advanced Technology Program Development and Transfer Proposals** to continue the development and transfer to the private sector of technology created under previous Advanced Research Program or Advanced Technology Program grants.

A separate competition was held for each type of award.

The implementation strategy for the ARP/ATP features three key elements:
Policy guidelines and oversight are provided by the distinguished Texas scientists and engineers who are members of the Coordinating Board's Advisory Committee on Research Programs, (ACORP).

Proposals are solicited in 24 different research areas from faculty members in all institutions of higher education in the state; and

Proposals are peer reviewed by nationally prominent scientific and technological professionals, including industry representatives from Texas and throughout the nation.

This report outlines the procedures followed during the ARP/ATP 1995 proposal solicitation and review and describes the outcomes of the competitions.

Role of the Advisory Committee on Research Programs

The Coordinating Board's Advisory Committee on Research Programs provides direction and guidance to the programs and ensures their quality. Chaired by Dr. Norman Hackerman, it is composed of 12 eminent Texas scientists and engineers from academe and industry representing a wide range of disciplines (see Table 1). Currently four members of the National Academy of Science or the National Academy of Engineering serve on the committee.

The Committee consistently recommends that the Coordinating Board seek proposals from all possible sources within the Texas higher education system and select the very best of these through a fair and open process. ACORP reviews the program announcement, makes a preliminary allocation of funds among disciplines, and reviews the recommendations of the review panels.
Table 1

Advisory Committee on Research Programs, 1994-95
(Membership list through August 31, 1995)

Norman Hackerman (Chair) ................................................. President Emeritus, Rice University
Harry E. Bovay, Jr. .............................................................. President, Mid-South Telecommunications Company
J. Fred Bucy ................................................................. Dallas, Texas
Nancy Chang ............................................................ President and CEO, TANOX Biosystems, Inc.
Rinn Cleavelin .................................................. Technology Manager, Manufacturing Sciences and Technology Center, Texas Instruments, Inc.
Peter Flawn .............................................................. President Emeritus, The University of Texas at Austin
William Merrell ................................................ Vice Chancellor for Strategic Programs, Texas A&M University System
Max Navarro ............................................................... President, Operational Technologies Corporation
William B. Neaves ........................................ Dean, The University of Texas Southwestern Medical Center at Dallas
Dale K. Osborne .................................................. Professor, The University of Texas at Dallas
Billy E. Welch ................................................................. San Antonio, Texas
Vacant

Solicitation of Research Proposals

ACORP recommended the announcement of proposal solicitation and evaluation in April 1995. The proposal submission process, recruitment of reviewers, and the peer review process were reviewed.

ACORP approximated budget allocations for the targeted research areas (see Table 2). Exact allocations were to be based upon the quality of proposals within each area.

Table 2

Preliminary Allocations

<table>
<thead>
<tr>
<th>Advanced Research Program</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astronomy</td>
<td>$275,000</td>
</tr>
<tr>
<td>Atmospheric Sciences</td>
<td>225,000</td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>5,800,000</td>
</tr>
<tr>
<td>Chemistry</td>
<td>2,200,000</td>
</tr>
<tr>
<td>Computer Sciences</td>
<td>1,700,000</td>
</tr>
<tr>
<td>Earth Sciences</td>
<td>900,000</td>
</tr>
<tr>
<td>Engineering</td>
<td>3,500,000</td>
</tr>
<tr>
<td>Marine Sciences</td>
<td>700,000</td>
</tr>
<tr>
<td>Materials Science</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Mathematics</td>
<td>700,000</td>
</tr>
<tr>
<td>Physics</td>
<td>1,400,000</td>
</tr>
<tr>
<td>Social and Behavioral Sciences</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

Advanced Technology Program
<table>
<thead>
<tr>
<th>Field</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace</td>
<td>1,600,000</td>
</tr>
<tr>
<td>Agriculture and Aquaculture</td>
<td>4,500,000</td>
</tr>
<tr>
<td>Biomedicine</td>
<td>6,000,000</td>
</tr>
<tr>
<td>Biotechnology</td>
<td>5,000,000</td>
</tr>
<tr>
<td>Computer and Information Engineering</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Energy</td>
<td>3,500,000</td>
</tr>
<tr>
<td>Environmental Science and Engineering, Recycling and Water Resources</td>
<td>4,000,000</td>
</tr>
<tr>
<td>Manufacturing Technology</td>
<td>3,600,000</td>
</tr>
<tr>
<td>Marine Technology</td>
<td>800,000</td>
</tr>
<tr>
<td>Materials Technology</td>
<td>4,000,000</td>
</tr>
<tr>
<td>Microelectronics</td>
<td>2,500,000</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>1,300,000</td>
</tr>
</tbody>
</table>

The Coordinating Board adopted the proposed program announcement at its April 1995 meeting.

In spring 1995, the Coordinating Board staff conducted a series of 12 briefings at campuses throughout the state, as well as televised briefings transmitted to 16 additional campuses. More than 2,000 people attended these sessions. In addition, more than 6,000 copies of the program announcement were distributed to Texas institutions of higher education.

In June, the Board received 3,510 Notices of Intent to Submit a Proposal for the three programs. Each notice specified a particular program research area, project title and key words for a prospective proposal. These were used to estimate the number and specialties of individuals needed to serve as reviewers. Investigators at 52 Texas institutions submitted 3,085 proposals by the July 15 deadline.

**The Peer Review Process**

To review proposals, 152 experts were organized into 15 panels. The chairs (see Table 3) and most of the panelists were recommended by national professional or granting organizations. No panelists were associated with any Texas university. The majority were from outside Texas and had not served previously. Additionally, the number of reviewers from industry was increased since the last review cycle in 1993. A list of reviewer affiliations is provided in Appendix A.
Table 3

1995 Review Panel Chairs

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arden Bement</td>
<td>Distinguished Professor of Engineering, Purdue University</td>
</tr>
<tr>
<td>Judith Bond</td>
<td>Professor and Chair, Department of Biochemistry and Molecular Biology, University of Texas</td>
</tr>
<tr>
<td>George Dieter</td>
<td>Dean of Engineering Emeritus, University of Maryland</td>
</tr>
<tr>
<td>Gary Doolen</td>
<td>Senior Scientist, Los Alamos National Laboratory</td>
</tr>
<tr>
<td>Robert Hirsch</td>
<td>Consultant, Energy and Environmental Systems</td>
</tr>
<tr>
<td>John Hurrell</td>
<td>Vice President of Diagnostic Development, Genzyme Corporation</td>
</tr>
<tr>
<td>Richard Jones</td>
<td>Dean for Research, Institute of Food and Agricultural Sciences, University of Florida</td>
</tr>
<tr>
<td>John Long</td>
<td>Professor of Pharmacology, College of Medicine, University of Iowa</td>
</tr>
<tr>
<td>John Lowell</td>
<td>Senior Member, Technical Staff, Advanced Micro Devices</td>
</tr>
<tr>
<td>Willie May</td>
<td>Chief, Analytical Chemistry Division, National Institute of Standards and Technology</td>
</tr>
<tr>
<td>Jose Mendez</td>
<td>Professor of Economics, Arizona State University</td>
</tr>
<tr>
<td>Earl Pinkett</td>
<td>Manager, New Process Implementation and Compliance, General Electric Aircraft Engines</td>
</tr>
<tr>
<td>Stephen Rattien</td>
<td>Executive Director, Commission on Geosciences, Environment and Resources, National Academy</td>
</tr>
<tr>
<td>Gary Stein</td>
<td>Professor and Chairman, Department of Cell Biology, University of Massachusetts Medical Center</td>
</tr>
<tr>
<td>Robert White</td>
<td>Professor and Head, Department of Electrical and Computer Engineering, Carnegie Mellon University</td>
</tr>
</tbody>
</table>

The review criteria for the ARP proposals included the merit and soundness of the proposal; capability of the investigator(s) to perform the necessary research; adequacy of institutional commitment and resources; and potential positive effect on the infrastructure of science and engineering.

In addition to those criteria, the ATP proposals were evaluated on their prospects for commercialization, leveraging funds to attract external funds, technology transfer, and meaningful industrial collaboration.

Criteria for evaluating ATP Technology Development and Transfer proposals were the technical merit and soundness of the proposal, personnel and physical resources available to the project, and the technology transfer plan.

The proposal evaluation forms in Appendix F outline the evaluation criteria in more detail.

The Legislature mandates that no more than 70 percent of the funds be received by institutions in The University of Texas System and Texas A&M System. Adjustments were made by the Coordinating Board staff, using priorities established by the panels, to ensure that limit. The 27 highest ranked proposals from non-UT/A&M system institutions were added to the 389 identified by the review panels. The final allocations for the 416
proposals selected for funding were reviewed by ACORP.

In October 1995, the Advisory Committee on Research Programs recommended, based on the results of the peer review process, specific projects to the Coordinating Board for funding.

Outcomes of the 1995 Advanced Research and Advanced Technology Program Reviews

The $58,873,654 appropriated for these research grant programs, plus an additional $2,013,854 carried forward from the 1993 ARP/ATP awards, were distributed as recommended by the review panel chairs. A total of 416 proposals received funding -- 175 in the Advanced Research Program, 215 in the Advanced Technology Program, and 26 for the Advanced Technology Program Development and Transfer grants. The average award was approximately $145,000. Figures 1 through 3 illustrate the funding allocations for each program area. A listing of the specific projects, principal investigators, institutions and amounts awarded is found in Appendix C.
Biennial Evaluations of the Advanced Research and Advanced Technology Programs

The legislation creating the Advanced Research and Advanced Technology Programs specifies that the Coordinating Board appoint a committee consisting of representatives of higher education and private research organizations to evaluate the programs’ effectiveness every two years.

The program was last evaluated in fall 1994 by a committee appointed by Coordinating Board Chair Nancy Atlas. The committee reviewed documentation associated with the programs and met with representatives of the Lieutenant Governor and Speaker, project investigators, institutional administrators, reviewers, and representatives of the Advisory Committee on Research Programs (ACORP). Dr. Judson King, chair of the evaluation team and Vice Provost for Research in the University of California System, reported the committee’s findings to the Coordinating Board at its January 1995 meeting.

Acknowledgments

The Advisory Committee on Research Programs and Dr. Norman Hackerman, ACORP Chair, continue to make important and vital contributions to the success of these efforts. In addition, scientists and engineers at Texas higher education institutions ensure the quality of the program through the submission of more excellent proposals than can be funded.
Appendices

Appendix A - Affiliation of Review Panelists

Appendix B - Proposals Submitted by Program Area

Appendix C - List of Funded Proposals

Appendix D - Institutions Awarded Funds


Appendix F - Evaluation Forms
Related reports available:

Research Assessment Program, Final Report; October 1994

Research Enhancement Program--1994; Report of the 1994 Evaluation Committee

Research Needs of Texas State Agencies; September 1994

Research Expenditures September 1, 1993 - August 31, 1994; April 1995

For information about this program contact:

Dr. David W. Gardner
Texas Higher Education Coordinating Board
Division of Research, Planning, and Finance
P.O. Box 12788
Austin, Texas  78711
(512) 483-6150
Internet: gardnerdd@thecb.state.tx.us
The Texas Higher Education Coordinating Board does not discriminate on the basis of race, color, national origin, gender, religion, age or disability in employment or the provision of services.