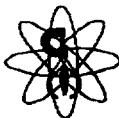


R603-92ER75833

ANNUAL REPORT 1991

DOE/ER/75833-T1



Science and Engineering Alliance, Inc.

AAMU^oJSU^oPVAM^oSUBROLLNL
JSU^oPVAM^oSUBROLLNL^oAAMU
PVAM^oSUBROLLNL^oAAMU^oJSU
SUBROLLNL^oAAMU^oJSU^oPVAM
LLNL^oAAMU^oJSU^oPVAM^oSUBR
AAMU^oJSU^oPVAM^oSUBROLLNL
JSU^oPVAM^oSUBROLLNL^oAAMU

February 21, 1992

Dear Mr. Chairman:

This Annual Report reviews SEA activities that occurred in 1991. I am particularly grateful to our member institutions (Alabama A&M University, Normal, AL -- Jackson State University, Jackson, MS -- Prairie View A&M University, Prairie View, TX -- Southern University and A&M College, Baton Rouge, LA) and the Lawrence Livermore National Laboratory (LLNL) for their participation in SEA programs through their service on committees and subcommittees and their presence at meetings and through their participation and presence at the first annual scholarship and incentives awards banquet.

For its support, the SEA depends largely on its membership contributions and gifts from corporations, foundations, government agencies through sponsored programs and friends. To the executive board, and all who contributed support, I extend a heartfelt thank you. Without such support, the SEA could not have had the success it experienced during its first year of operation.

Generally speaking, the future of science and technology in America and the world is filled with challenges. Some come from increased competitiveness in the world market place. Others from poor stewardship of the environment. Still others are the result of the natural aging process of infrastructure components such as roads, bridges, sewer systems and dams.

Particularly difficult is the ability to secure the funds needed for science and technology in a time when the economic condition is so unstable. Educational institutions struggle to balance how to deliver quality programs and services, keep aging facilities functional, and attract and retain high-quality teachers, students and other professionals in times when budgets are being cut to bare bones.

Relative to ethnic diversity, the future of minority participation in science and technology in America and the world at large is beset by its own challenges. Some come from the limited number of minority students from pre-college to graduate school in the science and engineering pipeline. Others are linked to the limited number of minority faculty and students that are pursuing science and engineering who, for the most

part, are not participating in high-quality, cutting edge scientific research endeavors. This is especially true of African-American faculty and students.

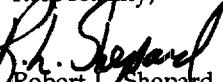
To address some of these challenges, the SEA will in 1992 -- its second year -- expand its activities to emphasize the importance of science to progress, especially progress within the minority community through a series of science programs. As national educational goals are being set that targets American educational achievement in science and mathematics by the year 2000, educational budgets are being cut, especially in the SEA region. These actions are coming at a time when employers are expressing concern that adequate numbers of technically trained personnel needed for the future workforce is dwindling as we rapidly move toward the 21st century.

The SEA recognizes the impact that these factors will have on our ability to address these challenges in 1992. Nevertheless, we are extremely confident that members and friends will continue supporting the SEA as it moves forward in its mission.

At the beginning of this year, I contacted supporters describing our strategy to enhance and expand the SEA programs. We are serious about our mission to increase the number of minority students in the educational pipeline from pre-college through undergraduate and graduate school. Likewise, we are equally determined to support teacher training through implementation of hands-on workshops and field exercises that expose teachers to innovative methods and techniques aimed at enhancing the teaching of science and mathematics. The SEA faculty and students currently engaged in science and engineering research will be given assistance to help them participate more fully in a wider-range of high-quality scientific research.

We are planning a full schedule of events for 1992. It is my hope that the technical and non-technical community will join our efforts. In closing, let me invite all who will be in Washington, D.C. in 1992, to visit our office on K Street (just two blocks from the White House) to discuss ideas focused on minority educational achievement in science and engineering now and into the next century.

Respectfully,


Robert L. Shepard
Executive Director

DISCLAIMER

Portions of this document may be illegible electronic image products. Images are produced from the best available original document.

TABLE OF CONTENTS

1991 HIGHLIGHTS

Changes within SEA.....	1
Summary of Executive Board Meetings.....	1
Historical Records.....	2
Planning and Policy Matters.....	2
Proposal Development.....	2
Other Initiatives.....	3

SEA PROGRAM ACTIVITIES

Pre-College.....	4
Research.....	5
Faculty and Student Development.....	5
Conference Activity.....	5
Scholarship Program.....	6
Summer Program.....	7
Infrastructure Development.....	7
Transaction Newsletter.....	8
Secretary-Treasurer's Report.....	8

APPENDIX

List of Contributors.....	10
---------------------------	----

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.



~~DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED~~

MASTER

1991 HIGHLIGHTS

Nineteen ninety-one was a busy and productive year for the Science and Engineering Alliance (SEA). This report covers the major programs and activities of the SEA during the fiscal year 1991 (the year ending September 30, 1991), which was the first year of operation. Where warranted, the report highlights some of the events from the last quarter of the calendar year.

The SEA is a non-profit consortium of four Historically Black Colleges and Universities (HBCUs). The SEA members are: (1) Alabama A&M University (Normal, Alabama); (2) Jackson State University (Jackson, Mississippi); (3) Prairie View A&M University (Prairie View, Texas); and (4) Southern University and A&M College (Baton Rouge, Louisiana).

The SEA's mission is to help increase the number of well-qualified minority scientists for the next century and beyond, and to provide input into the research and development needs of the nation. The SEA collaborates on research projects with government agencies, national laboratories, private foundations, industry and other universities in a broad range of technical areas.

This section of the report provides a brief highlight of the key SEA activities in 1991.

CHANGES WITHIN SEA

Significant changes occurred at three of the SEA institutions during the year. In April, President James A. Hefner left Jackson State University (JSU) to become President of Tennessee State University, and President Carl H. Marbury left Alabama A&M University (AAMU) to return to the college classroom to teach history at Stillman College. The third change involved Dr. Dolores R. Spikes stepping down as acting chancellor of Southern University and A&M College (SUBR), but remaining as president of the Southern University System. Drs. Hefner, Marbury, Spikes, and Julius W. Becton,

president of Prairie View A&M University (PVAM), were founding members of the SEA.

Dr. Herman B. Smith, Jr. was appointed interim president of JSU. Dr. Alan Keys was named interim president of AAMU, while Dr. Marvin Yates was named chancellor of SUBR (See back of report for other executive board members).



Dr. Dolores Spikes



Dr. James A. Hefner



Dr. Carl Harris Marbury



Gen. Julius W. Becton, Jr.

Founding members of the SEA.

SUMMARY OF EXECUTIVE BOARD MEETINGS

SEA held three executive board meetings in 1991. The first meeting was held on June 25, 1991 on the campus of AAMU. The second meeting was held on September 24, 1991 on the campus of SUBR. The third and final meeting convened on December 2, 1991, at the Marriott Hotel in New Orleans, LA, in conjunction with the annual meeting of the Southern Association of Colleges and Schools (SACS). Each meeting was chaired by Dr. Smith.

Representatives from each of the four member institutions and the one associate member institution, Lawrence Livermore National Laboratory (LLNL), attended all meetings. The meetings were held to discuss and inform the executive board of the major issues and day-to-day management activities of the SEA.

Historical Records

Since formal establishment of the SEA in 1990, organizing the SEA has been given high priority by the executive board. Therefore, the SEA Articles of Incorporation were drafted in early 1991 and were approved May 1991 by the State of Delaware. The By-Laws and 501 C.3 Tax Exempt Status progressed toward completion in 1991.

At the request of the executive board, the history, purpose, and founding premise of the SEA were combined into a single document in 1991. The historical perspective also included background on the involvement of LLNL with the SEA, particularly the purpose of the agreement signed between LLNL and the SEA.



Signing Ceremony with LLNL.

Planning and Policy Matters

In March 1991, a draft copy of a strategic five-year plan was completed. The Plan set out the goals, objectives and mission statement for the organization.

In December 1991, draft guidelines and policies were developed for: (1) selecting the lead

institution for SEA grants and contracts; (2) determining how grants and contracts would be taxed to support the SEA headquarters; and (3) establishing a technical advisory committee for the SEA.

At the December executive board meeting, LLNL, the associate member of the SEA, requested that the laboratory become a full member of the SEA because of its active involvement with the SEA. Toward the end of 1991, plans were made to include LLNL as the fifth member based on the technical resources that it provides to the growth and development of the SEA. A decision on whether to expand the SEA to include other historical black colleges and universities (HBCUs) who have expressed interest in joining the SEA was left unresolved. The executive board's tentative position was that enlarging the SEA beyond its current size may not be effective until a stronger organization has emerged around the existing five members. Once this goal is accomplished a meaningful criteria for expanding will be developed by the board.

Proposal Development

In 1991, the SEA developed and submitted four proposals to various Federal agencies and private groups requesting funding. The proposals included the following:

1. "High School Teacher Enhancement in the Sciences" – U.S. Department of Education's Funds for Improvement of Postsecondary Education (FIPSE);
2. "Pilot Program to Strengthen Science Education in Grades K-6" – National Science Foundation (NSF);
3. "Support of Pre-College Program and Infrastructure Development – U.S. Department of Energy (DOE); and
4. "Scholarship and Incentive Awards Program" – government, industry and individual support.

The SEA also joined partnership with a minority business on a NSF proposal aimed at producing a series of interactive video science programs for grades K-6 using minority scientists.

Other Initiatives

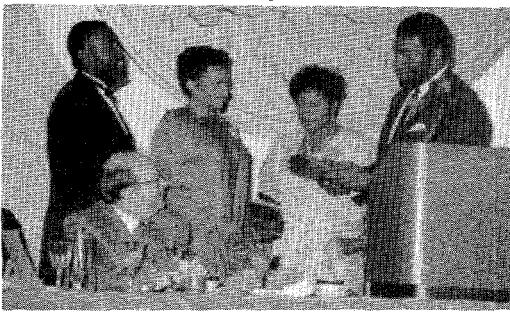
The following additional SEA activities were initiated in 1991:

1. Summer Program at LLNL for the enrichment of SEA faculty and students;
2. Newsletter entitled "TRANSACTION"; and
3. Scholarship program.

In addition to certificates being presented to the founding members in 1991, several other awards were given to individuals and organizations that assisted the SEA to meet its goals for the year. Dr. Hiawatha B. Fountain, associate superintendent for special and alternative education, Ms. Jennie Fleming, principal of Ronald McNair Elementary School, Ms. Sheila Jacobs, coordinator of the alternative school program at Richard Montgomery High School and Mr. Thomas Evans, Jr., school/community liaison representative for Mark Twain School, all part of the public school system in Maryland, were honored with special achievement awards for outstanding support of the education of minorities. SEA continues to develop partnerships with school districts in the Washington area.



Dr. Hiawatha Fountain, Montgomery County Public Schools (Maryland), receives award for minority education.



Shelia Jacobs, Richard Montgomery High School and Tom Evans, Mark Twain School, recognized for work with minority students.

Lucy H. McCorkle, chemistry teacher at Cardoza High School and recipient of the Presidential Awards for Excellence in Science and Mathematics Teaching program, was also honored with a special achievement award for outstanding support of minority education in the District of Columbia public schools.



Chemistry teacher Lucy McCorkle, Cardoza High School, Washington, D.C., receives award from SEA for being a recipient of the *Presidential Award for Excellence in Science and Mathematics Teaching*.



Certificates presented to SEA founding members.

SEA PROGRAM ACTIVITIES

This section provides greater details on SEA's four program areas.

PRE-COLLEGE

The SEA pre-college program got off to a good start in 1991. The U.S. Department of Education's Funds for the Improvement of Postsecondary Education (FIPSE) awarded the SEA a three-year grant for its proposal entitled "High School Teacher Enhancement in the Sciences". The proposal was one of the 85 selected for funding from among the 2000 plus proposals submitted to FIPSE.

The initial program involves high school teachers participating in a series of activities that include field studies and laboratory exercises (hands-on) aimed at improving the performance of the teachers of science and mathematics in high school. The program is structured so that teachers can become better acquainted and more comfortable with the subjects as recommended by the National Science Teachers Association (NSTA) and the National Council of Teachers of Mathematics (NCTM).

The overall objective is for teachers and administrators to gain an understanding of current deficiencies and/or fears in teaching science and mathematics, and develop field studies and laboratory exercises to stress content proficiency in science and mathematics curriculums and teaching strategies.

The program incorporates a combined total of eighty teachers per school year from high schools within the SEA region, and uses lead teachers and a team of expert evaluators to assure that goals and objectives for the program are being accomplished. The enrichment activities for the teachers include conference exposure and in-service training to ensure that the transfer is made from the workshops to the classroom. The SEA campus project leader will provide follow-up so that a network of interacting peers among the teachers will develop for the

purpose of sharing ideas and continuing the learning process.

The SEA pre-college (K-12) program is consistent with the mandates set forth in goals 3, 4 and 5 of the America 2000 Report. The program is directed toward systemic change (five years or more), and will involve not just teachers and students, but administrators, equipment and facilities as well.

The proposal entitled "Pilot Program to Strengthen Science Education in Grades K-6" is expected to add eighty elementary teachers to the ongoing teacher enhancement workshops. The SEA received a preliminary review of its proposal from the NSF in 1991, and steps are being taken to respond to comments from both the internal and external reviewers.

Two previous proposals submitted to the U.S. Department of Energy (DOE) prior to the official establishment of the SEA were withdrawn in 1991 so that a modified proposal could be resubmitted for consideration by DOE.

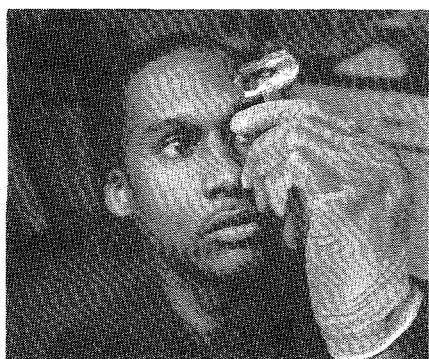
As a result of this action, DOE initiated in 1991 a three-year commitment to add to the FIPSE effort in support of the SEA's pre-college program, as well as, infrastructure development of the SEA Headquarters.

SEA joined partnership with CSY, Inc., a minority educational firm specializing in development of computer aided instructional material, to develop a series of interactive video science programs for grades K-6. If the project is funded, the video series will highlight some of the SEA science and engineering faculty and students.

A number of successful pre-college science enhancement programs for teachers are in place at the national and local levels. The uniqueness of the SEA's effort is its regional focus in an area (Southeast) where students' science and mathematics performance has been consistently and considerably lower than students in other regions of the country. A great need exist here.

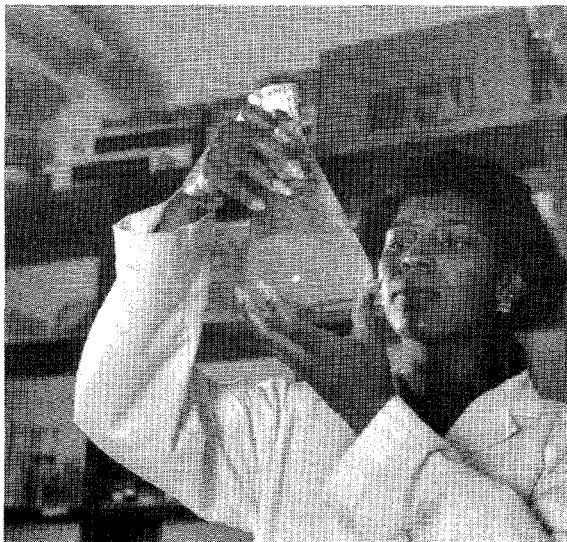
RESEARCH

The primary thrust of SEA's research activity in 1991 was to initiate collaborations in environmental research, especially projects to remove nitrogen, mercury, lead, phosphorus and heavy metals from wastewater/waste streams using algae and lime/carbon dioxide, then subsequent solidification and stabilization in cement. These projects are being incorporated into LLNL's environmental restoration program.



SEA students are active in undergraduate research.

In 1992, additional environmental projects will be established with other research organizations that are working to remove various organic contaminants from soil and from groundwater. Projects will be initiated in other technical areas relating to energy, material science, health and plant and soil science.



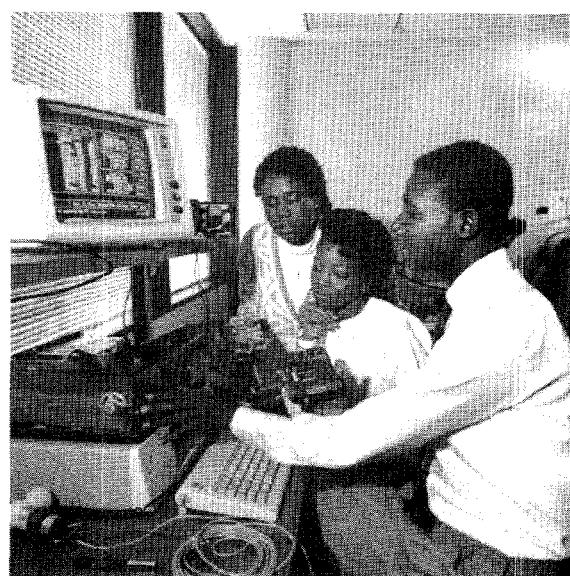
Students prepare for JSU/LBL/AGM conference in Puerto Rico.

FACULTY AND STUDENT DEVELOPMENT

Conference Activity

Four SEA students made oral presentations on their research at the Lawrence Berkeley Laboratory/Jackson State University/Ana G. Mendez Foundation science consortium's National Energy Research Conference (NERC) held September 23-28, 1991 in San Juan, Puerto Rico. The conference was held in conjunction with the Second Pan American Congress Energy and Chemistry for the Americas Conference. The conference theme was "Partnerships for Diversity in Energy Related Careers". The conference keynote addresses were given by Shirley McBay of Quality Education for Minorities Network (QEM) and Richard Stephens of DOE.

The student's presentations included "Flourescence in-situ: Hybridization as A Tool to Produce A Physical Chromosome Map"; "Phase Two of Remodeling the Thirty-inch Cassigrain Telescope" and "Synthesis and Characterization of Bulk and Thin Film Polymers." This activity provides students with opportunities to interact with professional experts in exchange and discussions that will continue to enhance their technical proficiency.



Student teams are the strength of SEA's undergraduate research activities.

The theme for the 1992 conference will be "Environmental Restoration and Waste Management in the 1990's". The student-centered conference will include five (5) students from the SEA making oral and poster presentations. The students will be involved in all aspects of the conference including serving as session chairs and discussion leaders. The conference is scheduled for April 9-11, 1992, in San Juan, Puerto Rico.

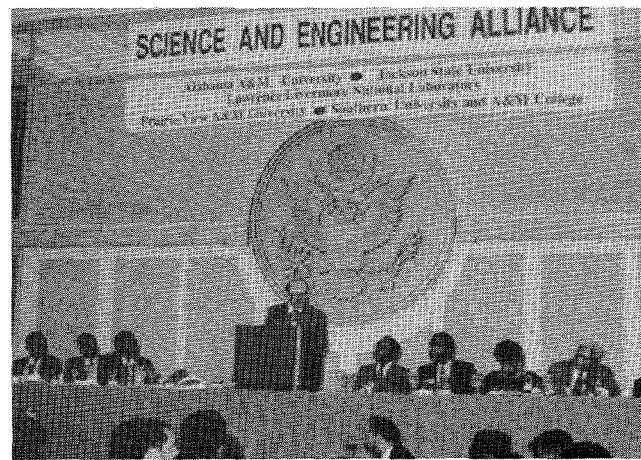
Scholarship Program

The first annual scholarship program was initiated in 1991 to help encourage minorities, especially African-Americans, to continue their pursuit of a career in science and engineering. Ten talented minority achievers received scholarships and incentive awards during a special banquet in recognition of their accomplishments. Scholarship recipients were Pamela Dickerson, a food science major and Patrice McDaniel a chemistry major, both at AAMU; Thaddeus Harrison a mathematics major at JSU; Dorkina Myrick a chemistry major at PVAM and Yolanda Griffin a computer science major at SUBR.



Scholarship recipients are designated "SEA Fellows".

The program theme was "Assuring America's Technological Future: If not Today, when....If not SEA, who....? The guest speaker for the event was Richard Stephens of DOE.



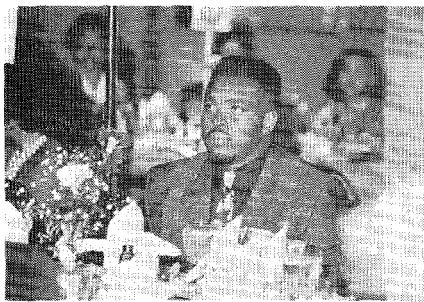
Richard Stephens, DOE, is keynote speaker at SEA's 1st awards banquet.

In addition to the scholarship awards, incentive awards were presented to five deserving high school seniors. They were Jennifer Williams, Hazlewood High School in Huntsville, Alabama; Eva Owens, Yazoo City High School in Yazoo City, Mississippi; Erika Brown, Waller High School in Waller, Texas; Gloria Thomas, Scotlandville Magnet High School in Baton Rouge, Louisiana, and Ranti Bushura, Cardoza Senior High School in Washington, D.C. These students are well-on their way to becoming tomorrow's scientists and engineers.



High school students from SEA region and Washington, D.C. honored for academic achievements in science and mathematics.

Of the students honored, only one was an African-American male. The SEA is placing special emphasis on increasing African-American male participation in science and engineering programs.



SEA develops strategies to increase African-American males in science and mathematics.

A major goal for 1992 is the establishment of an international linkage between African universities and the SEA. The linkage will provide assistance to African technological development by establishing closer ties among SEA faculty and research facilities and science faculty in Africa.

The international focus of the SEA was enhanced by the presence at the SEA banquet of the Nigerian Ambassador, His Excellency Malam Zubair Kazaure, and his Minister Kevin E.O. Efertei, and The Gambian Ambassador, His Excellency Ousman A. Sallah, and Omar Jalo, Minister of Agriculture.



Dr. Jeanette Jones, AAMU, discusses SEA international focus with Nigerian Ambassador and Minister.

The SEA alumni chapters played a key leadership role in making the first awards banquet successful. In 1992, SEA plans to gain additional support of the scholarship program so that it can continue to develop the diverse pool of talent that will provide tomorrow's scientists and engineers.

Summer Program

A summer program at LLNL was initiated in 1991. This program accommodates four research teams (each team consisting of one faculty and two students for a total of twelve participants) to work at LLNL in the areas of chemistry, physics, molecular biology, optics, material or environmental science.

The objective of the summer program is to assist faculty, especially junior faculty in their quest to initiate research programs. The first cadre of participants is scheduled to start the program in the summer of 1992.

INFRASTRUCTURE DEVELOPMENT

The SEA was supported by a number of organizations in 1991 as a result of its scholarship program. In addition to the tremendous support provided by LLNL, Monsanto Chemical Company contributed to development of the SEA infrastructure in 1991. Fred Thompson, Director of Total Quality for Monsanto presented a check to the SEA through Prairie View A&M University to support the scholarship program.



Fred Thompson, Monsanto Chemical Company, presents check to support SEA scholarship program.

It is our hope that in 1992, others will join LLNL, Houston Lighting & Power Company, Monsanto, Mississippi Power & Light Company, Entergy Operations, and the Fannie Mae Foundation in providing the SEA the support needed to help the nation make better use of its diverse pool of talent.

Plans were formulated in 1991 to install a first-class, modern, glass blowing facility at one of the SEA schools. This activity results from the availability of near-new equipment through LLNL that has been targeted for surplus. In addition to installing this facility, LLNL conducted seminars, taught courses, served on advisory committees and supported research at SEA schools through long-term loan of various pieces of equipment.

The SEA faculty and student summer program with LLNL incorporates a team concept as a means for improving the research infrastructure among SEA institutions. The goal is to develop laboratories at the schools around projects worked on during the summer at the national laboratory.

TRANSACTION NEWSLETTER

A method for communicating effectively with members and friends was implemented in 1991 through the introduction of the SEA newsletter "*TRANSACTION*". The newsletter is used to inform member institutions and the public of SEA's efforts to address the nation's technical manpower shortage

problem through greater participation by minorities, especially African-Americans. A major feature of the newsletter is the Research News section which highlights the research of a SEA faculty member.

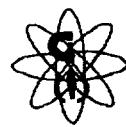
SECRETARY-TREASURER'S REPORT

The members provided ninety-six percent of SEA's operating support for 1991. The total revenue budget was \$303,000 which included income and scholarship funds. The expenses at year-end (December 20, 1991) totaled \$233,000, leaving the SEA with an operating surplus of \$70,000 in 1991.

During the year, the SEA implemented a computerized accounting system to quickly and accurately handle its financial obligations.

In 1992, the SEA expects to increase its revenue generating capacity through additional grants, contracts, and contributions from friends who view our mission as a worthy cause. All unrestricted funds will be used to enhance and expand SEA programs at the member schools and to support the operation of the SEA Headquarters.

In conclusion, the executive board and executive director of the Science and Engineering Alliance express appreciation to the members, who, through their contributions and volunteer services, have made possible the accomplishments of the SEA during 1991.



APPENDIX

List of Contributors

The Science and Engineering Alliance thanks its contributors for their support of its pre-college, research, faculty and student development, infrastructure development, and scholarship programs in 1991

\$50,000 and ABOVE

Lawrence Livermore National Laboratory
U.S. Department of Energy
U.S. Department of Education

\$25,000 to 49,999

Alabama A&M University
Jackson State University
Prairie View A&M University
Southern University and A&M College

\$10,000 to 24,999

Houston Lighting & Power Company

\$4,000 to 9,999

Monsanto Chemical Company

\$1,000 to 3,999

Mississippi Power & Light Company
Entergy Operations, Inc.
Fannie Mae Foundation
Winston & Strawn
SEA Alumni Chapters

\$100 to 999

Nigerian Embassy
CSY, Inc.
Howard University, Chemical Engineering Department
Howard University, Electrical Engineering Department
Joseph Hendrie Consulting

S. Levy Incorporated

Sam Pettijohn

Thelma J. Hill

<\$100

Verna M. Shepard

Doris J. Foster

Paul J. Ebert

Technical Consulting Group

Tim McCartin

W.E. Carter, Jr.

Dr. Olubunmi Abayomi

Lynn Elliott

Charles Cathey

James Stephen

Thurman Whitaker

Herman Graves, III

Adrienne B. Hatchett

James W. McAbee

Thomas & Barbara Ransom

Sheila Henley

Ralph B. Turner

Dr. Tepper L. Gill

Ras L. Smith

Benjamin Taylor, Jr.

Vernise Y. Steadman

SEA EXECUTIVE BOARD



Dr. Alan Keyes
Interim President
Alabama A&M University



Dr. Herman B. Smith, Jr.
Interim President
Jackson State University



General Julius Becton, Jr.
President
Prairie View A&M University



Dr. Philip E. Coyle, Jr.
Principal Laboratory Associate Director
Lawrence Livermore National Laboratory



Dr. Marvin Yates
Chancellor
Southern University & A&M College



Dr. Dolores R. Spikes
President
Southern University System



Dr. Robert L. Shepard
Executive Director
Science and Engineering Alliance