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FINAL REPORT
FOR
CENTER OF EXCELLENCE
IN
SCIENCE, ENGINEERING, AND MATHEMATICS

MOREHOUSE COLLEGE

Dr. Robert M. Dixon

ARO Grant Number – DAA 404-96-1-0006

September 30, 2002

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CONTENTS

| | Page |
|---------------------|------|
| I. Overview | 1 |
| II. Faculty Survey | 3 |
| III. Student Survey | 8 |
| IV. Summary | 21 |

Appendix

- A. Precollege Program
- B. The Scholars Program
- C. General Information

LIST OF TABLES

| Table | Page |
|------------------------------------------------------------|-------|
| I. Pipeline Program Faculty Mentors | 4 |
| II. Pipeline Program Teacher Mentors | 5 |
| III. Distribution of Mentors for Pipeline Program Students | 6 |
| IV. Mentors for Center Scholars | 7 |
| V. Pipeline Program Participants | 9-13 |
| VI. Center of Excellence Scholars | 15-16 |
| VII. Center of Excellence Non Scholarship Recipients | 19-20 |
| VIII. Objectives on Majors and Graduates in SEM Fields | 22 |
| IX. Information on Majors, Graduates, and Graduate School | 23 |

LIST OF CHARTS

| Chart | | Page |
|-------|-----------------------------------------|------|
| I. | Pipeline Grade Point Averages Histogram | 14 |
| II. | Scholars Grade Point Average Histogram | 17 |

I. OVERVIEW

This Final Report on the Center of Excellence in Science, Engineering and Mathematics at Morehouse College ends the formal grant period for the Center. It does not, however, end the effort on the part of the Center to support and encourage teaching, learning and research in the sciences, engineering, and mathematics. The Center which began formal operation in February 1996, has had significant impacts at Morehouse College and in the Atlanta Public Schools. The programs conducted by the Center influenced and improved the preparation of many high school students to pursue academic majors in the sciences, engineering, or mathematics. The Center also influenced and improved the preparation of many college students to pursue graduate studies in the sciences, engineering, or mathematics. In the Pipeline Program, all forty-nine of the participants graduated in May/June 2000 and entered College in the fall of 2000. Forty-eight of those students are now juniors with about 60 percent pursuing a major in science, engineering or mathematics. In May of 2000 thirty-three of the Center Scholars graduated from Morehouse. Two Center Scholars graduated early in the spring of 1999. The remaining seven Scholars graduated in either May of 2001 or May 2002. The percent of Scholars pursuing either graduate or professional studies is significantly higher than the College average.

The final Precollege summer program was conducted in 2000. We had twenty-four students in the summer Prefreshman Program, eleven high school teachers in the Workshop for High School Teachers and five high school teachers in the Research Experiences for High School Teachers Program. The workshop title was "Computer Based Learning for Mathematics and Science High School Teachers". The participants in the Research Program were involved in studies on elliptic curves and programming with C++. Information on the Precollege Program for the Summer of 2000 is found in the appendix and was previously shared in the Interim Report dated June 6, 2000.

The last Advisory Board Meeting was held February 23-24, 2000. The last on-site program review was conducted by the Army Research Office on April 20, 2000. Since these events we have kept Board Members well informed about activities and discussions to continue the Center. Formal communication with the Board had been shared with ARO. Board Members have been uniform in their praise of all Center programs. They have readily observed that in their collective experience they have not witnessed the kind of achievement attained by the students in our programs.

All students, Pipeline participants and Scholars, were recognized at their respective commencements with plaques from ARO and all Pipeline students with grade point averages of 4.00, and all Scholars received Palm III organizers.

During the initial five year period the Center served directly two hundred college students and seventy five high school students and fifty-five high school teachers. Indirectly these programs reached over three hundred students at Morehouse, several hundred high school students in Atlanta and close to one hundred teachers in the Atlanta Public Schools. Additionally, the Center has involved approximately seventy-five faculty members from all colleges and universities in the Atlanta University Center in its spectrum of programs. Without doubt, no grant program in the history of the College has had such broad and substantial influence over an extended period of time.

The Center has supported faculty and student research and involved all Scholars in meaningful summer research internships. The Center has established and demonstrated an effective mentoring model for maintaining high school students in the SEM pipeline. This is noteworthy and could prove useful to other program directors.

Since the summer of 2000 the Center staff worked to provide support to the seven engineering students who were scheduled to graduate in May of 2001. Four of these students graduated in May 2001 and the remaining three students graduated in May 2002. The Center has maintained an active weekly luncheon seminar program, which has exposed many students to outstanding scientists and engineers. The Center supported the mentoring program for the engineering students during 2000-2002 and other students who had participated in our summer program. The Center supported research and monitored the progress of former participants in colleges, and professional and graduate schools. The Center has also maintained an active relationship with science and mathematics teachers in the Atlanta Public Schools, and provided support when requested.

We are pleased with the achievements of all participants in the program. We have provided a base for the launching of many successful careers in SEM fields. Information on all participants presented in this report was current as of July 31, 2002.

Significantly, our accomplishments notwithstanding, we are in a fallow phase. Although we probably understand more about attracting and keeping students in SEM fields, we do not have a current cohort of students in Center programs. Nevertheless, we are sustained by the fact that we did provide an effective path for many minority students to pursue fields that probably would not have been open to them.

II. FACULTY SURVEY

A. Mentors

On May 31, 2000 the Pipeline Program ended. The faculty members from the Atlanta University Center (AUC) institutions who served as mentors to the Pipeline students were shown in the last report. They are shown here in Table I for completeness. In Table II we show the high school teachers who served as mentors to students in the Pipeline Program. This tandem approach to mentoring proved very effective. The teachers provided on-site or local mentoring while the faculty members provided what I termed global mentoring and role models. The distribution of Pipeline Program mentors from the AUC by institution, discipline and gender is shown in Table III.

In Table IV are the mentors for Scholars in May 2000. Those mentors with stars by their names continued to provide mentoring for the remaining engineering students during 2000-2001. Dr. Valerie Bennett became a mentor in the fall of 2000-2001.

B. Faculty

During the period of the grant we were able to recruit and bring on board two talented faculty members: Dr. Willie Rockward in experimental diffractive optics and Dr. Valerie Bennett in mechanical engineering. Both of these individuals have made substantial contributions to the program and both have established themselves as popular teachers. Their curricula vitae have been previously shared.

These faculty members have strengthened the ability of the Department of Physics to advise and teach the students who major in engineering. They have enhanced the potential of the Department for research in applied physics. In fact, both faculty members have attracted outside funding and both are involved in collaborations with major research universities: Dr. Bennett in nanostructures with Rensselaer Polytechnic Institute and Dr. Rockward in optical systems with biomedical/bioengineering applications with Northeastern University.

TABLE I. Pipeline Program AUC Faculty Mentors

Center of Excellence Pipeline College Mentors

| | | |
|-------------------------|--------------------------|------------------|
| Dr. Aakhut E. Bak | Morehouse College | Physics |
| Dr. Raymond Brown | Clark Atlanta University | Physics |
| Dr. David Collart | Clark Atlanta University | Biochemistry |
| Dr. Mosunmola Taylor | Clark Atlanta University | Biology |
| Dr. Karen Fulford | Morris Brown College | Biology |
| Mr. Fred Gibson | Morehouse College | Mathematics |
| Dr. Cornelia Gillyard | Spelman College | Chemistry |
| Dr. Nasreen Haque | Morehouse College | Physics |
| Dr. Rena Jones | Spelman College | Biology |
| Dr. Jo Ann Lee-Joyner | Spelman College | Chemistry |
| Dr. Shelia Anne McClure | Spelman College | Biology |
| Dr. Chung Wa Ng | Morehouse College | Computer Science |
| Dr. Yewande Olubummo | Spelman College | Mathematics |
| Dr. Willie Rockward | Morehouse College | Physics |
| Dr. Roosevelt Thedford | Clark Atlanta University | Chemistry |
| Mr. Charles Thompson | Clark Atlanta University | Computer Science |
| Dr. Ruth Trubmik | Morris Brown College | Mathematics |

TABLE II: Pipeline Teacher Mentors

**Center of Excellence
High School Teacher Mentors**

| <u>NAME</u> | <u>SCHOOL</u> | <u>SUBJECT</u> |
|-------------------------|------------------|----------------|
| Mr. Hasaan Ali | Southside HS | Mathematics |
| Mrs. Delphia Bryant | Grady HS | Physics |
| Mrs. Henra Davis | Therrell HS | Biology |
| Ms. Billie Hicks | Crim HS | Mathematics |
| Mrs. Willie Mae McCleod | Mays HS | Mathematics |
| Mrs. Joyce Mills | Douglass HS | Mathematics |
| Ms. Katheryne Mosley | Washington HS | Mathematics |
| Mrs. Anita Turner | Mays HS | Mathematics |
| Mrs. Katheryn Walker | North Atlanta HS | Mathematics |
| Dr. Virginia Williams | Mays HS | Mathematics |

TABLE III. Distribution of AUC Mentors for Pipeline Students

| Institution | Males | Females | Biology | Chemistry | Computer Science | Mathematics | Physics |
|--------------------------|----------|----------|----------|-----------|------------------|-------------|----------|
| Clark Atlanta University | 4 | 1 | 1 | 2 | 1 | 0 | 1 |
| Morehouse College | 4 | 1 | 0 | 0 | 1 | 1 | 3 |
| Morris Brown College | 0 | 2 | 1 | 0 | 0 | 1 | 0 |
| Spelman College | 0 | 5 | 2 | 2 | 0 | 1 | 0 |
| Total | 8 | 9 | 4 | 4 | 2 | 3 | 4 |

TABLE IV. Mentors for Center of Excellence Scholars

| <u>Name</u> | <u>Academic Discipline</u> |
|------------------------------|----------------------------|
| Dr. Segun Adeyemi | Engineering |
| *Dr. Aahkut E. Bak | Physics |
| Dr. Greg Battle | Mathematics |
| *Dr. Valerie Bennett | Engineering |
| Mr. Thomas Blocker | Biology |
| Dr. Robert Bozeman | Mathematics |
| Dr. Abdelkrim Brania | Mathematics |
| Dr. Virginetta Cannon | Biology |
| Dr. Curtis Clark | Mathematics |
| *Dr. Robert M. Dixon | Physics |
| Dr. J. K. Haynes | Biology |
| Dr. Arthur Jones | Computer Science |
| Dr. Joseph McCrary | Biology |
| Dr. M. P. McLoughlin | Mathematics |
| Dr. Chung W. Ng | Computer Science |
| Dr. M. North | Computer Science |
| Dr. Omalawa Amuleru-Marshall | Mathematics |
| Dr. Virgil Payne | Chemistry |
| Dr. Peng | Mathematics |
| *Dr. Willie Rockward | Physics |
| Dr. David Scott | Biology |
| * Mentors 2000 - 2002 | |

III. STUDENT SURVEY

The Pipeline Students who completed the program in May of 2000 and who are now third year College Students are shown in Table V. Also shown in this table are final high school grade point averages. As we previously pointed out, we had eleven students (22 percent) who graduated with a 4.00 grade point average. More than half of the Pipeline Students graduated with a cumulative grade point average above 3.50 and 92 percent of the students had above a 3.00. The final grades of the Pipeline students make a very positive statement about our model.

A summary of the data on academic performance of Pipeline students is displayed on the histogram on Chart I. The Colleges and Universities which the students are currently (Sept 2002) attending are also shown in Table V. Current College grade point averages for Pipeline Students are not available, but will be sought with the cooperation of the students in 2004. The scholarships and other awards received by the Pipeline students are presented in Appendix A.

In Table VI we show the Center of Excellence Scholars along with their respective majors and cumulative grade point averages (May 2000).

The academic performance of all Scholars, as of May 2000 is summarized in the histogram , Chart II.

The professional and graduate schools in which Scholars are currently enrolled are listed in Appendix B. Also shown are the fellowships, assistantships and other awards won by the Scholars.

TABLE V. PIPELINE PROGRAM PARTICIPANTS

| Name | Current Age | High School Attended | High School GPA | SEM Interest | Current University/College |
|------|-------------|----------------------|-----------------|-------------------|----------------------------|
| | 19 | North Atlanta HS | 4.280 | Civil Engineering | Georgia Tech |
| | 20 | Southside HS | 4.000 | Mathematics | Morris Brown College |
| | 19 | Therell HS | 3.452 | Mathematics | Hampton University* |
| | 20 | Crim HS | 3.910 | Mathematics | Emory University |
| | 20 | Southside HS | 3.452 | Architecture | Florida A & M Univ. |
| | 20 | Crim HS | 3.550 | Biology | Paine College |
| | 20 | Grady HS | 3.333 | Mathematics | Troy State University |
| | 19 | The Paideia School | 3.220 | Biology | Howard University |
| | 19 | Grady HS | 3.875 | Biology | Spelman College |
| | 19 | Douglass HS | 3.896 | Engineering | Mercer University |
| | 19 | Carver HS | 3.415 | Science | Morris Brown College |

TABLE V. (con't)
PIPELINE PROGRAM PARTICIPANTS

| Name | Current Age | High School Attended | High School GPA | SEM Interest | Current University/College |
|-------------|--------------------|-----------------------------|------------------------|---------------------|-----------------------------------|
| | 19 | Mays HS | 4.000 | Computer Science | Hampton University |
| | 19 | Douglass HS | 3.022 | Science | State Univ. f West GA |
| | 20 | Therell HS | 3.857 | Biology | Xavier Univ. of LA |
| | 20 | Grady HS | 3.771 | Elect. Engineering | Georgia Tech |
| | 20 | Douglas HS | 4.021 | Biology | NC A&T |
| | 20 | Crim HS | 3.450 | Biology | Georgia Perim. Coll. |
| | 20 | Mays HS | 2.865 | Biology | Georgia State Univ. |
| | 19 | Mays HS | 3.521 | Biology | State Univ. of West GA |
| | 19 | Therell HS | 4.048 | Science | Oxford Coll. Of Emory |
| | 19 | Southside HS | 3.420 | Physics | Georgia State Univ. |
| | 19 | Douglass HS | 2.915 | Engineering | GA Southern Polytech |

TABLE V. (con't)
PIPELINE PROGRAM PARTICIPANTS

| Name | Current Age | High School Attended | High School GPA | SEM Interest | Current University/College |
|------|-------------|----------------------|-----------------|------------------------|----------------------------|
| | 19 | Mays HS | 3.483 | Science | Morehouse College |
| | 19 | Mays HS | 3.558 | Science | W. Point Military Acad. |
| | 20 | Douglass HS | 3.378 | Mechanical Engineering | NC A&T |
| | 20 | Mays HS | 3.712 | Electrical Engineering | Georgia Tech |
| | 19 | Douglass HS | 3.277 | Physics | Morehouse College |
| | 19 | Grady HS | 3.229 | Computer Science | Morehouse College |
| | 19 | Washington HS | 3.690 | Science | Fort Valley State Univ. |
| | 19 | Salem Academy (NC) | 3.052 | Physics/Engineering | Georgia State Univ. |
| | 19 | Mays HS | 4.173 | Biology | Emory University |
| | 19 | Mays HS | 4.096 | Architecture | NC A&T |
| | 20 | Douglass HS | 4.125 | Computer Engineering | Morehouse College |

TABLE V. (con't)
PIPELINE PROGRAM PARTICIPANTS

| Name | Current Age | High School Attended | High School GPA | SEM Interest | Current University/College |
|------|-------------|----------------------|-----------------|----------------------|----------------------------|
| | 20 | Douglass HS | 3.596 | Biology | Florida A&M Univ. |
| | 19 | Westlake HS | 2.810 | Mathematics | Florida A7M Univ. |
| | 19 | Mays HS | 4.000 | Biology | Cornell University |
| | 20 | Douglass HS | 4.022 | Chemistry | Florida A&M Univ. |
| | 19 | Stephenson HS | 3.480 | Mathematics | Miles College |
| | 19 | Mays HS | 3.231 | Computer Engineering | Florida A&M Univ. |
| | 18 | Mays HS | 3.490 | Chemical Engineering | Florida A&M Univ. |
| | 18 | St. Pius X HS | 3.510 | Biology | Duke University |
| | 20 | Mays HS | 3.577 | Engineering | Univ. of Tennessee |
| | 19 | North Atlanta HS | 3.890 | Computer Programming | Emory University |
| | 18 | Washington HS | 3.740 | Biology | Agnes Scott College |

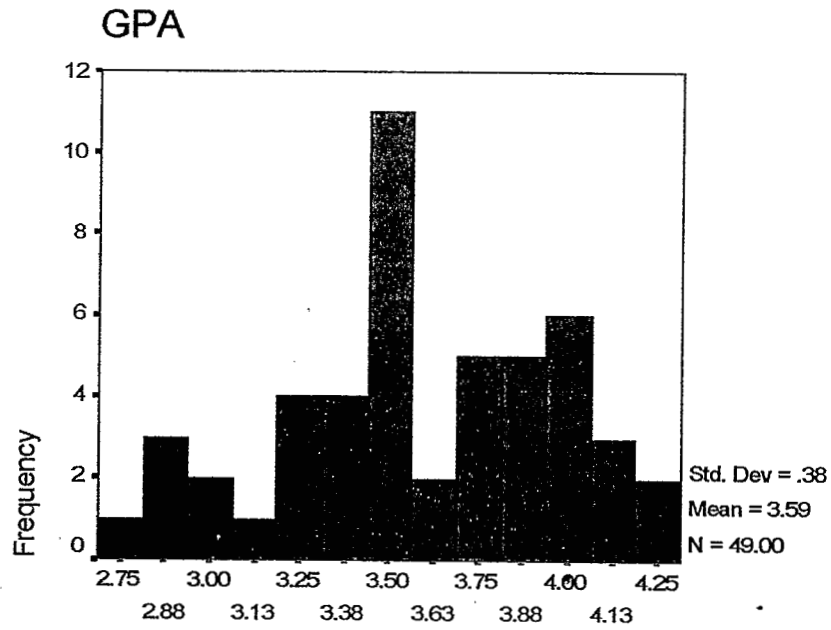
TABLE V. (con't)
PIPELINE PROGRAM PARTICIPANTS

| Name | Current Age | High School Attended | High School GPA | SEM Interest | Current University/College |
|-------------|--------------------|-----------------------------|------------------------|---------------------------|-----------------------------------|
| | 19 | Mays HS | 2.885 | Archeological Engineering | Albany State Univ. |
| | 19 | Grady HS | 3.125 | Biology | GA Southern |
| | 19 | Mays HS | 3.769 | Science | Georgia Tech |
| | 19 | North Atlanta HS | 3.460 | Biology/Pre Med | Univ. of Notre Dame |
| | 20 | Douglass HS | 4.213 | Biology | Spelman College |

CHART I

PIPELINE GRADE POINT AVERAGES

SPRING 2000



GPA

TABLE VI. Center of Excellence Scholarship Recipients

| <u>Name</u> | <u>Major</u> | <u>Cumulative GPA</u> |
|-------------|------------------|-----------------------|
| | Computer Science | 3.88 |
| | Engineering | 3.76 |
| | Biology | 3.60 |
| | Mathematics | 3.12 |
| | Engineering | 3.75 |
| | Engineering | 2.51 |
| | Physics | 2.96 |
| | Computer Science | 3.14 |
| | Physics | 3.29 |
| | Chemistry | 2.93 |
| | Chemistry | 3.67 |
| | Biology | 3.48 |
| | Computer Science | 3.44 |
| | Physics | 2.90 |
| | Mathematics | 3.10 |
| | Computer Science | 3.09 |
| | Computer Science | 3.29 |
| | Chemistry | 3.01 |
| | Chemistry | 3.07 |
| | Biology | 3.17 |
| | Biology | 3.27 |
| | Chemistry | 3.21 |
| | Biology | 3.62 |
| | Mathematics | 3.29 |
| | Computer Science | 3.05 |
| | Biology | 3.45 |
| | Physics | 2.88 |
| | Engineering | 3.10 |
| | Engineering | 3.05 |
| | Engineering | 3.00 |
| | Chemistry | 3.01 |
| | Engineering | 3.01 |
| | Biology | 3.54 |
| | Physics | 3.18 |
| | Computer Science | 2.96 |
| | Computer Science | 3.34 |
| | Mathematics | 3.11 |
| | Biology | 3.32 |

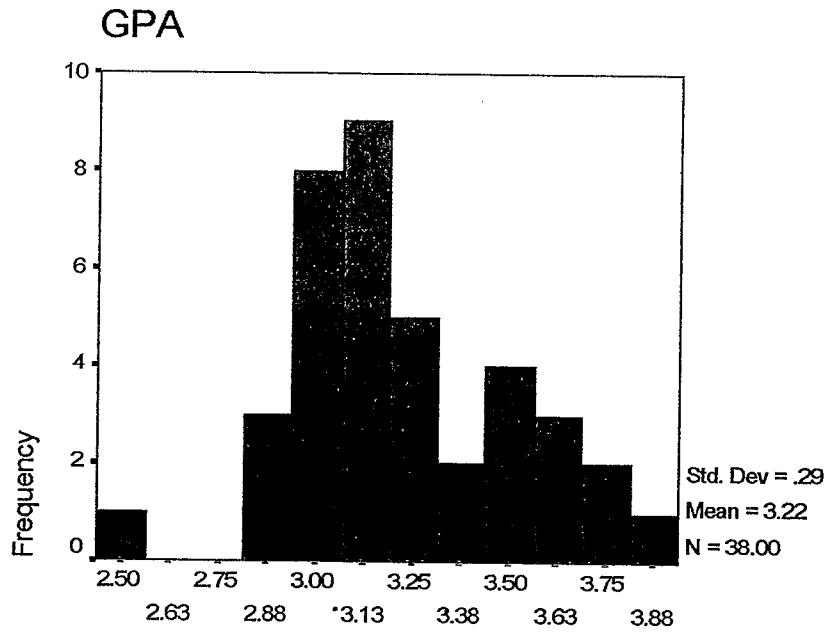
**TABLE VI CENTER OF EXCELLENCE SCHOLARSHIP RECIPIENTS
(continued)**

| <u>Name</u> | <u>Major</u> | <u>Cumulative GPA</u> |
|-------------|------------------|-----------------------|
| | Computer Science | 3.33 |
| | Mathematics | 3.22 |
| | Mathematics | 2.86 |
| | Physics | 3.75 |

CHART II

SCHOLARS GRADE POINT AVERAGES

SPRING 2000



In cases where a student has completed the M.S. degree we provide the information.

As we previously indicated in the report submitted on June 30, 2000, we have learned how we might have improved the program. The strategies for improvement are listed:

1. A presophomore summer program in mathematics and science
2. More meetings of the Center staff and all mentors
3. More formal communication about student research (symposia, seminars, a student managed research conference)

These strategies would result in the Scholars spending more time in formal Center sponsored activities. One of the recommendations made by the Board at the last advisory Board Meeting was that future programs for the college students should have more structure and parallel those for the Pipeline Program.

In Table VII we show Center Scholars who were not supported by Center of Excellence Scholarships.

TABLE VII. CENTER OF EXCELLENCE NON-SCHOLARSHIP RECIPIENTS

| <u>Name</u> | <u>Major</u> |
|-------------|------------------------------|
| | Chemistry/Engineering |
| | Mathematics/Engineering |
| | Computer Science |
| | Biology |
| | Physics |
| | Mathematics |
| | Mathematics |
| | Computer Science |
| | Biology |
| | Computer Science |
| | Mathematics/Engineering |
| | Computer Engineering |
| | Computer Science/Engineering |
| | Computer Science |
| | Computer Science/Engineering |
| | Biology |
| | Computer Science |
| | Engineering |
| | Computer Science |
| | Mathematics |
| | Biology |
| | Computer Science/Mathematics |
| | Biology |
| | Mathematics |
| | Physics |
| | Engineering |
| | Biology |
| | Biology/Engineering |
| | Physics |
| | Mathematics |
| | Mathematics/Engineering |
| | Computer Science |
| | Engineering/Mathematics |
| | Computer Science |
| | Computer Science |
| | Computer Science/Engineering |
| | Applied Physics |

**TABLE VII. CENTER OF EXCELLENCE NON-SCHOLARSHIP RECIPIENTS
(continued)**

Name

Major

Chemistry/Engineering
 Mathematics/Engineering
 Computer Science
 Physics/Engineering
 Engineering
 Computer Science/Engineering
 Physics
 Computer Science/Engineering
 Computer Science
 Biology
 Mathematics/Engineering
 Chemistry
 Biology
 Computer Science
 Chemistry/Engineering
 Engineering
 Computer Science
 Mathematics
 Mathematics
 Physics/Engineering
 Physics/Engineering
 Mathematics/Engineering

IV. SUMMARY

Although we previously provided an assessment of the program against the apriori established benchmarks, we were unable to include engineering graduates. We now include that information.

The Center of Excellence in Science, Engineering, and Mathematics was established to increase the number of underrepresented minorities pursuing careers in science, engineering, and mathematics (SEM). Objectives were established for the number of graduates, and the percent of graduates attending graduate school in chemistry, computer science, engineering, mathematics, and physics. Objectives were established for retention in the Pipeline Program and for the percent of participants who would attend college and major in one of the SEM fields. The objectives on majors and graduates as set forth in the initial proposal are shown in Table VIII.

In Table IX the numerical data on departmental program majors, graduates, and percent of graduates attending graduate school are shown for the period 1998-2000.

Although we met the objective of 40 graduates in biology in May 1998, we were not able to sustain this number for subsequent years. The percent of graduates in biology attending graduate school showed fluctuation during the grant period and did not reach our objective of 40 percent. Consistently, 50 percent or more of the graduates in biology attend professional school in medicine or dentistry. In chemistry the objective for the number of graduates in 1998 was also met; however, the number of students attending graduate school was not met. In subsequent years the number of students attending graduate school did not meet the target objective in chemistry. In computer science the objective on the number graduates was not met in 1998, but was achieved in May 2001. The percent of graduates in computer science attending graduate school has fluctuated about 20 percent which is 20 percent less than the target objective. In mathematics we have consistently met the objective on the number of graduates. In fact, we have been above the target of twenty graduates for the last five years. In mathematics we have achieved an average of 40 percent of the graduates attending graduate school for the last three years. This number is 10 percent less than the target.

In engineering and physics we have not met our objectives for the number of graduates. Although the percent of graduates in physics attending graduate school remains high, above 75 percent, the number of graduates has been less than projected. In May of 2000 we had eight graduates and seven entered graduate school. This meant that the objective for the number of graduates attending graduate school was met although we were 47 percent below the number of graduates we had aimed to produce. The number of graduates in engineering has consistently been above twenty which means that our dual degree engineering program is a significant producer of African American males in engineering.

TABLE VIII

OBJECTIVES ON MAJORS AND GRADUATES IN SEM FIELDS

| Discipline | Majors | Graduates | Graduates who Attend Graduate School |
|-------------------------|-------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Biology | From an annual average of 375 to 400 by January 1998 | Forty (40) for May 1998 and to maintain this number as an average | At least 40 percent per year and to maintain this number as an average |
| Chemistry | From an annual average of 50 to 60 by January 1998 | Fifteen (15) for May 1998 and to maintain this number as an average | At least seven (7) students per year by May 1998 and maintain this number |
| Computer Science | From an annual average of 250 to 270* by January 1998 | Twenty-five (25) by May 1998 and to maintain this number as an average | At least forty (40) percent per year and to maintain this number as an average |
| Engineering | From an annual average of 300 to 325 by January 1998 | Thirty (30) for May 1998 and to maintain this number as an average | At least forty (40) percent per year and to maintain this number as an average |
| Mathematics | From an annual average of 90 to 100 by January 1998 | Twenty (20) for May 1998 and to maintain this number as an average | At least fifty (50) percent per year and to maintain this number as an average |
| Physics | From an annual average of 50 to 60 by January 1998 | Fifteen (15) for May 1998 and to maintain this number as an average | At least seven (7) students per year by May 1998 and to maintain this number as an average |

Table IX. Information on Majors, Graduates, and Graduate School

1998-2000

| Discipline | Majors | | | Graduates | | | % of Grads Attending Grad School | | |
|------------------|-----------|-----------|-----------|-----------|----------|----------|----------------------------------|----------|----------|
| | Jan. 1998 | Jan. 1999 | Jan. 2000 | May 1998 | May 1999 | May 2000 | May 1998 | May 1999 | May 2000 |
| Biology | 404 | 395 | 400 | 40 | 39 | 29 | 27 | 21 | 28 |
| Chemistry | 96 | 88 | 85 | 19 | 17 | 10 | 21 | 47 | 50 |
| Computer Science | 211 | 217 | 225 | 17 | 16 | 24 | 12 | 19 | 20 |
| Engineering | 378 | 380 | 389 | 20 | 25 | 23 | 20 | 25 | 35 |
| Mathematics | 85 | 91 | 93 | 22 | 28 | 23 | 29 | 30 | 40 |
| Physics | 61 | 62 | 62 | 5 | 4 | 8 | 80 | 75 | 88 |

Although our very ambitious objectives for the scholars were not completely met, the achievements of the Center are without parallel. In terms of African American male graduates in the SEM fields, we have no peer. The Center of Excellence has far exceeded all prior science and mathematics education programs at Morehouse. The Center has, through its many successes and contributions to Morehouse, AUC, Atlanta and higher education in general, exceeded the suggested impacts found in the initial request for proposals. The Center has much to teach others who would attempt this kind of endeavor

Appendix A: Pipeline Program

**Scholarships and Awards
for
Pipeline Students**

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|------|-------------------------------------------------------|---------|
| | HOPE Scholarship | 12 000 |
| | Georgia Institute of Technology - Pell Grant | 14 400 |
| | Georgia Tech Run-For-It Scholarship | 8 000 |
| | Black Coalition for Women of Atlanta Book Scholarship | 3 200 |
| | University of Michigan Scholar | 20 000 |
| | Gates Millennium Scholarship | 5 500 |
| | HOPE Scholarship | 12 000 |
| | Atlanta Technical Institute - HOPE Scholarship | 4 416 |
| | HOPE Scholarship | 12 000 |
| | Alcorn State University | 22 456 |
| | Fisk University | N/A |
| | Morehouse College | N/A |
| | Morgan State University | N/A |
| | Omega Psi Phi Fraternity, Inc. | 200* |
| | Eta Omega Chapter Book Scholarship | |
| | Stillman College | 16 000 |
| | Valdosta State University | N/A |
| | Hampton University | 60 336 |
| | Alpha Phi Alpha Fraternity | 1 000* |
| | Emory University | 129 600 |
| | MLK Scholarship | |
| | HOPE Scholarship | 12 000 |
| | Omega Psi Phi Fraternity | 250* |

N/A : student was accepted but received no scholarship from school

* Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| College/University/ Scholarship Foundation | Amount |
|-----------------------------------------------|--------|
| HOPE Scholarship | 12 000 |
| Paine College | 12 000 |
| St. Andrew's College | 56 000 |
| Mercer University | 14 000 |
| HOPE Scholarship | 12 000 |
| HOPE Scholarship | 12 000 |
| Troy State University | 96 000 |
| Howard University | 39 600 |
| Hampton University | 60 336 |
| AKA Sorority | 200* |
| Atlanta Continental Societies | 500* |
| Barnard College | 74 816 |
| Carnegie Mellon University | 77 744 |
| TBS Trumpet Award | 38 640 |
| HOPE Scholarship | 12 000 |
| Mercer University | 10 000 |

N/A : student was accepted but received no scholarship from school

* Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|------|------------------------------------------------|--------|
| | Hope Scholarship | 12 000 |
| | AABE | 750* |
| | Mayor's Scholarship | 1 000* |
| | HOPE Scholarship | 12 000 |
| | Dillard University | 18 400 |
| | Hampton University | 64 800 |
| | Howard University | 10 000 |
| | Johnson & Wales University | 20 000 |
| | University of Miami | 29 000 |
| | North Carolina A&T State University | 4 000* |
| | Savannah State University | 1 500* |
| | Syracuse University (Grant) | 56 000 |
| | Syracuse University (Merit) | 16 000 |
| | College of Choice | 100* |
| | Delta Sigma Theta Sorority, Inc. | |
| | Atlanta Alumnae Chapter | |
| | HOPE Scholarship | 12 000 |
| | Atlanta Technical Institute - HOPE Scholarship | 4 416 |
| | HOPE Scholarship | 12 000 |
| | A. Z. Traylao, Sr. Scholarship | 500* |
| | Corey Alexander Memorial Scholarship | 300* |

N/A : student was accepted but received no scholarship from school

* Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|------|-----------------------------------------------|--------|
| | Stillman College | N/A |
| | The University of North Carolina Greensboro | N/A |
| | Xavier University of Louisiana | N/A |
| | Omega Psi Phi Scholarship | 250* |
| | Georgia Institute of Technology | 24 000 |
| | Grambling State University | 6 000 |
| | Tuskegee University | 18 000 |
| | Kentucky State University | 1 000 |
| | HOPE Scholarship | 12 000 |
| | Columbia College | 21 025 |
| | Morris Brown College HOPE | 12 000 |
| | Continental Society Atlanta Chapter | 300* |
| | HOPE Scholarship | 12 000 |
| | Georgia State University | 48 000 |
| | HOPE Scholarship | 12 000 |

N/A : student was accepted but received no scholarship from school

* Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|------|------------------------------------------------|---------|
| | Atlanta Technical Institute - HOPE Scholarship | 4 416 |
| | HOPE Scholarship | 12 000 |
| | Atlanta Falcons Youth Foundation | 2 500 |
| | Mentoring Scholarship | |
| | Cabrini College | 22 000 |
| | Cabrini College Achievement Grant | |
| | Oxford College of Emory University | 8 000 |
| | Savannah State University | N/A |
| | Stillman College | N/A |
| | Stetson University | 28 000 |
| | Turner Broadcasting System, Inc. Trumpet Award | 5 000 |
| | The University of Georgia | N/A |
| | The University of North Carolina Greensboro | N/A |
| | Xavier University of Louisiana | N/A |
| | HOPE Scholarship | 12 000 |
| | HOPE Scholarship | 12 000 |
| | HOPE Scholarship | 12 000 |
| | Morehouse College | 20 476 |
| | : | |
| | HOPE Scholarship | 12 000 |
| | U.S. Military Academy | 275 000 |
| | West Point | |

N/A : student was accepted but received no scholarship from school

* Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|------|-----------------------------------------------|---------|
| | HOPE Scholarship | 12 000 |
| | North Carolina A&T State University | 1 500 |
| | HOPE Scholarship | 12 000 |
| | American University | 10 000* |
| | Bates College | 80 000 |
| | B.E. Mays Scholar | |
| | Central State University | 26 220 |
| | Clark Atlanta University | 65 552 |
| | De Pauw University | 11 000* |
| | Emory University | 16 842* |
| | Jackson State University | 52 000 |
| | University of Miami | 29 000 |
| | Morehouse College | 40 944 |
| | Morehouse College | 35 236 |
| | Ronald E. McNair Scholar | |
| | Morris Brown College | 40 000 |
| | New York University | 40 000 |
| | Virginia State University | 28 000 |
| | Virginia Union University | 34 000 |
| | HOPE Scholarship | 12 000 |
| | St. Andrews College | 20 000 |
| | Halpern Enterprises, Inc. | 2 500 |

N/A : student was accepted but received no scholarship from school

* Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|------|-----------------------------------------------|---------|
| | HOPE Scholarship | 12 000 |
| | Morehouse College | N/A |
| | HOPE Scholarship | 16 000 |
| | Claffin University | 4 000 |
| | Dillard University | 4 000 |
| | Talladega University | 1 000 |
| | American Association of Blacks in Energy | 1 500 |
| | Georgia State University | N/A |
| | HOPE Scholarship | 12 000 |
| | HOPE Scholarship | 12 000 |
| | Albany State University | 22 500 |
| | Agnes Scott College | 60 000 |
| | College of Choice | 500* |
| | National Black MBA Association | |
| | College of Choice | 2 000* |
| | Greenbriar Mall/ Jim Maddox | |
| | Dillard University | 55 200 |
| | Emory University | 129 600 |
| | MLK Scholarship | |
| | Florida A&M University | 47 532 |
| | Grinnell College | 32 000 |

N/A : student was accepted but received no scholarship from school

*Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|------|-----------------------------------------------|--------|
| | Howard University | 39 800 |
| | New York University | 72 000 |
| | M.L. Scholar | |
| | Rochester Institute of Technology | 32 000 |
| | Smith College | 23 600 |
| | Smith College | 1 000* |
| | Spelman College | 37 120 |
| | Tulane University | 50 000 |
| | Vanderbilt University | 60 800 |
| | Xavier University (LA) | 1 420 |
| | Howard Hughes Biomedical Scholar | |
| | HOPE Scholarship | 12 000 |
| | College of Choice | 500* |
| | Kappa Alpha Psi Fraternity, Inc. | |
| | Atlanta Alumni Chapter | |
| | Florida State University | 8 000 |
| | Howard University | 36 760 |
| | Mercer University | 32 000 |
| | University of Miami | 57 848 |
| | Morehouse College | 20 472 |
| | Morehouse College | 35 236 |
| | Ronald E. McNair Scholar | |
| | North Carolina A&T State University | 32 000 |
| | Rochester Institute of Technology | 16 000 |

N/A : student was accepted but received no scholarship from school

* Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|------|-----------------------------------------------|---------|
| | Temple University | 30 000. |
| | The University of Tennessee (Knoxville) | 1 000 |
| | Tuskegee University | 30 000 |
| | Xavier University (LA) | 37 200 |
| | HOPE Scholarship | 12 000 |
| | Morehouse College | 74 832 |
| | Bradley University | 29 000 |
| | Florida State University | 8 000 |
| | Tuskegee University | 30 000 |
| | Mercer University | 24 000 |
| | Rochester Institute of Technology | 32 000 |
| | Ron E. McNair Scholarship | 37 416 |
| | Navy Scholarship | 80 000 |
| | Stanford University | 32 468 |
| | University of Florida | 16 000 |
| | St. Andrews | 32 000 |
| | HOPE Scholarship | 12 000 |
| | Dillard University | 9 200 |
| | North Carolina A&T State University | 22 000 |
| | Department of the Navy | 20 000 |

N/A : student was accepted but received no scholarship from school

* Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|------|-------------------------------------------------------------------|------------------|
| | 100 Black Men Rites of Passage South Metro Chapter | 2 000* |
| | United Methodist Church | 500* |
| | United Methodist Church General Board of Higher Education | 4 000 |
| | HOPE Scholarship Cornell University | 12 000 90 032 |
| | Cornell University | 6 000* |
| | Emory University | 15 435* |
| | Xavier University (LA) Howard Hughes Biomedical Summer Scholar | 1 420* |
| | College of Choice | 1 100* |
| | The Junior League of Atlanta, Inc. and WXIA TV 11 | 1 100* |
| | College of Choice | 1 000* |
| | Atlanta Mayor's Scholar | 1 000* |
| | College of Choice Greenbriar Mall/ Jim Maddox | 2 000* |
| | College of Choice Nancy Elizabeth Branch | 500* |
| | HOPE Scholarship | 12 000 |
| | Columbia University | 11 000 |
| | Florida A&M University | 75 110 |

N/A : student was accepted but received no scholarship from school

* Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|------|-----------------------------------------------|------------------|
| | Miles College Dean's Aide Scholarship | 32 000 |
| | HOPE Scholarship Maryville College | 12 000 24 000 |
| | HOPE Scholarship Florida A&M University | 12 000 47 532 |
| | Jackson State University | 26 952 |
| | Lincoln University (PA) | 54 120 |
| | Loyola University (ILL) | 12 000 |
| | Morehouse College | 40 952 |
| | Morris Brown College | 40 000 |
| | Tuskegee University | 30 000 |
| | U.S. Military Academy (West Point) | 275 000 |
| | Xavier University (LA) | 37 200 |
| | Xavier University | 37 200 |
| | Loyola University | 40 000 |
| | Texas Christian University | 32 800 |
| | HOPE Scholarship Mercer University | 12 000 20 000 |
| | University of N.C. (Ashville) | 8 800 |
| | University of Tennessee | 12 232 |
| | Winthrop University | 15 200 |

N/A : student was accepted but received no scholarship from school

*Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|------|-----------------------------------------------|---------|
| | Omega Psi Phi Fraternity | 250* |
| | Emory University | 129 600 |
| | MLK Scholarship | |
| | HOPE Scholarship | 12 000 |
| | National Achievement Scholar | 8 000 |
| | Florida A&M Full Scholarship | 104 000 |
| | Boys & Girls Club of America | 1 500* |
| | Howard University | 50 000 |
| | Agnes Scott Achievement Award | 28 000 |
| | Grady Dye Scholarship | 500* |
| | IRS Scholarship | |
| | HOPE Scholarship | 12 000 |
| | Albany State University | N/A |
| | HOPE Scholarship | 12 000 |
| | HOPE Scholarship | 12 000 |
| | Cabrini College | 25 200 |
| | University of Miami | 29 200 |
| | Morehouse College | 20 432 |
| | North Carolina A&T State University | 40 000 |

N/A : student was accepted but received no scholarship from school

*Not a four-year award

**PIPELINE SCHOLARSHIPS AND AWARDS
FOUR-YEAR SCHOLARSHIPS**

| Name | College/University/ Scholarship Foundation | Amount |
|-------------|-------------------------------------------------------|---------------|
| | Holy Cross Grant | 68 000 |
| | Merit Scholarship | 20 000 |
| | Mercer University ~ HOPE | 16 000 |
| | Morehouse College ~ HOPE | 16 000 |
| | Emory University (Benjamin E. Mays Scholarship) | 48 480 |
| | Hope Scholarship | 12 000 |
| | United States Navy Scholarship | 80 000 |
| | Columbia College | 24 000 |
| | Agnes Scott | 34 000 |
| | Spelman College | 37 000 |
| | University of Pittsburgh | 32 000 |
| | Hampton University | 6 500 |
| | Catawba College | 24 000 |
| | Cabrini College | 24 000 |
| | BWCA - Black Women's Coalition of Atlanta | 3 600 |

Appendix B: Scholars Program

**Professional & Graduate Schools
Attended
by
Center Scholars**

**Center of Excellence Scholars
Graduate Schools/Jobs
Fall 2000**

Name

School/Job

Deutsche Banc, New York

University of Illinois/MBA

George Washington School of Law

Georgetown University School of Law

Howard University School of Medicine

Emory University School of Medicine

University of Illinois/Computer Science

Columbia University School of Law

Hampton University/Atmospheric Science

Deutsche Banc, New York

Tufts University School of Dental Medicine

University of Chicago/MD Ph.D

Morehouse School of Medicine

University of Maryland/Masters of EE

Smith Kline Beecham

Emory University School of Medicine

Howard University

**Center of Excellence
Georgia Tech Dual Degree Students**

**Center of Excellence
Georgia Tech Dual Degree Students**

Center of Excellence Scholars Scholarships, Awards, and Fellowships

Tufts University School of Dental Medicine
Partial Scholarship

University of Maryland at College Park
Masters of Electrical Engineering
General Electric Fund Fellowship

Cornell & UC Davis
Fellowship \$9,804
Thomas J. Watson Fellowship \$22,000
Achievement Rewards for College Scientists

University of Michigan
Rackhan Merit Fellowship (RMF)
Research Traineeship Fellowship (RTF)

University of Chicago
Fellowship \$20,000

Georgia Institute of Technology
Presidential Scholarship
Packard Fellowship
NSF Graduate Research Fellowship

Appendix C: General Information

**Center of Excellence
&
E²M Scholars
Lecture Seminar**

**Dr. Philip Phillips
University of Illinois
at
Urbana-Champaign**

***“2e or not 2e in Strongly Repulsive
Electronic Systems in 2D?”***

**Thursday, April 5, 2001
12:00 Noon
Dansby Hall Room 130**

Lunch Will Be Served

Center of Excellence
&
E²M Scholars
Lecture Seminar

Dr. Abdulalim Shabazz
Distinguished Professor
Lincoln University
Why Study Mathematics?

Thursday, June 21, 2001

12:00 Noon

Dansby Hall Room 130

Lunch Will Be Served

Center of Excellence
&
E²M Scholars
Lecture Seminar

Dr. Robert M. Dixon

Morehouse College
Professor and Chair
Department of Physics

Thursday, September 13, 2001

12:00 Noon

Dansby Hall Room 130

Lunch Will Be Served

Center of Excellence
&
E²M Scholars
Lecture Seminar

Dr. Abdulalim Shabazz
Distinguished Professor
Lincoln University

**The Character of a Good Successful
Mentor Teacher**

Thursday, September 20 , 2001
12:00 Noon
Dansby Hall Room 130

Lunch Will Be Served

**Center of Excellence
&
E²M Scholars**

Seminar

**Columbia University
Department of
Engineering**

**Thursday, October 11, 2001
12:00 Noon
Dansby Hall Room 130**

Lunch Will Be Served

**CENTER OF EXCELLENCE
&
E²M SCHOLARS**

- Seminar -

DR. JIMMIE LEE DAVIS, JR.

**Morehouse Alumnus '92
Senior Software Engineer – MITRE Corporation**

**Thursday, October 18, 2001
12:00 Noon**

Dansby Hall Room 130

Lunch Will Be Served

**CENTER OF EXCELLENCE
&
E²M SCHOLARS**

- Seminar -

DR. KEITH BAKER

Dean of Science
Hampton University

Thursday, October 25, 2001

12:00 Noon

Dansby Hall Room 130

Lunch Will Be Served

**CENTER OF EXCELLENCE
&**

E²M SCHOLARS

- Seminar -

SOCIETY OF PHYSICS STUDENTS

PRESENTATIONS BY:

TIMOTHY CHEERS

NICHOLAS BROWN

DAMIAN CUPID

Thursday, November 1, 2001

12:00 Noon

Dansby Hall Room 130

Lunch Will Be Served

**CENTER OF EXCELLENCE
&**

E²M SCHOLARS

- Seminar -

DR. HOWARD JOHNSON

Dean of Graduate Studies

**Professor of Mathematics & Mathematics Education
Syracuse University**

Thursday, November 8, 2001

12:00 Noon

Dansby Hall Room 130

Lunch Will Be Served

**CENTER OF EXCELLENCE
&
E²M SCHOLARS**

- Seminar -

MICHAEL TAYLOR

Morehouse Alumnus '93

Ph.D. Candidate

North Carolina State University

Thursday, November 15, 2001

12:00 Noon

Dansby Hall Room 130

Lunch Will Be Served

**CENTER OF EXCELLENCE
&**

E²M SCHOLARS

- Seminar -

DR. BENJAMIN ZEIDMAN

Senior Physicist
Argonne National Laboratory

Thursday, November 29, 2001

12:00 Noon

Dansby Hall Room 130

Lunch Will Be Served

Center of Excellence

- FEATURING -

Robert M. Dixon, Ph.D.

Professor and Chair,

Department of Physics,

Morehouse College

Thursday, January 10, 2002

12:00 - 1:00 PM

Dansby Hall Room 130

Refreshments Will Be Served

Center of Excellence

- FEATURING -

Dr. Michael Silevitch

Professor of Electrical & Computer Engineering Department,
Northeastern University

Thursday, January 17, 2002

12:00 - 1:00 PM

Dansby Hall Room 130

Refreshments Will Be Served

Center of Excellence

- FEATURING -

Dr. Johnny L. Houston

Morehouse Alumnus '64;

Senior Research Professor,

Department of Mathematics and Computer Science;

Director of Computational Science - Scientific Visualization Center,

School of Mathematics, Science and Technology

Elizabeth City State University

Thursday, January 31, 2002

12:00 - 1:00 PM

Dansby Hall Room 130

Refreshments Will Be Served

Center of Excellence

- FEATURING -

Dr. ABDULALIM A. SHABAZZ

Professor of Mathematics,

Department of Mathematics and Computer Science,

Lincoln University

Thursday, February 7, 2002

12:00 - 1:00 PM

Dansby Hall Room 130

Refreshments Will Be Served

Center of Excellence

- FEATURING -

Dr. PETER OZIMBA

Assistant Professor of Physics,

Spelman College

Thursday, February 14, 2002

12:00 - 1:00 PM

Dansby Hall Room 130

Refreshments Will Be Served

Center of Excellence

- FEATURING -

NORTH CAROLINA STATE

UNIVERSITY

Director of Graduate Studies,

Dr. Michael Payslor

Thursday, February 28, 2002

12:00 - 1:00 PM

Dansby Hall Room 130

Refreshments Will Be Served

Center of Excellence

- FEATURING -

Robert M. Dixon, Ph.D.

Professor and Chair,
Department of Physics,
Morehouse College

Thursday, March 7, 2002

12:00 - 1:00 PM

Dansby Hall Room 130

Refreshments Will Be Served

Center of Excellence

- FEATURING -

Ralph J. Reda, Ph.D.

Master Black Belt,

GE Power Systems

Topic of Discussion:

Power Generation in the 21st Century: Current State and Future Trends

Thursday, March 28, 2002

12:00 - 1:00 PM

Dansby Hall Room 130

Refreshments Will Be Served

Center of Excellence

- FEATURING -

Dr. Charles S. Brown

Chief Scientist

Luxcore Networks, Inc.

Topic of Discussion:

Novel Polarization Control Using Non-Rotating Variable Waveplates

Thursday, April 11, 2002

12:00 - 1:00 PM

Dansby Hall Room 130

Refreshments Will Be Served