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Dear Friends:

Welcome to the third annual report of the Nuclear and Radiological Engineering and Medical Physics Program (NRE/MP) of the George W. Woodruff School of Mechanical Engineering. This report is for the past academic year, summer 2003 through spring 2004.

During this past year, the NRE/MP program continued to grow. Enrollment in the NRE undergraduate program increased substantially with modest increases in the graduate program. The introduction of the Master of Science in Medical Physics degree, mentioned in last year's annual report, was approved by the Board of Regents and students were admitted to the program beginning fall 2004. Student interest has been stronger than anticipated. With a limited enrollment capacity at this time, our selection of students for the program is more than five-to-one. At present, the program is being offered both on campus with limited enrollment as well as by distance learning. The on-campus enrollment is restricted primarily because of the limited capacity in the clinical rotation. Given the interest in the program we hope to expand this capability. Although it is a Georgia Tech degree, the M.S.M.P. is given in collaboration with the Emory University School of Medicine, which is responsible for teaching one or two of the courses and providing the clinical rotation positions for our students.

This past year has been one of positive strides and growth in our NRE/MP program. I hope you find this report informative and that you will help us advance the program even further. Please address any comments about this report or the Nuclear and Radiological Engineering/Medical Physics Program to me at

404-894-3200 or by e-mail to ward.winer@me.gatech.edu.

Ward O. Winer, Ph.D.
Eugene C. Gwaltney, Jr. Chair of the Woodruff School of Mechanical Engineering

CONTACTS

This report is published each fall by the George W. Woodruff School of Mechanical Engineering at Georgia Tech. For more information about the undergraduate and graduate degree programs in nuclear and radiological engineering/medical physics, please contact us by any of the following methods:

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Chair of the NRE/MP Program
George W. Woodruff School of Mechanical Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332-0405

Phone 404-894-3731
Fax 404-894-3733
INFORMATION

Detailed information about the nuclear and radiological engineering/medical physics program may be found online at www.nre.gatech.edu or www.mp.gatech.edu. In addition, copies of our publications may be obtained online or by requesting a copy from the School. New this year are the 2004-2005 editions of Facts About the Woodruff School, the Undergraduate Handbook, the Graduate Handbook, and the Graduate Study Brochure.
Dear Colleagues and Friends:

Welcome to the third edition of the annual report for the Nuclear and Radiological Engineering and Medical Physics (NRE/MP) program. I am pleased to report that the program continues to grow as planned. The Board of Regents approved the new Master of Science program in medical physics (M.S.M.P.) in December 2003. As a result, we changed our name from the Nuclear and Radiological Engineering/Health Physics Program to the Nuclear and Radiological Engineering/Medical Physics Program. The new degree is offered in cooperation with the Radiation Oncology Department of the Emory University School of Medicine in the following manner:

- Georgia Tech admits the graduate students, grants the degree, and offers all the courses.
- Emory teaches the Radiation Therphy Physics course, co-teaches the Diagnostic Imaging Physics course, and accommodates students for four hundred hours of clinical rotation in radiation therapy, nuclear medicine, and diagnostic imaging.

I am also happy to report that the Department of Radiology of the Medical College of Georgia is contributing to this program by teaching the Nuclear Medicine Physics course. We offer the M.S.M.P. program through distance learning with the same admission standards, courses, and degree requirements as in the on-campus program.

Student enrollment continues to increase. Thirty-four entering freshmen out of the seventy-nine applicants joined our undergraduate program this fall. There were seventy-nine medical physics and twenty-two nuclear and radiological engineering applicants in the graduate programs. This fall, we admitted ten on-campus and seventeen distance-learning graduate students in medical physics. All the on-campus students and nine distance-learning students are currently registered in the program. Nine graduate students were admitted into the nuclear and radiological engineering program. The quality of the entering students is excellent, as detailed in the report.

Finally, I would like to welcome Drs. Timothy Fox and Richard Sanchez to the NRE/MP program. Dr. Fox, who joined our MP program as an adjunct assistant professor, is the director of the medical physics program and an assistant professor of radiation oncology at Emory University. Dr. Sanchez, who joins the nuclear and radiological engineering program as an adjunct professor, is the director of research programs in transport theory and numerical methods at Commissariat à l’Energie Atomique (CEA) of Saclay, France.

I hope that you find the information in this report interesting and useful. Please address any questions and comments about this report and the program to me at (404) 894-3718 or to farzad.rahnema@nre.gatech.edu.

Farzad Rahnema, Ph.D.
Associate Chair of the Woodruff School and Chair of the NRE/MP Program
Family Weekend

The Woodruff School held a very successful open house for the families of Woodruff School undergraduates. Many student organizations were represented, including the American Nuclear Society, and some labs were open for inspection. School Chair Dr. Ward Winer welcomed our visitors, and Dr. David Sanborn, Associate Chair for Undergraduate Studies, hosted an information and question-and-answer session about the Woodruff School.

Picnics

The Nuclear and Radiological Engineering Program sponsored two picnics for its students, faculty, and staff: one in the spring and one in the fall. These get-togethers are an opportunity for undergraduate and graduate students in the program to meet and get to know the faculty and staff in a relaxed setting. Dr. Ward O. Winer, School Chair, and members of the Woodruff School’s Administrative, Finance, and Academic Offices, who interact with the NRE program, also attended the events. The picnics were held near the Neely Research Center.

Outstanding Seniors

Each fall, the Woodruff School sponsors a dinner for outstanding Woodruff School seniors who are eligible to attend graduate school based on their academic record (a GPA of 3.5 and above). About eighty-five people attended the event and listened to faculty members explain anecdotally the reasons to attend graduate school. It was also an opportunity for the seniors to meet some current graduate students and learn about their experiences. Information was available on the application process, fellowships, financial aid, and study-abroad programs.

The NRE/MP program also holds one or two luncheons with selected seniors from programs such as Biomedical Engineering, Chemical Engineering, Electrical Engineering, Mechanical Engineering, Mathematics, and Physics to discuss graduate school opportunities at Georgia Tech in the NRE/MP program.

Faculty Retreat

In May 2004, the NRE/MP program held a day-long faculty retreat in the Global Learning and Conference Center at the New Technology Square. The purpose of the meeting was to review the current undergraduate and graduate curricula in the programs with emphasis on the flexibility of the curricula. The Ph.D. qualifying exams were revised in anticipation of the replacement of the health physics program with the new medical physics program. The 2004-2005 Woodruff School Graduate Handbook has details about the health physics transition plan and the new medical physics program.

Student Design Contest

The Georgia Tech entry in the undergraduate category was chosen as a finalist in the 2004 American Nuclear Society International Student Design Competition. The entry was based on the design project that was done in the senior capstone design course (NRE 4232, Nuclear and Radiological Engineering Design) taught by Dr. Weston Stacey. The other finalists are the University of Florida, the University of Michigan, and the University of Tennessee. Each team will give an oral presentation describing their work in front of a second panel of judges at the ANS meeting in Washington, D.C.; the judges will then select a winner.

Tech's Engineering Reactor Days Are Over

The Nuclear Regulatory Commission processed the paperwork that released Georgia Tech from its operating license, so the Institute's days as a university with a research reactor officially are over. The actual work to decommission the nuclear reactor was completed more than a year ago, according to Dr. Nolan Hertel, director of the facility.

At the time it was built, the Frank H. Neely complex cost $4.5 million, the largest construction project Georgia Tech had undertaken to that point. The facility was named for Frank Neely (BME 1904) because the executive vice president of Rich's department stores was instrumental in raising funds in the early 1960s to bring the reactor to Georgia Tech.

The nuclear reactor was shut down on November 17, 1995, and the eight pounds of high-grade uranium-235 removed well before the campus served as home of the Olympic village for the 1996 Summer Games.

Tech announced it would decommission the reactor in 1997. The price tag for dismantling the reactor and disposing the waste was pegged at $7.5 million. Much of that cost was due to the expensive disposal of waste. "It costs a lot to bury anything that is even supposedly radioactive," Hertel said. "Some of it is buried at a cost of several hundred dollars a square foot." No plans have been announced for the site of the now empty reactor building.
Accreditation

Georgia Tech has institutional accreditation from the Southern Association of Colleges and Schools (SACS). The College of Engineering and its schools are accredited by the Accreditation Board for Engineering and Technology (ABET). The Co-op Program is accredited by the Accreditation Council for Cooperative Education.

Rankings

Georgia Tech and its programs are highly regarded, which is reflected in current rankings. According to U.S. News & World Report:

- Georgia Tech is ranked 9th among public universities and 41st among all universities.
- The College of Engineering ranks 5th in the nation.
- The Georgia Tech Co-op Program ranks 3rd as a Program That Works.
- The undergraduate nuclear and radiological engineering program is ranked 11th in the nation.

Other rankings relevant to the Woodruff School include:

- The National Science Foundation ranks Georgia Tech 2nd in engineering R&D and 4th in industry sponsored research.
- Black Issues in Higher Education named Georgia Tech the number one producer of African-American engineers at the bachelor's and master's degree levels.
- The Engineering Workforce Commission ranks Georgia Tech first in the number of degrees awarded in engineering and first in the number of engineering degrees awarded to women in engineering.

The Academic Common Market

The Academic Common Market (ACM) provides an exciting opportunity for students from the southeast whose state universities do not offer a bachelor's degree in Nuclear Engineering. Students accepted to Georgia Tech in the bachelor's degree program in nuclear and radiological engineering pay (Georgia) in-state tuition and must maintain ACM status through academic achievement. Students who are legal residents of Alabama, Arkansas, Kentucky, Louisiana, Maryland, Mississippi, Oklahoma, South Carolina, Virginia, and West Virginia are eligible for the program.

The Undergraduate Program

The undergraduate program in nuclear and radiological engineering leads to the B.S.N.R.E. degree and is structured to meet the needs of the student who contemplates employment immediately after graduation and the student planning to pursue graduate study. It provides maximum flexibility, such as options for each student to develop his or her unique interests and capabilities.

The strength of the undergraduate curriculum is its breadth in many of the fundamental disciplines of NRE (radiation detection, radiation transport and interaction with matter, reactor physics, reactor engineering, nuclear chemical processing, plasma physics, and fusion technology). The curriculum is designed to provide students with a strong background in these fundamental disciplines of NRE, as well as in complementary engineering fundamentals of physics and mathematics.

The Undergraduate Academic Advisor

Ms. Kristi Lewis joined the Woodruff School as an Academic Professional and the Woodruff School's new Undergraduate Academic Advisor. She is a 1994 honors graduate of the Woodruff School's mechanical engineering program. While here she was a member of the marching band and was a co-op student at Ford Electronics. She also has a master's degree in Mechanical Engineering from Clemson University and ten
years of industrial experience as a mechanical engineer. Her industrial experience includes manufacturing, design, and supervisory positions.

Because she went to Georgia Tech, she brings certain skills to her new position; “I think my biggest advantage in working with the students is that I was also a student in the Woodruff School. I understand the stresses that Georgia Tech students see, and I think that my work experience is helpful in offering students advice on careers, co-op positions, and internships.”

Kristi enjoys working with students. Her goal is to give Woodruff School students the support they need to have a successful academic career at Georgia Tech.

NRE Academic Advising

A faculty mentor/advisor is assigned to each undergraduate student upon entry to the NRE program. This is in addition to the Undergraduate Academic Advisor. The faculty mentor is responsible for course advising, professional development, and assists the students with career planning and research opportunities.

The Undergraduate Cooperative Program

Since 1912, Georgia Tech has offered a five-year cooperative program to those students who wish to combine career-related experience with classroom studies. The program is the fourth oldest of its kind in the world and the largest optional co-op program in the country. Students who enroll in the program alternate between industrial assignments and classroom studies on a semester basis, completing the same course work in five years that is completed by regular four-year students. Graduates of the program receive the B.S.N.R.E., with a Cooperative Plan designation. Seventeen nuclear engineering students participated in the program in the past academic year. The job placement rate for program participants after graduation is very high; many take a permanent position with the company in which they did co-op work.

Undergraduate Research

Undergraduate research in the Woodruff School is usually performed as a Special Problems Course. Students work with a faculty member, and can do the work for course credit or pay, part-time or full-time. Each special problem culminates in a written final report. Dr. David Sanborn, Associate Chair for Undergraduate Studies, administers the program.

Opportunities for funding exist from the President's Undergraduate Research Awards (PURA). The Undergraduate Studies Office funds requests by faculty/student teams to support undergraduate student involvement in faculty research. These awards are for student salaries and travel expenses to attend professional meetings. In the past academic year, NRE student Justin Pounders received PURA funding for a project on the Development of a Benchmark Problem for a New Coarse-Mesh Transport Method. Dr. Farzad Rahnema was the advisor on the project.

The NRE/MP program encourages and supports undergraduate research by providing up to five qualified students between $800 and $1,000 per student in salaries, travel, and/or equipment. This program is funded by the Department of Energy/Industry Matching Grant Program.

The Five-Year BS/MS Degree Program

In fall 2001, outstanding freshman and sophomore students in the Woodruff School were invited to apply to the new Five-Year BS/MS Degree Program, the first program of its kind on campus. Students can earn two degrees in a five-year period, which provides a tremendous advantage when entering the job market. It might also be an impetus to continue for the doctorate. The program is individualized with numerous opportunities for faculty and students to interact, including mentoring and undergraduate research. Graduate course work begins in the senior year. The degrees can be obtained in various combinations, such as a B.S. and an M.S. in NRE, a B.S. in NRE and an M.S. in MP. Entry into the B.S.N.R.E./M.S.M.P. program is limited due to the clinical rotation requirement in the medical physics program. The first person to complete the Five-Year program finished a master's degree in 2003. Ryan Lorio received his B.S.N.R.E. and matriculated in the graduate program in the past academic year. Nolan Hertel is his advisor. This is a very popular program, which has an increasing number of applicants each year. Dr. Tom Kurfess is the Program Director.
The Graduate Program

The Woodruff School has a challenging graduate program that encompasses advanced study and research. In nuclear and radiological engineering, opportunities exist for students to specialize by combining various courses offered in the NRE/MP program with courses from programs in other schools at the Institute. The program in medical physics leads to the M.S.M.P. The M.S.M.P. program is also available to working professionals through video technologies. Most graduate course work at the master's level is elective, but the program of study must meet the requirements of breadth, depth, and level. Thirty semester hours of course work are required for the master's degree; there is a thesis or nonthesis option.

The objective of the master's degree program is to prepare graduates for advanced-level jobs in industry or for advanced study leading to the doctoral degree in Nuclear Engineering. There are four required nuclear engineering courses (transport fundamentals, reactor physics, reactor engineering, plasma physics) in the master's degree curriculum, plus the requirement for a thesis or an advanced design course, for a total of thirty credit hours. Including a requirement for an advanced mathematics course, there are two elective courses in the thesis option and four in the nonthesis option.

The objective of the Ph.D. program is to prepare students for research and leadership positions in industry, universities, and research laboratories. In addition to a dissertation, written and oral qualifying examinations, the doctoral degree requires forty-two semester hours beyond the bachelor's degree or its equivalent. Included is a minimum of nine credit hours of course work in a minor area that is distinctly different from the major area. Students should aim to complete the Ph.D. degree some three to four years after obtaining the master's degree or after entering the Ph.D. program. Students must submit a Ph.D. proposal that describes the goals and objectives of their research after the successful completion of the Ph.D. qualifying exams.

Overview of the Graduate Program

According to Dr. Yogendra Joshi, Associate Chair for Graduate Studies, in the past academic year the Office of Student Services, under the leadership of Dr. Wayne Whiteman, took a number of steps to increase the efficiency and quality of their services. A web-based Student Financial Support Tracking System is now in place. Once an electronic form is submitted, only updates are entered in subsequent semesters. Another achievement was the development of a comprehensive database of currently enrolled students and new applicants. This allows the faculty to review the credentials of applicants hours after these are received at the Institute. This process used to take several weeks. We also implemented the Online Assessment and Tracking System (OATS) to document the educational objectives of our programs, and to assess how well these are being achieved by our graduates. The system allows us to monitor progress toward our stated goals and to put in place corrective measures, as needed.

Women and Minorities in the Graduate Program

The Woodruff School continues to be a leading producer of graduate degrees to women and minorities. In the 2003-2004 academic year, six women earned their doctoral degrees (5 ME, 1 NE/HP) and seventeen women earned the master's degree (15 in ME and 2 in BIOE). The first Ph.D. in the Woodruff School given to a woman was awarded to Denise Noonan in Health Physics in 1984. In 1987, Mardi Hastings was the first woman to earn a Ph.D. in mechanical engineering. To date, 75 women have earned the Ph.D. from the Woodruff School; nineteen of these have been in nuclear engineering/health physics. One-hundred-and-eleven women have earned their master's degree in NE/HP; the first was awarded to Catherine Card in 1980.

The Woodruff School granted its first doctoral degree to a minority student in 1978. Since then, 64 minority students have received the Ph.D.; ten were in nuclear engineering. No minority students earned a Ph.D. in NE in the past academic year. In addition, twenty-seven master's degrees were awarded to minorities, none of these went to minority students in NE/HP.

New Degree Program: Medical Physics
The Woodruff School is pleased to announce that the Board of Regents has approved a master's degree program in Medical Physics (M.S.M.P.) to be offered by the Nuclear and Radiological Engineering Program in cooperation with the Emory University School of Medicine, beginning in fall 2004. There are currently about five thousand practicing medical physicists in the United States. Due to the increased complexity of equipment and the patient population, there is a steady increase in the demand for appropriately trained medical physicists. Employment prospects are excellent and salaries for these positions are high.

Students will register and take courses at Georgia Tech. Emory will teach the Radiation Therapy Physics course and part of the Diagnostic Imaging Physics course. The Medical College of Georgia also contributes to this program by teaching the Nuclear Medicine Physics course. On-campus students in this program will intern at Emory University's hospitals and clinic to gain the required four hundred hours of clinical experience in radiation therapy, nuclear medicine, and diagnostic imaging. The curriculum has both a thesis and nonthesis option. Both options include seven required courses and a clinical rotation. The program is designed to be completed in one-and-one-half years by well-motivated, full-time students. The degree program is also available to distance-learning students at Georgia Tech. There is also a suggested two-and-a-half year curriculum (nonthesis) for distance-learning students. Fall enrollment for the program includes ten on-campus students and nine distance-learning students.

The clinical rotation and laboratory course of the medical physics program is designed to familiarize students with the hospital/clinical environment; this rotation is vital to the program because medical physics is a profession where practical experience must supplement theory and where textbook knowledge alone is not sufficient. The course is divided into three parts: clinical rotation, laboratory, and academics. The clinical rotation is designed to expose students to the daily activities of the clinical physicist as well as possible special procedures involving patients. Students will rotate through the Emory University School of Medicine facilities, including Emory University Hospital, Atlanta Veteran's Administration Hospital, Crawford Long Hospital, and Grady Hospital. Clinical and practical exposure will be gained in radiation therapy, diagnostic imaging, and nuclear medicine. Distance-learning students can fulfill the clinical rotations and laboratories at a facility near their work location.

The Health Physics Program

After much discussion, the NRE faculty decided to phase out the Health Physics Program in order to concentrate effort in directions that they believe are in the best interest of the NRE program and Georgia Tech. The decision was also based on low and declining on-campus health physics student enrollment and the need to rebuild the NRE program in response to a steady increase in NRE enrollment in recent years. The type of research formerly included under the health physics program will be pursued in the radiological option of the NRE program.

Although the program is being phased out, all current students will be allowed to complete their degree in a timely manner. A transition plan was developed by the NRE faculty to be implemented over a span of four semesters, beginning in fall 2003 and ending in spring 2005. Seven required/elective health physics courses will be offered during this period, which is sufficient for the current distance-learning students to complete their course requirements. These courses will be offered only once, so students are strongly encouraged to take the needed health physics courses when they are offered. The faculty is working with the students to make this transition as seamless as possible.

Learn From a Distance

The Woodruff School's new M.S.M.P. degree is part of its distance-learning program. The health physics master's degree is being phased out, but distance students will have time to complete their program. Off-campus students may elect to take video classes, Internet courses, or classes in a combination of the two formats. CD's are the preferred format. The admission requirements, the courses, and the degree received are the same as for on-campus students.

We offer approximately twenty Woodruff School courses each semester, except during the summer. Three health physics courses and three medical physics courses are being offered in the distance-learning program in fall 2004. In the past academic year, thirteen health physics graduate students were involved in distance-learning classes. Many of these students have their tuition paid for by their employer. Seventeen new distance-learning students in medical physics were admitted to the Woodruff School in fall 2004; nine have enrolled so far. In addition, seven students are currently enrolled in health physics courses. One NE student completed the requirements for the master's degree (nonthesis) through the distance program from summer 2003 through spring
The Graduate Cooperative Program

The graduate cooperative program was established in December 1983 and is currently the largest such program in the United States for science and engineering. In 2003, there was one nuclear engineering student enrolled in the program. In 2003, 150 students received their Georgia Tech degrees with Graduate Co-op Program certificates. One-hundred-and-forty-six companies participated in placing students, an increase over the previous year.
Our most important asset is our students. Enrollment in nuclear and radiological engineering in recent years has increased, particularly in the undergraduate program. In fall 2004, the enrollment in the program by ethnicity and degree is:

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Bachelor's Degree</th>
<th>Master's Degree</th>
<th>Doctoral Degree</th>
</tr>
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<tbody>
<tr>
<td>Asians</td>
<td>15</td>
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<td>0</td>
</tr>
<tr>
<td>Blacks</td>
<td>6</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Hispanics</td>
<td>3</td>
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</tr>
<tr>
<td>Native Americans</td>
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<td>0</td>
</tr>
<tr>
<td>Whites</td>
<td>90</td>
<td>31</td>
<td>5</td>
</tr>
<tr>
<td>Multiracials</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Internationals</td>
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<td>8</td>
</tr>
<tr>
<td>Totals</td>
<td>115</td>
<td>39</td>
<td>16</td>
</tr>
</tbody>
</table>

Of the 115 undergraduate students, there are 38 freshmen, 31 sophomores, 25 juniors, and 21 seniors. By gender, there are 95 males and 20 females. Of the 55 graduate students (29 NE, 19 MP, and 7 HP), 39 are male and 16 are female.

Freshman Class Profile

There are 38 freshmen (34 entering students) in fall 2004 in the nuclear and radiological engineering program.

| Average SAT Score (out of 1600) |
|-------------------------------|-----------------|
| Nuclear Engineering           | 1351            |
| Georgia Tech                  | 1336            |

High School Grade Point Average

<table>
<thead>
<tr>
<th>Nuclear Engineering</th>
<th>3.74</th>
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</thead>
<tbody>
<tr>
<td>Georgia Tech</td>
<td>3.72</td>
</tr>
</tbody>
</table>

Demographics

| Females | 6     |
| Males   | 28    |

Ethnicity

| Asians | 5     |
| Blacks | 2     |
| Hispanics | 1 |
| Whites | 26    |

Residency

| Georgia Residents    | 7     |
| Out-of-State Residents| 27    |

The 34 entering freshmen come from Alabama 3, Arizona 1, Colorado 1, Florida 2, Georgia 7, Kentucky 3, Louisiana 3, Maryland 1, Mississippi 1, New Jersey 2, Oklahoma 1, South Carolina 4, Tennessee 1, Virginia 2, Washington 1, and India 1.
### Graduate Class Profile

Twenty-eight (9 NE, 19 MP) graduate students started in fall 2004. The entering students in medical physics, both on-campus and in the distance-learning program, had a grade point average of 3.45 and GRE scores of: 550 verbal, 733 quantitative, and 4.8 analytical, on a six-point scale. The entering graduate students in nuclear and radiological engineering had a grade point average of 3.40 and GRE scores of: 501 verbal, 754 quantitative, and 4.4 analytical, on the six-point scale.

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### By Degree

<table>
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<tr>
<th>Year</th>
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<th>Master's Degree</th>
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</tr>
<tr>
<td>2004</td>
<td>115</td>
<td>39</td>
<td>16</td>
</tr>
</tbody>
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The following degrees are awarded in the program:

- Bachelor's of Science in Nuclear and Radiological Engineering (B.S.N.R.E.)
- Master of Science in Health Physics (M.S.H.P.)
- Master of Science in Medical Physics (M.S.M.P.)
- Master of Science in Nuclear Engineering (M.S.N.E.)
- Master of Science (M.S.)
- Doctor of Philosophy (Ph.D.)

Degrees Awarded in the College of Engineering
(Summer 2003 to Spring 2004)

<table>
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<th>Program</th>
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<td>Biomedical Engineering</td>
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<tr>
<td>Chemical and Biomolecular Engineering</td>
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<tr>
<td>Civil and Environmental Engineering</td>
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<td>Mechanical Engineering</td>
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<td>29</td>
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<tr>
<td>Nuclear and Radiological Engineering/Health Physics</td>
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<td>1</td>
</tr>
<tr>
<td>Polymer, Textile and Fiber Engineering</td>
<td>16</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td><strong>Totals for COE</strong></td>
<td><strong>1386</strong></td>
<td><strong>858</strong></td>
<td><strong>233</strong></td>
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Degrees Awarded by Academic Year in Nuclear Engineering

<table>
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<tr>
<th>Year</th>
<th>Bachelor's Degree</th>
<th>Master's Degree</th>
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<td>1997-1998</td>
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<td><strong>Totals</strong></td>
<td><strong>49</strong></td>
<td><strong>92</strong></td>
<td><strong>36</strong></td>
<td><strong>177</strong></td>
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Undergraduate Degrees

During the past academic year, ten undergraduate degrees were awarded in nuclear and radiological engineering: one degree in summer 2003, and nine in spring 2004. Of these graduates, two were female and eight were male. By ethnicity, all ten undergraduates receiving their bachelor's degree were white.

**Summer 2003**

- Victor Popp

**Spring 2004**

- Victoria Beavers
- Ryan Lorio
- William Casino
- Ashley Manzoor
- Jesse Cheatham
- Charles Peabody
- Ryan Green
- Matthew Terry
- Jesson Hutchinson

Graduate Degrees

In the past academic year, three graduate degrees were awarded: one master's degree in health physics, one master's degree in nuclear engineering, and one Ph.D. By gender, two males received master's degrees (1 NE, 1 HP) and one female received a Ph.D. By ethnicity, one student receiving a master's degree was white and one was an international student. The student who received the Ph.D. was white.

**Summer 2003**

- **Michael Shannon (M.S.H.P.)**
  - Advisor: Nolan Hertel
  - Title: An Illicit Nuclear Material Detection System Based on Photoneutron and Photofission Interactions
  - Previous School: Embry-Riddle Aeronautical University

**Spring 2003**

- **Keith Haufler (M.S.N.E.)**
  - Advisor: Nolan Hertel
  - Title: Nonthesis
  - Previous School: U. S. Military Academy

- **Karen Kelley (Ph.D. NE)**
  - Advisor: Nolan Hertel
  - Title: Gadolinium – 148 and Other Spallation Production Cross Section Measurements for Accelerator Target Facilities
  - Previous School: North Carolina State University
HOPE Scholarships

Many undergraduate students in the Woodruff School receive some type of scholarship. Half of our in-state students receive HOPE scholarships, the tuition program financed through the Georgia State Lottery.

President's Scholars

The President's Scholar Program identifies students who have excelled in academia and leadership. Financial awards are for four academic years, and students are expected to maintain honors-level academic performance and to be involved in campus or community activities. The program is funded entirely by endowments and annual contributions from Georgia Tech's alumni, industry supporters, and other friends through the Roll Call annual giving program. NRE majors, David Harris and Alex Johnson, are returning President's Scholars.

Women in Engineering Scholarships

In spring 2004, a number of Woodruff School students received scholarships from the Women in Engineering Program. NRE student Sarah Brashear won the Boeing Scholarship.

According to Dr. Mimi Philobos, Director of the Women in Engineering Program, there were a record number of 409 women engineering students with a grade point average of 3.35 and above.

NRE Scholarships

Unique scholarship opportunities exist for undergraduate students in nuclear and radiological engineering. Most scholarships begin in the freshman year and are based on academic achievement. Exelon Corporation has committed funds toward the scholarship program for the next academic year. Current holders of the scholarships and their sponsors are:

CH2M-Hill Scholarships
Bernard Jones
Robert Worrall

Department of Energy/Industry Matching Grant
Sarah Brashear (Duke)
Ashby Bridges (Duke)
Gavin Chu (Duke)
Emily Colvin (Duke)
Alex Johnson (Framatome)
Joshua Lee (McCallum-Turner)
Brett Maclaren (Duke)
Jeffrey Regan (CH2M-Hill)
Zachary Sizemore (Duke)
Steven Tyber (MGPI)

Duke Energy Corporation Scholarships
Amanda Bryson
Obert Chen
Sherard Chiu
James Ganong
Jimmy Jiang
Brian Rotolo
Christopher Sommer
Tyler Sumner
Jane Wagner
James Weathers

Framatome-ANP Scholarships
Cristopher Myers

McCallum-Turner Scholarships
Kimberly Burns
Robert Edmonds
Jeffrey Head
Franklin Hope

MGP Instruments Scholarships
Charbak Mitra

Woodruff School NRE Scholarship
Steven Hamilton
Perry Johnson
Kevin Riggs
There are a number of organizations for Woodruff School students to join. These organizations offer a unique opportunity to learn about the many facets of nuclear and radiological engineering, provide an opportunity to meet practicing professionals, and provide valuable service to the program. These groups are especially for NRE students.

**American Nuclear Society**

The student section of the American Nuclear Society (ANS) is the link for prospective nuclear engineers with their chosen profession. The section holds monthly meetings which feature presentations by practicing engineers. Dr. Cassiano de Oliveira is the group's faculty advisor.

**Student Advisory Committee**

The Nuclear and Radiological Engineering/Medical Physics Student Advisory Committee acts as a liaison between the NRE administration and students, provides the administration with commentary on the current status of the program, including issues that directly affect the students, and notes items that will improve faculty and student relations. Appointments to the committee are made by the chair of the program, Dr. Farzad Rahnema. The committee is comprised of up to two students from each class, freshman to senior, plus master's and doctoral students. Members in the past academic year were Sarah Brashear (Secretary), C. J. Font, Zach Friis (Chair), Frank Hope, Adam Jones, Crystal Kelley, Ryan Lorio, Hyeong-Kae Park, Jeff Preston, and Lee Tschaepe.
The job market has strengthened somewhat for graduates of the Woodruff School during the past academic year. At graduation in spring 2004, 64 percent of those getting a degree and not going to graduate school, had jobs in industry. This is a significant increase over last year, when 44 percent of Institute graduates had jobs at commencement.

In 2003, employers conducted more than 7,100 interviews on campus through Career Services. These employers represent a substantial number of the Fortune 500 corporations as well as many state and regional organizations. The number of companies visiting Georgia Tech that wish to recruit Woodruff School student is high.

The average reported starting salaries in spring 2004 for those with a B.S.N.R.E. was $51,000. There is no reported starting salary information for those receiving master's or doctoral degrees in nuclear engineering. These numbers reflect only those students who reported salary information to Career Services, which is a small percentage of our graduates.
SAID I. ABDEL-KHALIK, Southern Nuclear Distinguished Professor
Ph.D., University of Wisconsin, 1973

Descriptors: Reactor engineering and thermal-hydraulics; two-phase flow and heat transfer; and inertial fusion technology.

Research (Fission)

Dr. Abdel-Khalik conducts experimental and numerical research in both mechanical and nuclear engineering. Current experimental research projects include investigation of the root-cause mechanism for axial offset anomaly in pressurized water reactors, single and two-phase flow and heat transfer in microchannels with emphasis on accelerator targets and resistive magnet systems, first wall protection schemes for inertial fusion reactors, EHD enhancement of convection and boiling heat transfer for microgravity applications, and fuel cells' performance enhancement. Current numerical research efforts include multifluid modeling of transient nonequilibrium two-phase flow, Rayleigh-Taylor instability of bounded layers with surface injection, thermal analysis of dry cask spent nuclear fuel storage systems, and density wave instabilities in boiling water reactors.

Distinctions

• Georgia Institute of Technology
  - Outstanding Service Award, 2003
  - Outstanding Doctoral Thesis Advisor Award, 1998
  - Outstanding Faculty Leadership for the Development of Graduate Research Assistants Award, 1994
• Jack M. Zeigler (BME 1948) Woodruff School Outstanding Educator Award, 2000
• American Society for Engineering Education (Nuclear Engineering Division) Glenn Murphy Award, 1999
• American Society of Mechanical Engineers Fellow, 1999

• American Nuclear Society Fellow, 1995

CASSIANO DE OLIVEIRA, Professor
Ph.D., University of London, England, 1987

Descriptors: Numerical radiation transport, computational fluid flow, molecular flow modeling, inverse problems and optimization, and numerical modeling of physical phenomena.

Research (Fission)

Dr. de Oliveira's main research interest is in the development of advanced computational methods for the practical solution of complex problems which arise in nuclear engineering and other fields of engineering and physical science. Current research focuses on deterministic radiation transport methods on unstructured computational grids, solution selfadaptivity for optimizing computational effort and accuracy, high-performance computing, inverse photon scattering problems, nonlinear coupling of different physical phenomena and mathematical optimization. Applications provide the main drivers for the research and they span the areas of nuclear engineering (reactor physics, shielding and criticality safety), atmospheric and cloud physics, medical physics (optical tomography), nuclear geophysics, and oceanography.

Distinctions
NOLAN E. HERTEL, Professor
Ph.D., University of Illinois, 1979

Descriptors: Radiation shielding, neutron dosimetry, radiological assessment, radioactive waste management, accelerator sources and applications, and high-energy particle transport

Research (Fission)

Dr. Hertel's research interests include neutron benchmark experiments and the integral testing of neutron data, radiation dosimetry and shielding, air-scattered radiation, high-energy particle transport, and radiological assessment. Dr. Hertel has several ongoing research projects in neutron dosimetry, instrument response, high-energy particle transport, space radiation shielding, and neutron therapy facility design. One of his research activities addresses the redesign of a fast neutron cancer radiotherapy target at Fermilab to extend its applicability to include boron capture therapy enhancement of the fast-neutron tumor dose. Dr. Hertel has an ongoing project with the University of Kentucky in the testing of new space radiation shielding materials. He is also performing modeling studies to assess the use of common hospital radiation detection systems as whole body counters for use in emergencies, such as the explosion of a radiological dispersion device.

Distinctions

- American Nuclear Society
  - Scholarship Policy and Coordination Committee Chair, 2003-2005
  - Radiation Protection and Shielding Division Executive Committee, 2004-2007
- American Society for Engineering Education (Nuclear and Radiological Division) Glenn Murphy Award for Outstanding Contributions to the Practice and Teaching of Nuclear Engineering, 2004
- Georgia Institute of Technology Sam Nunn School of International Affairs, Sam Nunn Security Program Senior Fellow, 2004-2005
- U.S. Department of Energy Russian Health Studies Program, Scientific Review Group Member
- Registered Professional Engineer in Georgia

FARZAD RAHNEMA, Professor and Associate Chair of the Woodruff School, Chair of the Nuclear and Radiological Engineering/Medical Physics Program
Ph.D., University of California, Los Angeles, 1981
**Descriptors:** Reactor physics, perturbation and variational methods, numerical/computation transport theory, criticality safety

**Research (Fission/Medical Physics)**

Dr. Rahnema's current research activities are in computational reactor physics, transport theory, and criticality safety as well as variational and perturbation theory. The main thrust of his work is the development of highly efficient and accurate coarse-mesh radiation transport methods for criticality analysis in reactor cores and spent fuel configurations and dose estimation in cancer patients. Two approaches are under development: one is based on coupled stochastic and deterministic methodology and the other is purely deterministic, using discontinuous variational and nonvariational techniques. The two approaches differ in the techniques used in the expansion of the interface angular flux in terms of the angular and spatial variables. Another area of research is a coupled Monte Carlo and deterministic diffusion theory method for criticality analysis of loosely and tightly coupled lattice systems such as those in reactor and spent fuel configurations, respectively. The main purpose of this investigation has been to develop coarse-mesh methods for estimating homogenized diffusion coefficients that lead to diffusion results with Monte Carlo accuracy. Ongoing collaboration with the Idaho National Laboratory involves the development of a coupled coarse mesh diffusion/transport method in cylindrical geometry and a cell-homogenized cross section generation methodology in three-dimensional lattice configurations typical of High Temperature Gas Cooled Reactors.

**Distinctions**

- American Nuclear Society
  - Fellow, 2003
  - Mathematics and Computation Division Executive Committee, 2002-2005
  - Reactor Physics Division Secretary, 2002-2005
- Southeast Universities Nuclear Reactors Institute for Science and Education Steering Committee Chair, 2002-present
- 16th International Conference on Transport Theory Organizing Committee Chair, 1999
- Transport Theory and Statistical Physics Journal ICTT Conference Special Issue Guest Editor, 1999

**WESTON M. STACEY, JR., Fuller E. Callaway Professor in Nuclear Engineering and Regents’ Professor**

Ph.D., Massachusetts Institute of Technology, 1966

**Descriptors:** Fusion engineering, plasma physics, and reactor physics

**Research (Fusion)**

Dr. Stacey’s research has two principal thrusts. *Experimental Plasma Physics Analysis and Supporting Theory:* Dr. Stacey’s group in the Fusion Research Center (FRC) formally collaborated with the DIII-D National Fusion Facility in the planning, data analysis, and interpretation of plasma physics experiments in the DIII-D tokamak, informally collaborated with the German TEXTOR tokamak group in the analysis of a series of experiments, and independently carried out supporting plasma theory and code development. During the past year, this work concentrated on understanding density limits, calculating plasma rotation and transport, and understanding phenomena in the edge plasma which play a major role in plasma confinement. *Next-Step Fusion Device Design:* Dr. Stacey’s group in the FRC performed plasma physics analysis in support of the national design effort for the FIRE burning plasma experiment and developed the concept of the Fusion Transmutation of Waste Reactor, a subcritical nuclear reactor driven by a fusion neutron source which would transmute the long-lived actinides in spent nuclear fuel.

**Distinctions**

- American Nuclear Society
  - Wigner Award, 2003
  - Glenn T. Seaborg Medal, 2001
C.-K. CHRIS WANG, Associate Professor
Ph.D., Ohio State University, 1989

Descriptors: Radiation detection and dosimetry, medical and industrial applications of ionizing radiations, and spent nuclear fuel measurements

Research (Medical Physics/Fission)

Dr. Wang’s research includes both experimental and computational studies on the radiation detection and dosimetry problems that involve neutrons, photons, and charged particles. He has had a long-term research interest in the development of various neutron-based cancer treatment modalities including fast neutron neutron therapy and neutron capture therapy. Dr. Wang’s recent collaboration with the Oak Ridge National Lab (ORNL) and the Isotron Inc. has resulted in the successful development of a new generation of high-intensity miniature 252Cf source seeds, making the interstitial 252Cf brachytherapy a practical modality for cancer treatment. His research projects include the biophysical modeling of radiation effects on cells and the in-phantom neutron dose measurement using radiochomic films.

Distinctions

• Sigma Xi (Georgia Tech Chapter) Advisor for Best Doctoral Dissertation (Advisor to Thomas M. Evans), 1997
• Registered Professional Engineer in Kansas

AFFILIATED FACULTY

S. MOSTAFA GHIAASIAAN, Professor
Ph.D., University of California, Los Angeles, 1983
Descriptors: Multiphase flow, aerosol and particle transport, microscale heat transfer, and nuclear reactor thermohydraulics
SHELDON JETER, Associate Professor
Ph.D., Georgia Institute of Technology, 1979
Descriptors: Thermodynamics, energy systems, and heat transfer

JACK LACKEY, Professor
Ph.D., North Carolina State University, 1970
Descriptors: Nuclear fuel and waste processing, ceramic and metallic coatings, composites, and rapid prototyping

ADJUNCT MEDICAL PHYSICS FACULTY

ZONG JIAN (Z. J.) CAO, Adjunct Associate Professor
Associate Professor, Department of Radiology, Medical College of Georgia
Ph.D. (Nuclear Physics), Indiana University, 1986
Descriptors: Nuclear medicine, single photon emission computed tomography, positron emission tomography, and internal dosimetry estimation

ERIC ELDER, Adjunct Assistant Professor
Assistant Professor, Radiation Oncology Program, Emory University and Director of Clinical Medical Physics, Emory University School of Medicine
Ph.D., Georgia Institute of Technology, 1997
Descriptors: Clinical rotation, image-guided radiation therapy methods of patient setup, target localization and dynamic target alignment, and endovascular brachytherapy

TIMOTHY FOX, Adjunct Assistant Professor
Director of Medical Physics and Assistant Professor, Radiation Oncology Program, Emory University
Ph.D., Georgia Institute of Technology, 1994
Descriptors: Optimization algorithms, clinical decision making software, dose calculation, visualization, medical imaging, advanced treatment planning systems, and intravascular brachytherapy.

RICHARD SANCHEZ, Adjunct Professor
Associate Director, Commissariat à l'Energie Atomique (CEA), Saclay, France
Ph.D., University of Paris, France, 1979
Ph.D., University of Washington
Descriptors: Transport in stochastic media, direct and inverse methods in reactor physics

RESEARCH FACULTY

JOHN MANDREKAS, Senior Research Scientist
Ph.D., University of Illinois, 1987
Descriptors: Plasma physics, transport theory, fusion reactor design, numerical methods, and computational physics

DENNIS SADOWSKI, Research Engineer II
M.S., University of Illinois at Chicago, 1986
Descriptors: Thermal sciences, fluid dynamics, and design and construction of experimental equipment

EMERITUS FACULTY

Melvin W. Carter, started in 1972, retired in 1988
Member of the National Academy of Engineering
Joseph D. Clement, started in 1965, retired in 1991
Monte V. Davis, started in 1973, retired in 1987
Geoffrey G. Eichholz, started in 1963, retired in 1988
Bernd Kahn, started in 1974, retired in 1996
Ratib Karam, started in 1972, retired in 1997
Alfred Schneider, started in 1975, retired in 1990

STAFF

Shauna Bennett-Boyd, Administrative Assistant II
Germina Ilas, Coordinator of Student Recruiting and Advising and Postdoctoral Fellow
Ph.D., Georgia Institute of Technology, 2002
Geoffrey G. Eichholz, Regents' Professor Emeritus, was awarded the 2004 Robley D. Evans Commemorative Medal by the Health Physics Society. This award is given in memory and honor of Professor Evans in recognition of his outstanding and extraordinary dedication and contributions to radiation safety as physics educator, scientist, author, and humanitarian for more than fifty years. The recipient of this award demonstrates excellence in scientific achievement, interdisciplinary capabilities, the applicability of science to real-world needs of radiation protection, and insight into simple solutions of difficult problems, as well as other exceptional qualities and accomplishments demonstrated by Professor Evans.
Frank H. Neely Nuclear Research Center
- Opened in 1963
- Nuclear and Radiological Engineering/Medical Physics program is housed here
- Research groups: Fission, Fusion, and Medical Physics

Fusion Research Center
Director, Weston Stacey
Work is performed on plasma and neutral particle transport, fusion neutron source applications, next-step tokamak design analysis, and the transmutation of spent nuclear fuel.

Neely Research Center
Director, Nolan Hertel
High dose rate irradiation, instrumentation testing, Co-60 sterilization, MCNP computer modeling, radiation transport and neutron measurements.
Seminars that discuss new developments in nuclear and radiological engineering and medical physics are presented by well-known speakers. Speakers come from academia, industry, and governmental and professional organizations and represent various areas in the disciplines. Graduate students are encouraged to attend these seminars to fulfill the requirements for NRE 8011-2. What follows is a list of speakers from the 2003-2004 academic year.

Madeline Feltus, Department of Energy, Overview of the DOE Advanced Gas Reactor Fuel Development and Qualification Program and Gas Reactor R&D;

George Flanagan, Oak Ridge National Laboratory, Nuclear Safety Challenges Associated with Launching a Fission Reactor into Space, What Has Changed Since 1965;

Ken Folk, Southern Nuclear Company, Recent Experience with Hatch Fuel Leakers;

Timothy Fox, Emory University, Computer-Aided Optimization Applied to Radiation Therapy Treatment Planning;

Barry Ganapol, University of Arizona, Why Study Things Analytical in Nuclear Engineering and Radiological Science?;

Hans Gougar, Idaho National Engineering and Environmental Laboratory, Core Design and Physics Analysis of Pebble Bed Reactors MPBR;

E. A. Hoffman, Argonne National Laboratory, GEN-IV Reactor Studies;

Rebecca Howell, Emory University, Clinical Medical Physics;

Susan Hoxie-Key, Southern Nuclear Operating Company, Axial Offset Anomaly in High-Duty PWR’s;

Dale E. Klein, Assistant to the Secretary of Defense for Nuclear, Chemical and Biological Defense Programs, Weapons of Mass Destruction: Policy vs. Reality;

Drew E. Kornreich, Los Alamos National Laboratory, Some Official and Bootlegged Nuclear Engineering at Los Alamos;

James A. Lake, U.S. DOD Idaho National Engineering and Environmental Laboratory, Nuclear Energy's Role in Responding to the Energy Challenges of the 21st Century;

D. Petti, Idaho National Engineering and Environmental Laboratory, Radiation-Resistant Carbide Fuel Pellets;

Thomas G. Ruckdeschel, Alliance Medical Physics, Medical Physics as a Career;

Richard Sanchez, CEA France, Homogenization Techniques for Core Calculations;

Mark Symons, Precision Therapy, Inc., Radiation Therapy and Medical Physics;

M. R. Wade, Oak Ridge National Laboratory, Tokamak Fusion Research at DIII-D; and

K. Ziver, Imperial College, Nuclear Fuel Management Optimization.
The annual meeting of the Woodruff School's advisory board was held at Georgia Tech on October 17, 2003. School Chair Dr. Ward O. Winer reviewed the State of the Woodruff School and Dr. Farzad Rahnema, Chair of the NRE/MP program, did the same for the NRE/MP program. Because it had been five years since Georgia Tech converted its curricula from quarters to semesters, the main topic facing the board was to review the nuclear and radiological engineering degree requirements, courses of study, and the educational objectives and outcomes under the current curricula. Dr. Narl Davidson, Associate Dean of Engineering, gave a report detailing the activities of the College of Engineering. After lunch, the NRE group discussed the strategic plan and the progress that had been made in Nuclear and Radiological Engineering. Ms. Ann Winters gave a presentation about the National Academy for Nuclear Training Educational Assistance Program.

The Nuclear Engineering Advisory Board of the Woodruff School has representatives from academia, industry, and the national laboratories. These board members also belong to the Woodruff School Advisory Board. They meet once a year, in the fall, to discuss new ideas for the NRE/MP program and areas of research that are important to industry and academia.

Mr. Jeffrey A. Benjamin  
Vice President, Licensing & Regulation  
Exelon Corporation  
Warrenville, Illinois

Mr. Louis B. Long  
Vice President, Technical Support  
Southern Nuclear Operating Company  
Birmingham, Alabama

Mr. David A. Christian  
Senior Vice President and Chief Nuclear Officer  
Dominion Energy  
Glen Allen, Virginia

Mr. James Maddox  
Acting Vice President of Engineering & Technical Services  
Tennessee Valley Authority  
Chattanooga, Tennessee

Dr. Thomas A. Coleman  
Vice President  
Framatome-ANP  
Lynchburg, Virginia

Dr. Bill McCollum, Jr.  
Senior Vice President  
Duke Power Company  
Charlotte, North Carolina
1957
Frank Neely helps Georgia Tech get one of the first nuclear reactors in the South. The Georgia Legislature grants Tech $2.5 million for a nuclear reactor. The cost for the entire complex was 4.5 million dollars.

1958
The first master's degree in Applied Nuclear Science (an interdisciplinary program in physics, chemistry and math) is granted. This later became the health physics degree.

1960
The Board of Regents names the research facility that contains the reactor the Frank H. Neely Nuclear Research Center.

1961
A 30kCi Cesium 137 source is installed in the Radioisotope Facility (later the Cherry-Emerson Building).

1962
The School of Nuclear Engineering is established with the M.S.N.E. as its first degree. The first director of the School of Nuclear Engineering is named: Dr. W. B. Harrison, a professor of mechanical engineering.

1963
Dr. Geoffrey Eichholz is the first faculty member hired in the School of Nuclear Engineering. He retired in November 1988 as a Regents' Professor.

1964
The heavy-water-cooled nuclear reactor begins operations. The Ph.D. in nuclear engineering is approved. Reactor physics is taught by a faculty member at the Oak Ridge National Laboratory over a phone line and with a stylus printer, making it, perhaps, the first distance-learning course at Georgia Tech.

1965
The first Ph.D. in nuclear engineering is awarded to Walter Waverly Graham. The curriculum option of health physics within the MSNE program is initiated. Captain F. W. (Bill) Chambers, Jr. is hired as the first health physics faculty member.

1967
The undergraduate program in Nuclear Engineering is established.

Late 1960s
The Department of Nuclear Engineering is one of the largest producers of Ph.D.'s on campus.

1972
The first master's degree in nuclear engineering is awarded to a minority student. The Board of Regents approves the conversion of the master's degree in applied nuclear science to be conferred on health physics students in the nuclear engineering department. This will be called the M.S. in Health Physics.

1973
The bachelor's degree in nuclear engineer is approved.

1975
The master’s degree in nuclear engineering is accredited. The first master’s degree in nuclear engineering is awarded to a female student.

Mid-1970s
Tech is one of the first undergraduate programs in nuclear engineering to be accredited. Materials fuel technology and reactor operations become options in nuclear engineering in an effort to broaden the curriculum.

1977
The Center of Radiological Research is formed to coordinate research in health physics. The distance-learning (video) program in health physics (M.S.H.P.) and nuclear engineering (M.S.N.E.) is started. Dr. Weston M. Stacey comes to Tech to set up the Fusion Research Center in the School of Nuclear Engineering. The Center of Radiological Research was formed to coordinate research in health physics.

1979
The School of Nuclear Engineering is renamed the School of Nuclear Engineering and Health Physics.

Late 1970s
Tech has the largest graduate health physics program in the country.

1980
The large Cobalt 60 source from the Department of Energy is installed in the Neely Center.

1981
The first Ph.D. in nuclear engineering is awarded to a minority student.

1984
The first Ph.D. in nuclear engineering (HP) is awarded to a woman. The School of Nuclear Engineering is merged into the George W. Woodruff School of Mechanical Engineering.

1985
Tech decides to maintain its nuclear engineering program during a period of downturn because nuclear power and security are important to the economies of the southeast and the nation.

Late 1980s
Tech still has one of the largest health physics programs in the country.

1990
The 30kCi Cesium 137 source in the Radioisotope Building is removed.

1995
The nuclear reactor is shut down.

1997
The B.S.N.E. degree becomes the B.S.N.R.E. degree to reflect the addition of radiological engineering courses in the curriculum.
1999 Decommissioning the nuclear reactor begins. Neely Professor Emeritus of Nuclear Engineering and Health Physics Melvin W. Carter is elected a member of the National Academy of Engineering. The undergraduate nuclear engineering scholarship program begins.

2000 The Nuclear and Radiological Engineering Program joins the Academic Common Market for the undergraduate students wishing to get a BSNRE.

2002 Decommissioning the nuclear reactor is completed. Georgia Tech receives an award from the State of Georgia for engineering excellence for the completion of the decommissioning of the Georgia Tech Research Reactor. A Strategic Plan is developed by the faculty for the nuclear and radiological engineering/health physics program. The NRE/HP program becomes an autonomous unit in the Woodruff School. A period of program growth that includes the addition of faculty and an increase in the number of undergraduate students enrolled in the program. A Woodruff School Associate Chair is appointed for the program. The first Annual Report for the NRE program is published.

2003 A new faculty member is hired as a full professor in partial fulfillment of the strategic plan. A master's degree (M. S.M.P.) in medical physics in conjunction with Emory University is proposed and is waiting for Board of Regents approval. No new graduate students were accepted into the Health Physics program. Self-selected research areas are created: fusion, fission, and health physics. ABET approval of the undergraduate program. Nuclear Engineering and Health Physics at Georgia Tech (1958-1990) by Geoffrey Eichholz, Regent's Professor Emeritus, is published. The Master's Degree in Medical Physics receives approval from the Board of Regents. A transition plan is developed for health physics students to complete the degree.

2004 Students are admitted to the Medical Physics program, which begins in fall 2004. The distance-learning program in Medical Physics begins. The name of the program is changed from Nuclear and Radiological Engineering/Health Physics Program to the Nuclear and Radiological Engineering/Medical Physics Program. Enrollment in NRE continues to rise. The undergraduate program in nuclear and radiological engineering is ranked 11th in the nation by U. S. News & World Report.