DuPont's $23-million gift largest in university's history

By Liz Crumbley

A $23 million gift-in-kind announced by DuPont is the largest single donation ever received by Virginia Tech and will aid the university’s researchers in developing recyclable automotive parts, low-cost aircraft parts, and composite bridge beams.

The gift, consisting of several thermoplastic-composites technology patents and related materials and equipment, will be used by the university for commercial licensing as well as research applications. Virginia Tech competed with several other research universities for the gift, which is one of the most valuable of its kind ever made by an industry to a single institution.

Michael Martin, executive vice-president of Virginia Tech Intellectual Properties (VTIP), Inc., said the $23-million evaluation is based on DuPont’s projection of using the patented technology in a variety of markets, including automotive and electrical cabinetry.

“Virginia Tech’s material scientists and intellectual property developers believe it has even broader applications,” said Martin, who is chairman of the Composites Manufacturing Association within the Society of Manufacturing Engineers. “The technology being donated by DuPont also has the potential for use in bridge decks and other infrastructure applications, and in aircraft construction.”

Production assets from the patents will be used to help establish the Random Wetlay and Continuous Rollforming Composites Labora-
tory, under the direction of Donald G. Baird, professor and eminent scholar of chemical engineering, and Alfred C. Loos, professor of engineering science and mechanics and materials science and engineering. The new lab will be affiliated with the Center for Composite Materials and Structures, co-directed by Baird and Loos, and with the Center for High Performance Adhesives and Composites, directed by James E. McGrath, university distinguished professor of chemistry.

Baird explained that the random wetlay process patented by DuPont is used to make thermoplastic-composite porous mats, consisting of a random mixture of polymer and reinforcing fibers. In DuPont’s process, which is based on paper-making technology, glass or other reinforcing fibers and thermoplastic fibers are chopped up and dispersed in a random mixture in water. This creates a slurry that is cast onto a moving screen and then dried, leaving a mat of thermoplastic and reinforcing fibers that can be formed into composite sheets and molded into items such as car parts.

VTIP will market and license these patented technologies to businesses and industries that wish to use them to improve their products and processes, Martin said.

Meanwhile, Virginia Tech researchers will use the patented processes and materials as a basis for developing advanced random wetlay technology. Along with the patents, (See DUPONT’S on 8)
Virginia Tech faculty and staff members and students are often the subject of significant national and state-wide news coverage. To better inform the university community about these accomplishments, the Office of University Relations has compiled this monthly report. This report includes coverage in the Roanoke news-media market. For more information about the articles mentioned, call Julie Kane, university public relations coordinator, at 1-9934, or contact your college public relations office.

RF Design (October 1998): The national magazine for radio-frequency industries featured “A moment with Theodore S. Rappaport,” outlining the career of the founding director of Tech’s Mobile & Portable Radio Research Group (MPRG). Rappaport’s views on smart-antenna technology was the subject of the cover article of the October 12 issue of Mobile Phone News. Rappaport and his MPRG colleagues are developing antenna systems that will reduce interference in wireless-communications transmissions.

ABC Radio (November 13): Professor of History William Ochsenwald discussed Saddam Hussein’s latest attempts to prevent UN weapons inspectors from looking for chemical and biological weapons.

Richmond Times-Dispatch (November 18): This issue included an article about the State Council of Higher Education’s approval of Virginia Tech’s plan to establish the state’s first graduate degree program in computer engineering. The new program was developed by the Department of Electrical and Computer Engineering.

“With Good Reason” Virginia Public Radio (week of December 7): Professor of Geography Bonham Richardson looked at the history of the Caribbean. “With Good Reason” is a half-hour public-affairs program carried on a dozen Virginia public-radio stations.

“With Good Reason” Virginia Public Radio (week of December 21): Professor of English Lucinda Roy discussed the art of writing. (Repeat of an earlier program)

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(Atlanta) Canadian Broadcasting Corporation: live interview on the Nancy Wood show on Clinton’s video testimony.

(Savanna, Georgia) WBMQ-AM (September 24): Don Scott Show, live interview on Clinton scandal.

WBMQ-AM (October 1): Don Scott Show, live interview and listener call-in discussion on Clinton scandal.

Lynchburg News (September/October 29): interview comments on 6th district congressional race.

The Christian Science Monitor (November 18): Starr finally enters the chamber,” by Peter Grier, interview comments on potential impact of Starr’s impeachment testimony.

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Choices and Challenges forum looks at genetic engineering

By Kirsten Worley

Can humans redesign themselves? What are the qualities that define us as humans, and is it desirable—or acceptable—to change them? Are there limits to what should be attempted? How do we decide?

The Choices and Challenges Project will present a public forum on Reinventing the Human Thursday, March 25, from 8 a.m.—4 p.m. at the Donaldson Brown Hotel and Conference Center. The program will offer social, cultural, political, ethical, and economic perspectives to help the community make decisions now that will affect life in the future. All programs are open to public at no charge. Registration is recommended (although not required).

The recent media focus on cloning animals has alerted the general public to the rapid pace of work now taking place in human genetic and reproductive technologies. New genetic-engineering procedures now permit human genes to be identified and traced in ways that are developing these procedures to cure disorders and correct serious childhood health problems. But the techniques could also be used, before developing these procedures to cure disorders and ethical dimensions of science and technology. Topics covered range from genetic engineering revolution, DNA, Genes, and Genetic Engineering, by Gordon R. Carter and Stephen M. Boyle, is a 146-page text liberally illustrated with photos and diagrams, and it was conceived to de-mystify the world within.

Carter, a veterinary microbiologist who serves as a professor emeritus in the college, and Boyle a molecular bacteriologist working in the Center for Molecular Medicine and Infectious Diseases, decided to write the book as an easy to use primer for students and others interested in understanding more about a technology that is changing the world.

Vast amounts of technical information have been condensed into core essentials which are presented in a simple and understandable summary form. The book has been written so that readers with only a basic understanding of chemistry and biology should be comfortable with material presented, according to Boyle and Carter.

The book contains a useful glossary as well as a timeline of scientific milestones in genetics and related areas.

Book examines building blocks of life

By Jeffrey S. Douglas

Words like cloning, DNA and genetic engineering have become a part of the modern popular lexicon. For many, they remain puzzling and abstract concepts related to mysterious processes that occur at the molecular levels of life.

Now, two professors in the Virginia-Maryland Regional College of Veterinary Medicine have authored a text which offers a fairly simple, straightforward explanation of the terms and processes that are part of the biotechnology revolution.

The book, DNA, Genes, and Genetic Engineering, by Gordon R. Carter and Stephen M. Boyle, is a 146-page text liberally illustrated with photos and diagrams, and it was conceived to de-mystify the world within.

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Business, engineering graduates most popular

By Sookhan Ho

Business and engineering majors were the most popular students among employers recruiting at Virginia Tech last fall semester. Career Services Director Jim Malone said the top 10 programs (in numbers of interviews) are all business and engineering majors, except for computer-science applications (a graduate program in Arts and Sciences). The 10 are: management science and information technology (decision sciences option)—1,431; interviewing conducted, 161 students participating; computer engineering—1,090 interviews, 120 students; mechanical engineering—1,077 interviews, 126 students; finance—787 interviews, 117 students; computer engineering—744 interviews, 72 students; industrial and systems engineering—701 interviews, 94 students; computer-science applications—669 interviews, 41 students; chemical engineering—581 interviews, 56 students; marketing—556 interviews, 96 students; accounting—487 interviews, 70 students.

Programs that also drew considerable numbers of interviews were computer science, accounting information systems, management, and civil engineering.

The number-one ranking of the decision sciences option in the management science and information technology major can be attributed in part to the continued high demand for information-technology graduates. Malone said such programs as computer science and management-science majors, like most other business majors, tend to have lighter in activity, fall semester has become the primary recruiting sea- mon number of job opportunities for the class of '99. Last year, employers projected a 19-percent increase.

But the survey found that about 55 percent of employers plan to hire even more new graduates by the end of the '98-'99 academic year than they did last year. More than one-third plan to maintain the hiring levels they achieved last year. Only 8 percent said they will cut back.

At Virginia Tech, 497 organizations recruited on campus last fall semester, up 22 percent from a year ago, Malone said. They conducted 11, 576 interviews, up 12 percent from a year ago.

Employers will be recruiting in Squires for a few weeks this spring, which "promises to be lighter in activity," Malone said. Fall semester has become the primary recruiting sea- on for employers, he said—"we already have several dates filled for next fall."
**Activities**

**Events**

Thursday, 11

YMCA Slide Show, noon, Cranwell Center: "Adventures with the Virginia Tech Women’s Whitewater Club," by Liz Ritchie and Beth Thomas.


Friday, 12

International Club Coffee Hour, 5 p.m., Cranwell Center: “Endangered Species Conservation: Madagascar Fish Eagle,” by James Fraser.

Women’s Basketball, 7 p.m.: At Massachusetts.

Student Recital, 8 p.m., Squires Recital Salon: Noriko Okabe.

Saturday, 13

Men’s Basketball, 2 p.m.: At Fordham.

Black History Month Program: 7 p.m., Black Cultural Center, Squires: Discussion and reading of selected writings of April Turner.

Student Recital, 8 p.m., Squires Recital Salon: Jeff Crouse.

Sunday, 14

YMCA Hike, 1:30 p.m., meet in parking lot 403 Washington, St.: Cascades.

Women’s Basketball, noon: At Rhode Island.

Student Recital, 3 p.m., Squires Recital Salon: Marcy Pell and Craig Zamer.

Student Recital, 8 p.m., Squires Recital Salon: Riley Pugh.

Monday, 15

Presidents’ Day Holiday for Staff.

Multicultural Display Opening, 11 a.m., Squires Multicultural Center: “Highlighting Jewish Heritage.”

Faculty Development Workshop, 3-5 p.m., NMC, Newman Library: “Introduction to Streaming Audio and Video.”

University Council, 3:35 p.m., 1045 Pamplin.

Black History Month Program: 7 p.m., Black Cultural Center, Squires: "Christiansburg Institute, an Educational Legacy.”

VTU Program, 7:30 p.m., Burruss auditorium: Me and My Girl.

Tuesday, 16

Salary and Wage Paydate.

Bloodmobile, 10 a.m.-4 p.m., Squires.

Faculty Development Workshop, 10 a.m.-noon, NMC, Newman Library: “Adobe PageMaker, Part 2.”


Black History Month Program: 7 p.m., Lyric Theatre: “Improvisations: A Vision of the Community.”

Faculty Senate Meeting, 7 p.m. 32 Pamplin.

Men’s Basketball, 7 p.m., Cassell Coliseum: Temple.

Special Music Concert, 7 p.m., Squires Recital Salon: Audubon Quartet/Black History/Poetry/Dance.

Wednesday, 17

Bloodmobile, 10 a.m.-4 p.m., Squires.

YMCA Mornings, 9:30-11:30 a.m., Luther Memorial Church: "Face and Skin Care.”

Family Support Program, noon-1 p.m., DBHCC Conference Room A: “Teenage Tangle: Grooming the Parent Child Relationship.”

Organization of Women Faculty Luncheon, noon, DBHCC Dining Room.

Multicultural Program, 1-3:30 p.m., Squires Multicultural Center: Monthly Book Club.

Faculty Development Workshop, 3-5 p.m., NMC, Newman Library: “Creating a Web-Based Course Using CourseInfo.”


Thursday, 18

Bloodmobile, 10 a.m.-4 p.m., Squires.

YMCA Slide Show, noon, Cranwell Center: “A Two-Week Bike Trip to Southern China.,” by Dave Jenkins.

Staff Senate Meeting, 5:30 p.m., 1810 Litton Reaves.

Black History Month Program: 7 p.m., Black Cultural Center, Squires: Discussion/Forum.

Women’s Basketball, 7 p.m.: At La Salle.

**Seminars**

Thursday, 11

Statistics, 3:45 p.m., 409 Hutcheson: Jin-Ting Zhang.

Entomology, 4 p.m., 220 Price: “Western Corn Rootworm Biology and Pest Management in Virginia,” by Roger Youngman.

Geological Sciences, 4 p.m., 2044 Derring: "Tidal Rhythmites: What Are They, and What Do They Tell Us?" by Ken Eriksson.

Friday, 12

MCBB, noon, 102 Fralin: “Role of ICE family of Caspases in IL-1 Activation and in Apoptosis,” by Douglas Miller, Merk Labs.


Monday, 15

CSES, 4 p.m., 232 Smyth: "Wheat Chromosome Engineering and Breeding,” by Jianli Chen.

Horticulture, 4 p.m., 409 Saunders: “Program Development and Evaluation,” by Lex Bruce.

Tuesday, 16

Computer Science, 4 p.m., 105 Williams: “CSCS—Computer-Supported Collaborative Reflection,” by Mark Guzdial, Georgia Tech.

Wednesday, 17

Science and Technology Studies Center, 4-5:30 p.m., 132 Lane: “The Triumph of the Pedigree: Sir Francis Galton and the Birth of Eugenics,” by Nicholas Gillham, Duke.

Thursday, 18


Entomology, 4 p.m., 220 Price: “A Cryptic Tour of Carbonates Form the Poles to the Tropics, Australia and New Zealand,” by Fred Reed.

**Bulleted Events**

**Museum continues Saturday Science**

The Virginia Tech Museum of Natural History will continue its "Saturday Science" for children and their parents on Saturday, Feb. 27, from 11 a.m.-noon at the museum, 428 N. Main St. Activity is centered around the theme, “Winter—A Unique Season.” Saturday Science is free; however, pre-registration is required. Call 1-3001 to pre-register.

OWF lunch announced

On Wednesday, Feb. 3, the Organization of Women Faculty will hold a lunch from noon-1 p.m. in the Donaldson Brown Conference Center Dining Room. For information, call 1-8163 or callihan@vt.edu.

PBD induction details set

The Gamma Omega Chapter of Phi Beta Delta (PBD), the Honor Society for International Scholars, will be holding its third annual induction ceremony on Tuesday, Feb. 23. PBD recognizes faculty members and students with past and continuing activities and achievements in the international arena. The ceremony for new members will be held in the Squires Brush Mountain Room at 6:30 p.m., followed by a reception at 7:15 p.m. There will be a presentation by Philip Huang, professor of management science and information technology in the Pamplin College of Business, titled “A Personal View of U.S.—China Relations.” The presentation begins at 8 p.m. and is open to the public.

**Christiansburg Institute subject of TV Show**

The Christiansburg Institute (CI) is the topic of Blue Ridge Nightline on Blue Ridge Public Television Sunday, Feb. 14, at 3:30 p.m.

Christiansburg Institute was open from 1866 to 1966 and was the first high school for black students in Southwest Virginia. The program will discuss the history of Christiansburg Institute, plans and current efforts on behalf of Virginia Tech students to enlist community input and support for the restoration of the campus.

Guests on the program include Elaine Carter, Lewis Perry, and Rachel Parker-Gwin. Service-Learning students in Parker-Gwin’s classes have been leading community focus groups for the Christiansburg Institute Community Learning Center.
Cardiac Rehabilitation Week open house scheduled

By Jean Elliott

The Therapeutic Exercise and Community Health (TECH) Center at Virginia Tech and the National Cardiac Rehabilitation Exercise Week (February 7-13) with a special open house designed to increase awareness in health, nutrition, fitness and of the exercise programs available to residents of the New River Valley.

On Friday, February 12, the TECH Center will showcase its offerings with an open house at its location at War Memorial Hall from 7 to 8:30 a.m. The open house is an opportunity to learn more about the center’s supervised exercise programs and risk-factor-reduction services. Participants will also have access to free blood-pressure screenings, activity-level assessment, and may discuss any exercise or nutritional concerns with the professional staff. A continental breakfast will be served. Call 1-7277 for information.

Those arriving close to 7 a.m. will have an opportunity to view all of the various programs in action. For 22 years, the center (formally called the Cardiac Therapy and Intervention Center) has helped local individuals improve their cardiovascular health and reduce their risk of heart attack and other physical problems. It is a non-profit community service that is open to all residents of the New River Valley. It is operated through the College of Human Resources and Education’s exercise physiology program, in conjunction with the Human Performance Laboratory.
The following classified positions are currently available. More details of these positions, specific application procedures and position-closing dates may be found on the Personnel Services web site at http://www.ps.vt.edu. Available positions are also listed on the Job Line, a 24-hour recorded message service; Office/Clerical: 1-6196; Technical/Research: 1-6160; Service/Trades: 1-6176; Professional and Managerial: 1-4649; Information Technology: 1-2233. Some of the following positions include state benefits. Positions with numbers beginning with “W” are hourly and do not include state benefits. Comments about this shortened listing should be made to persers@vt.edu or by calling 1-5301 or 1-6258 for persons with hearing impairments. Individuals with disabilities desiring assistance or accommodation in the application process should call by the application deadline.

To better serve applicants, the closing date for advertised positions has been changed to 1 p.m. Monday unless otherwise stated. An EO/AA employer committed to diversity.

FULL TIME
Laboratory Specialist Advanced, Food Science and Technology, 6375M.
Installation and Repair Tech, Senior, Video/ Broadcast Services, 7286D.
Programmer, Administrative Information Systems, 7405D.
Executive Secretary, University Development, 2226D.
Programmer/Analyst, Administrative Information Systems, 6824D.
Housekeeping Worker, Donaldson Brown Hotel and Conference Center, 7299G.
Laboratory Specialist Senior, Environmental Health and Safety Services, 2756T.
Occupational Safety Compliance Officer, Environmental Health and Safety Services, 6571T.
Housekeeping Worker, Residential and Dining Programs, 721H.
Housekeeping Worker, Physical Plant, 7323P.
Distance Learning Specialist, Office of Distance Education, 7413D.
Food Operations Manager A/Sous Chef, Residential and Dining Programs/Dietetic Dining Hall, 7266H.
Fiscal Assistant, Residential and Dining Programs/Business Services, 2224H.
Programmer/Analyst, Information Systems, 7246D.
Computer Systems Engineer, Communications Network Services, 7414D.
Food Operations Assistant B (3rd Baker), Residential and Dining Programs/Southgate Bakeshop, 2968H.
Food Production Worker A (2nd Cook), Residential and Dining Programs/Owens Dining Center, W022480H.
Research Specialist, Crop and Soil Environmental Sciences, 7412M.
Instructional Technology Systems Manager, Educational Technologies, 2122D.

EMPLOYMENT

CLASSIFIED POSITIONS

Locksmith, Physical Plant, 218P.
Painter, Physical Plant, 7417P.
Trades/Utilities Master Mechanic, Hampton Roads Agricultural and Research Extension Center, 4104M.
Administrative Liaison, Communications Network Services, 2325D.
Office Services Assistant, Human Nutrition Food and Exercise, 6644D.
Laboratory Mechanic A, Materials Science and Engineering, 7419J.
Program Support Technician Senior, Internal Audit, 2080T.
Research Specialist Senior, Fisheries and Wildlife Sciences, 7422M.
Computer Systems Engineer, Engineering Science and Mechanics, 6549J.
Enrollment Services Coordinator, Northern Virginia Center, 2094J.
Laboratory Specialist Senior, College of Veterinary Medicine, 7423M.
Senior Programmer Analyst, Institutional Research, 7421G.
Office Services Specialist, Communication Network Services, 802W.
Nutritionist (Deet’s Place Manager), Residential and Dining Programs/Deet’s Place, U938H.
Plumber Steamfitter, Physical Plant, 1926P.
Programmer, Administrative Information Systems, 6772D.
Senior Programmer/analyst, Administrative Information Systems, 7328D.
Housekeeping Worker, Residential and Dining Programs, 1076H.
Office Services Specialist, Aerospace and Ocean Engineering, 7237J.
TV Production Specialist, Athletics, LC054J.

PART TIME
Food Operations Assistant A, Residential and Dining Programs, W022314H.
Food Operations Assistant B, Residential and Dining Programs, W022315H.
Housekeeping Worker, Residential and Dining Programs, W022490H.
Program Support Technician Senior, Administrative Information Systems, W022490D.
Program Support Technician Senior, Administrative Information Systems, W022069D.
Food Operations Assistant B/3rd Cook, Residential and Dining Programs/Personal Touch Catering, W022562H.
Programmer, Communications Network Services, W022054D.
Laboratory Aide, College of Veterinary Medicine, W020811M.
Program Support Technician, Research and Graduate Studies, 7413J.
Electronic Technician Senior, Engineering Science and Mechanics, W022588J.

Accountant, Electrical Engineering, W022399J.
Office Services Assistant, Residential and Dining Programs/Facilities and Services, W022590H.
Health Educator Senior, Continuing Education, W022595G.
Animal Care Technician B, Veterinary Teaching Hospital, W022190M.
Housekeeping Worker, Schollfert Health Center, W020214G.
Office Services Assistant (Switchboard Operator), Communications Network Services, W022101D.
Fiscal Technician, Veterinary Teaching Hospital, W020810D.
Food Operations Assistant (Dishwasher), Donaldson Brown Hotel and Conference Center, W022603G.
Food Production Worker A, Child Development Lab, W022604J.
Office Services Specialist, University Registrar, W022413T.
Start/Stop/Shop Attendant, Golf Course, W020799G.
Programmer, Controller, W022605P.
Programmer, Administrative Information Systems, W022606M.
Computer Operations Technician, Computing Center, W022608D.
Pharmacy Supervisor, Veterinary Teaching Hospital, W022501M.
Switchboard Operator (Off-Services Assistant), Veterinary Medicine, W020821M.
Laboratory Technician, Plant Pathology, Physiology and Weed Science, W022612M.
Get Connected Technician, Administrative Information Systems, W022615D.
Office Services Assistant, Veterinary Teaching Hospital, W022260S.
Enrollment SVCS Assistant (Academic Adviser), Computer Science, W022613T.
Program Supt Tech (Visual Resources Curator), Art and Art History, W022616T.
Trades Helper/Carpenter’s Assistant, Residential and Dining Programs/Facilities, W020219H.
Program Support Technician, Horticulture, W022617M.
Cashier/Hostess/Dining Room Supervisor, Donaldson Brown Hotel and Conference Center, W022614G.
Office Services Aide, Hospitality and Tourism, W022618J.

UNIVERSITY ONLY
Nutritionist (Deet’s Place Manager) Residential and Dining Programs/Dietetics, U938H.
OFF CAMPUS
Office Of Distance Education, 7410D.
Hampton Roads Agricultural and Research Extension Center, 4104M.
Human Nutrition Food and Exercise, 6641J.
Fisheries and Wildlife Sciences, 7422M.
Northern Virginia Center, 2094J.

INSTRUCTIONAL

Department of Marketing, Assistant Professor. Candidates must have completed, or be in the final stages of completing, a doctorate in marketing or a related field. The department is particularly interested in receiving applications from candidates whose doctoral work is in areas such as cognitive, social, quantitative, or decision-making psychology and behavioral or experimental economics whose work would relate to issues in marketing and consumer behavior. Applications will be reviewed on the basis of the candidate’s potential to excel in both research and teaching. The anticipated date of appointment is Aug. 15, 1999. The search will remain open until the position is filled. Inquiries and applications should be directed to Kent Nakamoto, Dept. of Marketing (0236), Virginia Tech, Blacksburg VA 24061; 1-4878; e-mail nakamoto@vt.edu.

NON-INSTRUCTIONAL

Mobile and Portable Radio Research Group (MPRG). Director of Information Services, MPRG, rapidly growing research laboratory of the Bradley Department of Electrical and Computer Engineering with efforts focused in the field of wireless communications, invites applications for the above position at the rank of research associate. Duties will include (1) system administration for a network of 20 Sun workstations, networked printers, and a growing number (50+) of Windows NT workstations, (2) purchasing, installation, and maintenance of computing equipment and software (3) technical support of electronic publications database and web site, (4) supervision of a team of students to provide user support for research and teaching activities of the laboratory, (5) long-term planning for growth of laboratories computing facilities. Expected qualifications include: (1) a B.S. degree in computer science, computer engineering, or a related field, (2) strong knowledge of Unix and NT system administration, (3) knowledge of HTML, C, C++, Ether, Unix, Solaris 2.6, Windows 95/98, Windows NT Workstation and Server 4.0, (4) excellent work habits and interpersonal communication skills. Qualified applicants should submit a resume and list of three references to B.D. Woerner, director, MPRG (0350), NEB, Virginia Tech, Blacksburg VA 24061. Applications will be accepted until position is filled.

Virginia Cooperative Extension. Director, Southwest Virginia 4-H Center (re-appointment—revised job description). Virginia Cooperative Extension is seeking applications for director, Southwest Virginia 4-H Educational Center (position # FA305). Successful candidate will hold lecturer rank in a non-tenure-track, professional faculty position.
selected nation wide for the $1-million pro- gram. Each school will receive $100,000 to construct its satellite and the Air Force and NASA will take care of the launching costs. Hall said the Tech students will build two basketball-sized satellites, each weighing about five kilograms and containing a computer, power supply, and communications equipment. Orbital Sciences Corp. will provide materials for the satellites. Hall has requested technical assistance for the project from Orbital, the NASA Goddard Space Flight Center, and INTELSAT Corp.

The AOE project was selected for its scientific-and-technology-demonstration potential. Hall said the Tech-built satellites will orbit the earth for a month or more, measuring the effects of ionospheric irregularities, or scintilla- tions, on Global Positioning System (GPS) signals. GPS is used for navigation and locating purposes by NATO, the military, aircraft, as well as by millions of individuals. “Even some weapons are guided by GPS now,” Hall said.

GPS satellites orbit above the ionosphere, the region composed of layers of earth’s atmo- sphere. Hydrogen atoms excited by ultraviolet radiation escape the earth and ionize to form ionized layers to receivers on earth, insta- bilities in the ionosphere cause scintillations in the signals. Problems arise when scintillations cause GPS signals to fade, resulting in errors in navigational signals.

The two Tech satellites will orbit in the ionosphere, taking scintillation measurements that will help scientists and engineers learn how to decrease the effects of irregularities on GPS signals and may add to the body of knowl- edge about radio-wave propagation. Hall said the students will design two satellites working in tandem because the Air Force and NASA are interested in the concept of launching flying clusters of small satellites in future communica- tions programs. That way, if one satellite fails, the others can continue to carry out their mission. Hall is discussing additional forma- tion-flying capabilities with professors at Utah State University and the University of Wash- ington who also have received grants under the NanoSatellite Program.

Another new technology that will be demon- strated by the Virginia Tech project is the use of GlobalStar communications satellites. One of the Tech satellites will have a GlobalStar telephone and will be able to place a call to the university for downloading science data. In addition to Hall, Scales and Stutzman, ECPE faculty members Nathaniel Davis and Jaime De La Ree, who have related research interests, are working with the project.

This spring semester, the original nine AOE seniors—Ivan Acosta, Elbert Adams, Adam Bram, Rafael Castillejo, Brendan McCullers, Kristin Makovec, Michael Powers, Anita Santiago, and Jana Schwartz—have been joined in the project by several other AOE and electrical-and-computer-engineering (ECPE) undergraduates. Most of the original students will graduate this May, said Jaime Acosta, who is joining the Air Force after graduation in May and also wants to work with the space program, said the seniors and un- derclassmen will work this semester to complete the design and get the project ready for the next phase—actually building the satellites.

The project’s satellite will be delivered to the Air Force for testing in November 2000. Later this year, Hall said, the project team will have to create a “clean” facility at Tech—similar to the dust-free facilities in which microchips are produced—for assembling the satellites and the GPS receiver hardware to be carried as payloads.

The College of Engineering has two labo- ratories, the Spacecraft Simulator Laboratory and Satellite Tracking Laboratory, that will be used in constructing and operating the satellites. The satellites from all 10 universities that have won grants in the NanoSatellite Program will be launched from the Space Shuttle in 2001. The AOE and ECPE juniors who are work- ing on the project this semester will help build the satellites during their senior year, Hall said. However, they will have to work on original design projects in addition to the satellites. The best solution? “I think as seniors they’ll design the next generation Virginia Tech research satel- lites,” Hall said.
ISE students gain international experience in France

By Karen Gilbert, ISE public relations coordinator

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The École des Mines de Nantes School of Engineering was created in 1900 by the French Ministry of Industry, and was recently the destination of a group of Virginia Tech Industrial and Systems Engineering (ISE) faculty and students.

Located in Nantes, France, the school was designed as a tool for industrial development by providing high-level teaching and research for select students. Forty percent of the student’s time is spent on-site at industrial locations, which is meant to fully prepare the student for the industrial environment.

One of the founding principles of the École des Mines de Nantes is that engineering skills alone are not sufficient for the engineer of tomorrow. The school’s brochures states: “In a world where frontiers no longer form a barrier to trade, technology, information or the exchange of ideas, it is essential for an engineering school to develop an international profile.”

For this reason, the Industrial and Systems Engineering Department at Virginia Tech and the École des Mines de Nantes have formed a partnership to prepare their engineering students to enter the work force with an international understanding. In January, ISE faculty members John Casali, Brian Kleiner, Subhash Sarin and Joel Nachlas, led four teams of senior ISE students to Nantes, where they had the unique opportunity to work on industrial projects jointly with students from École des Mines de Nantes. The trip for the students was made possible by the Virginia Tech Foundation Scholarship Fund and coordinated through the office of Assistant Dean of Engineering Pamela Kurstedt. The ISE students who made the trip to Nantes, France included Alejandro Rivera, Elise Caruso, Julie Germain, Marc Petratis, Steve Campbell, Doug Newhard, Catalina Rueda, Nehul Bhavsar, Rina Gursahaney, Vineet Harwal, Wendy Willis, Julia Rihotan, Joe Shenk, Scott Neilson, Gail Porter, Nevene Jalal, Ryan Boyle, Rush Blevins, Jack Regler, and Dan Fass.

By working in collaboration with the students from the École des Mines de Nantes, the ISE students discovered another cultural approach to a problem. Four challenges faced the student teams: Redesigning Mining Equipment for Improved Performance and Operational Safety, advised by Casali; Preparing an Operations Recovery Plan, advised by Kleiner; Designing a Plant Layout, advised by Sarin; and a Quality Control Project, advised by Nachlas. The projects given to the student teams are actual problems faced by existing industries, the names of which are kept confidential. An ISE faculty member guided each team as they tackled their specific industrial problem.

The ISE trip to France also included an opportunity for the group to visit the Aerospatiale plant, which is Boeing’s competition here in the United States. The Aerospatiale Group is a major international force in virtually every sector of the aerospace business, from aircraft and helicopters to space and defense systems.