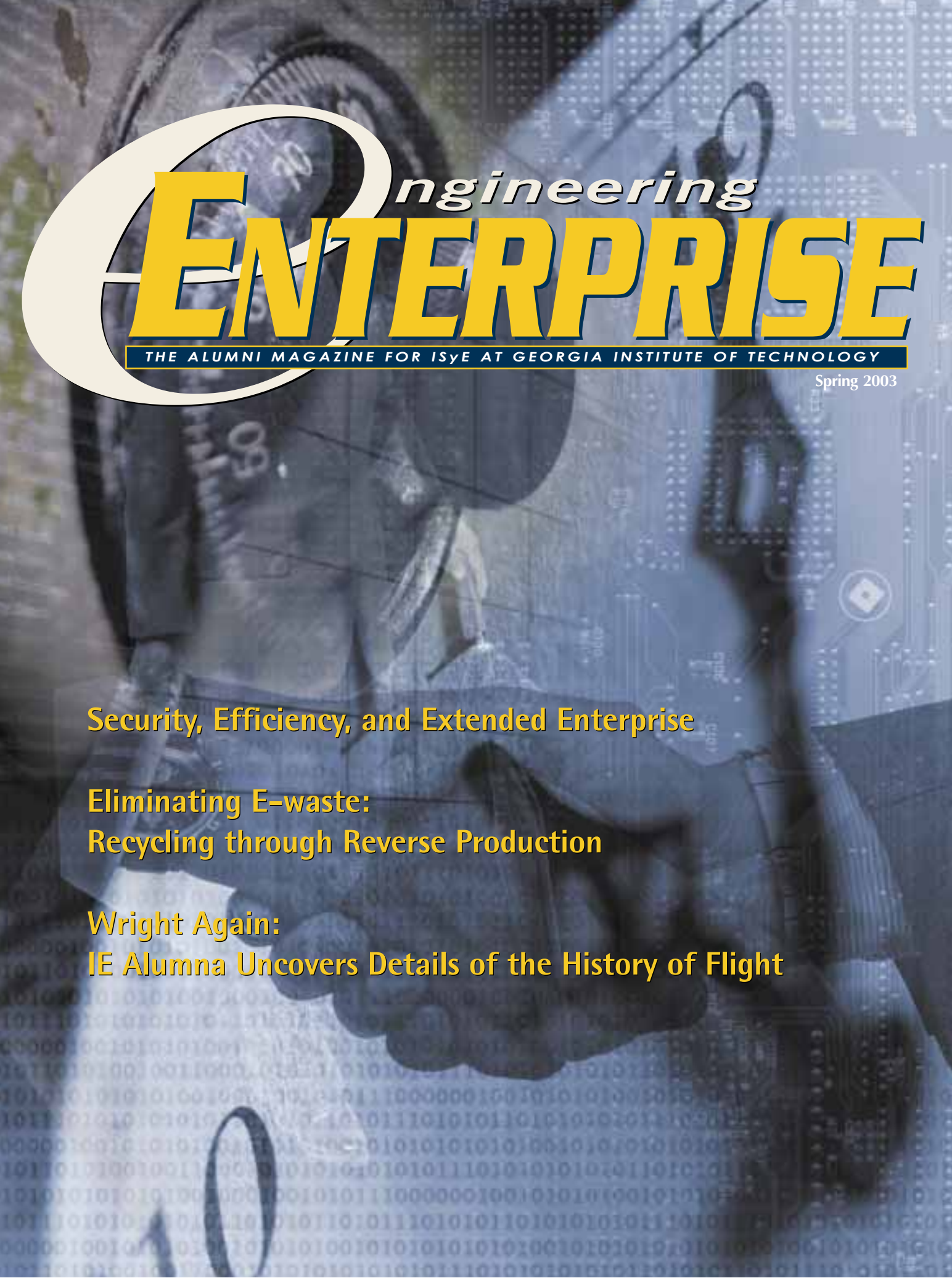




Engineering **ENTERPRISE**

THE ALUMNI MAGAZINE FOR ISyE AT GEORGIA INSTITUTE OF TECHNOLOGY

Spring 2003

Security, Efficiency, and Extended Enterprise

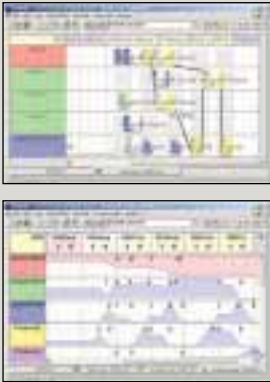
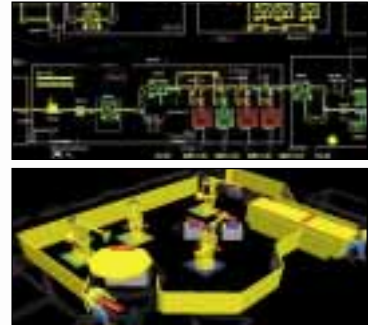
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Wright Again:
IE Alumna Uncovers Details of the History of Flight

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Introducing Engineering Enterprise

by William B. Rouse



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Change is at hand. With this issue, the ISyE newsletter – *IE Connections* – is becoming the ISyE magazine – **Engineering Enterprise**. The key word here is “enterprise.” Education, research, and service in ISyE are not just focused on “industry.” Our domain is the enterprise as a whole – from the shop floor to the Board Room; from businesses to government to non-profits. ISyE concepts, principles, methods, and tools apply broadly to issues ranging from operational management to enterprise strategy.

Early in my tenure as Chair of ISyE – all of 18 months ago – a group of freshmen asked me to explain IE. Thinking quickly, I told them that if they majored in EE, they would devote their attention to voltage and current; if they went to ME, they would worry about velocity and acceleration; in CE, they would deal with stress and strain; in CS, they would concern themselves with bits and bytes. In IE, in contrast, the focus is people and money.

But ISyE is not just IE – it is industrial and systems engineering. Thus, we are focused on wholes more than parts. The whole system typically is the enterprise, for example the company or government agency. Actually, the system is the enterprise acting in markets and amidst constituencies. ISyE students are being prepared to lead such enterprises.

The data on our alumni support this conclusion. More than 25 percent of ISyE’s alumni have senior leadership positions in a wide range of enterprises. Among our alumni, it is easier to find an investment banker than a chief manufacturing engineer; easier to find a software entrepreneur than a process analyst. Many of these people have told me that their ISyE educations – their Georgia Tech educations – have enabled them to gain these leadership positions.

Our new ISyE magazine – **Engineering Enterprise** – is dedicated to informing, supporting, and connecting ISyE leaders in all their endeavors. This magazine, in conjunction with the online Georgia Tech Business Network, will assure that your affiliation with and support of ISyE are key elements in gaining the knowledge, skills, and relationships central to the success you seek.

How does this work if you do not envision yourself to be the leader of an enterprise? My experience is that not all leaders in an enterprise are the leader. ISyE alums in business, government, and non-profits play strong intellectual roles because of their tremendous analytical skills, and because they often are the only technically oriented participants who feel comfortable addressing people and money issues.

Thus, there are a variety of types of enterprises and a variety of kinds of leaders. ISyE alums and friends cover the spectrum. This magazine is devoted to supporting these varieties with the best available knowledge of leading-edge concepts, principles, methods, and tools. We hope to become the best source in these areas. Please let us know how we are doing. 

William B. Rouse is the H. Milton and Carolyn J. Stewart Chair and Professor of the School of Industrial and Systems Engineering at Georgia Institute of Technology.

THE STATE OF THE SCHOOL

Bill Rouse completed his first year as ISyE School chair fall semester by delivering the annual State of the School Address at the Alumni Assembly. Most who attended will agree that ISyE is looking better than ever. Dr. Rouse cited the School's "talent pool" of faculty, staff, students, and alumni as ISyE's greatest assets. "Leading ISyE is like being in charge of an intellectual candy store," he added. Highlights of his speech are listed below:

General Facts

- ISyE continues as the number one graduate and undergraduate industrial engineering program in the country.
- There has been a significant increase in graduate students in the past two years. ISyE is now home to 250 master's students and 200 doctoral candidates, along with 1,200 undergraduates.
- The program now graduates more than 10 percent of the industrial engineering degrees in the country, and we claim 12,000 alumni. An additional 1,000 are added every two plus years.

People

- ISyE now has close to 100 faculty and staff members. One-quarter of the faculty is female, and 2/3 of the junior faculty is female. In addition, half of the student body is now female, and 2/3 of these females are minority.
- Five new faculty chairs have been added: William Cook (large scale optimization), Jan Karel Lenstra (large scale optimization), Chelsea White (transportation and logistics), William Rouse (School Chair), and Jeff Wu (engineering statistics – starts July 2003).
- Wu's addition will bring the statistics faculty total to 10. Next time the rankings are released for engineering statistics, ISyE expects to be the number one program.



Bill Rouse speaking at the annual State of the School address at the Alumni Assembly

- Other new faculty members include Associate Professor Karen Aardel, Assistant Professor Roshan Joseph, and Assistant Professor Julie Swann.
- Edenfield Executive responsibilities are being shared this academic year by Dr. Kenneth R. Boff, chief scientist at the Air Force Research Laboratory's Human Effectiveness Directorate; and Dr. William C. Kessler, vice president of Advanced Enterprise Initiatives for Lockheed Martin Aeronautics.
- ISyE faculty and students were again honored with numerous awards and fellowships. (See pages 18-21)
- The Georgia Tech Business Network, an organization formed to share talent and resources with alumni, is up and running after a successful kickoff.

Research

- **Dr. Chelsea White**, formerly of the University of Michigan, brought the Sloan Foundation's Trucking Industry Program, worth more than \$1 million a year, to Georgia Tech. The trucking industry is receiving increased attention as part of the nation's deepening commitment to security.
- The Logistics Institute (TLI) offered 34 short courses, in

Atlanta and Singapore, to more than 840 individuals studying global logistics. This number is down somewhat due to the economic circumstances.

- Approximately 30 new contracts and grants were awarded to ISyE faculty, with 30 additional proposals still pending.

Facilities

- ISyE now has two dedicated buildings and part of several other campus facilities. This is significantly better than last year, when the School was spread across seven campus buildings.
- DuPree College of Management will vacate the building next to Groseclose in the summer of 2003, allowing the School to utilize that space.
- The renovation of Groseclose and the DuPree building, previously discussed, has been taken off the table. Instead, focus is on a new building to be built in the next five to six years. It is expected to occupy 200-250,000 square feet at the cost of \$50-65 million—a mix of state and private funds.
- Next year's ISyE Challenge will examine potential placement of the new building. Planning will begin in June of 2003.

GEORGIA TECH BUSINESS NETWORK LAUNCHES

The Georgia Tech Business Network (GTBN) came to life fall semester 2002 with a series of events aimed at providing lifelong support to Georgia Tech alumni, faculty, students, and business partners.

GTBN's official kickoff was in September, when a crowd of more than 150 gathered at the GCATT building. The evening's program featured speakers from those Georgia Tech organizations that offer assistance in economic development and venture assistance, including the Economic Development Institute, VentureLab, and the Advanced Technology Development Center.

There was a similar turnout on a cold and rainy night in January, when the topic was "Investment Forum: Seeing it from the Investor's Point of View." Four IE alumni, who also hold MBA

degrees, served as panelists, each giving an overview of investment from their point of view. The panel, moderated by Dr. Bill Rouse, consisted of: **John A. Harrison, BIE 1966**, the retired chief financial officer of Financial Securities Assurance; **Bob Marbut, BIE 1957**, chairman and consultant to Hearst Argyle and The Hearst Corporation; **John C. McLean Jr., BIE 1970**, retired senior executive vice president of Wachovia Corporation; and **John Ratliff, BIE 1981**, corporate vice president and chief financial officer of Acterna Corporation. The panel then took questions from the audience.

So far the majority of those in attendance have been IEs, but the goal is to encourage GTBN membership of alumni from all Georgia Tech colleges and schools. There is plenty of time for networking at the beginning and end of the formal program.

David Touwsma, BIE 1997, serves as president of the new organization. "It was Dr. Rouse's idea to bring everyone

together to learn and propel people's careers by sharing knowledge," says Touwsma. "He believes this is a way we can increase the value Georgia Tech brings to our degrees. So far, the feedback has been tremendous—everyone is asking, 'what else have you got?'"

What the GTBN does have is a website, www.gtbn.org, that is set up to encourage interaction between GTBN members. In addition to the calendar of events and copies of presentations from past events, there is an area for group discussions, downloads, and feedback. There is also a listserve, and a section for cyber book clubs (for more information, contact ryan.ogden@netnet-group.com). The site is designed to make it easy to communicate with any or all members of the Network.

The evening sessions with programs are scheduled for four times a year, and GTBN also plans to hold four "lunch and learn" events and four breakfasts. The breakfasts will

(continued on page 13)



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C O N N E C T I O N



C O M M U N I T Y





Security, Efficiency, and the

XTENDED ENTERPRISE

by Dr. Chip White, *ISyE Chaired Professor in Transportation and Logistics*

“Mom and Pop” business may be mostly a thing of the past, but you may be surprised to know that the products (e.g., cars) and services (e.g., package express) we enjoy today are the likely result of an extended enterprise, a network of independent companies, often located in different countries and time zones, seeking mutual business advantage in order to:

- Design, manufacture and deliver “right-quality” and “right price” products and/or services to customers faster than the competition.
- Win customers in the presence of competition.

Such enterprises consist of suppliers, manufacturers, wholesalers, retailers, distribution and logistics companies, communications and information systems companies, and, of course, customers. Each company within an enterprise specializes in what it does best; the members of the enterprise cover the competencies that are critical to the goal of the enterprise. No single company can have world-class competencies in all areas. However, a well-designed enterprise can, thus providing formidable competitive advantage.

Due to the amount of sharing required for effective extended enterprise, the role of data becomes key. The right data at the right time, in the right form, i.e., information, adds significant value to effective decision-making for improved economic competitiveness. Access to such data is increasingly available by Internet and web-based technologies.

Research has shown that effective extended enterprises are those that are well managed and well designed, where:

- Management involves using analysis and experience to run the enterprise, as currently designed.
- Design involves making a series of strategic make-or-buy decisions—choosing what work to outsource to suppliers, choosing which suppliers to use, and negotiating the contract—in order to ensure critical competencies are best represented in the enterprise.

Drivers of Change – Homeland Security

A number of ISyE faculty and students are currently involved in research concerning extended enterprise. A central focus of this research is understanding how forces outside the enterprise, i.e. drivers of change, affect how the enterprise is managed and designed. Such drivers of change include:

- Availability of investment/venture capital
- Pressures to reduce cost (and the challenge of accurately measuring cost)
- Pressures to improve/expand/contract the set of services and products offered
- Advances in key technologies
- Changes in international trade policies and governmental regulations
- Labor relations and other human resource issues
- New business practices and work systems (e.g., lean thinking, quality engineering, concurrent design, Six Sigma, shared risk, build-to-order).

Security concerns are now rapidly emerging as a key driver of change. For example, in automotive manufacturing, lean manufacturing and logistics required significant adjustment (headlines read “Will Just-in-Time becomes Just-in-Case?”) as the difficulty of moving auto parts increased due to more lengthy security inspections across the Ambassador Bridge between Canada and Detroit immediately after September 11, 2001. The design of automotive supply chains now takes into account the potential difficulty of moving auto parts across international borders during major disruptions. The end result is a growing tendency to locate suppliers in the same country as the assembly plant.

A Key Freight Logistics Challenge

And of course, the freight transportation system can be the delivery system for terrorism, as was the case for the air passenger system on September 11. A key challenge is how to ensure that the national freight transportation system is secure and economically competitive. To address this challenge, a group of ISyE faculty (Alan Erera and Chip White) and their students are examining several critical issues in freight transportation security and efficiency. One of these involves containers at transshipment seaports. U.S. Customs is now working with the world’s 20 largest non-U.S. seaports to essentially “push back” the U.S. border and perform security inspections for containers that are U.S.-bound and require inspection at these ports. In light of this new U.S. Customs policy, and the concern that security inspections can reduce seaport efficiency, the ISyE team is addressing such questions as:

- How should containers, some of which require security inspections, be moved from in-bound ships to out-bound ships so as to minimize (a) out-bound ship departure delay and (b) the additional handling costs incurred due to security inspections? An answer to this question has clear operational value.
- What is the upper bound on the percentage of containers undergoing security inspections so that departure delay does not significantly alter a port’s competitiveness position? The answer to this question is of value to the port manager and to U.S. Customs from a port management perspective. There is no benefit to either party for a cooperative port to become less competitive and lose market share.
- What is the relative value of knowing which containers are to be inspected (a) before in-bound ships dock, (b) while the in-bound ships are being unloaded, and (c) later in the process of unloading the in-bound ships and loading the out-bound ships? The answers to these questions might have implications from a policy perspective, specifically regarding when information should be required from in-bound ships.

Each company within an enterprise specializes in what it does best;

the members of the enterprise cover the competencies

that are critical to the goal of the enterprise.

The ISyE team is currently working on these questions with researchers at the National University of Singapore through the support of The Logistics Institute (TLI) in ISyE and the Asia-Pacific branch of TLI, TLI-AP. It is also linking up with the Rotterdam port and, closer to home, the port of Savannah, the fifth largest container port in the U.S. and growing. Additionally, the team is involved with an industry consortium investigating answers to the above questions at many of the major container seaports worldwide.

The methodological approach the team is taking uses a mixed integer program (MIP) to model how containers should be moved from the in-bound ships to the out-bound ships, assuming that the containers to be inspected are known before the in-bound ships dock. The team then uses this MIP sequentially for the case where such information becomes available while the containers are being unloaded or even later in the transshipment process. A comparison of the solutions of these problems will provide a quantitative measure of the value of when this information becomes known and will represent a step toward achieving our national goal of a secure and efficient freight transportation system. 

For more information, contact Dr. Chip White at
cwhite@isye.gatech.edu

Eliminating E-waste:

Recycling through Reverse Production

by Dr. Jane Ammons, NSF Advance Professor of Engineering, Professor of Industrial and Systems Engineering and Sarah Banick

During the past decade, computers and new technology have revolutionized information processing. But there is a downside to what is traditionally seen as a clean industry. As our computers grow faster and more capable, we set the old ones aside for the newest model. The resulting electronic waste, or “e-waste” does not disappear so easily. In fact, it is the most rapidly growing waste problem in the world. The overwhelming quantity of e-waste is one issue, but the other critical concern is the number of toxic ingredients that are being released into our environment. Lead, beryllium, mercury, cadmium, and brominated-flame retardants pose both occupational and environmental health threats.

If you or your business are careful to recycle old computers, you may think you are not contributing to the problem. But according to the Basel Action Network, a global network of environmental activist organizations, recycling companies in Western countries simply pass the toxics on to somewhere else. Industry sources estimate that between 50 to 80 percent of the wastes collected for recycling are not recycled domestically at all. They are sent to countries like China, where poor environmental standards and low wages encourage workers to risk their health to recover the minor amounts of gold, silver, copper, and aluminum. Despite this, the U.S. Environmental Protection Agency estimates that 12 million tons of e-waste may soon be jamming American landfills.

Among those searching for a responsible solution is Dr. Jane Ammons, ISyE NSF ADVANCE Professor of Engineering. Dr. Ammons was recently appointed to the state of Georgia’s newly created Computer Equipment and Disposal Recycling Council. This board advises the Governor and legislature on potential actions and policies to enhance electronics recycling and reuse. She is also working in cooperation with the Pollution Prevention Assistance Division of the Georgia Department of Natural Resources (DNR) and the National Science Foundation on a study they hope will offer a model for other states and nations. Chemical Engineering professor Matthew Realff is also involved.

The professors are using a “reverse production” system that designs infrastructure to recover and reuse every material contained within e-wastes—metals such as lead, copper, aluminum, and gold, and various plastics, glass, and wire. Such a “closed loop” manufacturing and recovery system offers a win-win situation for everyone, meaning less of the Earth will be mined for raw materials, and groundwater will be protected. Ammons says that this simple concept requires a new way of thinking of waste as a resource. Figure 1 illustrates the key flows in forward and reverse production systems.

Last summer, Ammons, Realff, and their graduate students presented a paper on Robust Infrastructure Design for Reverse

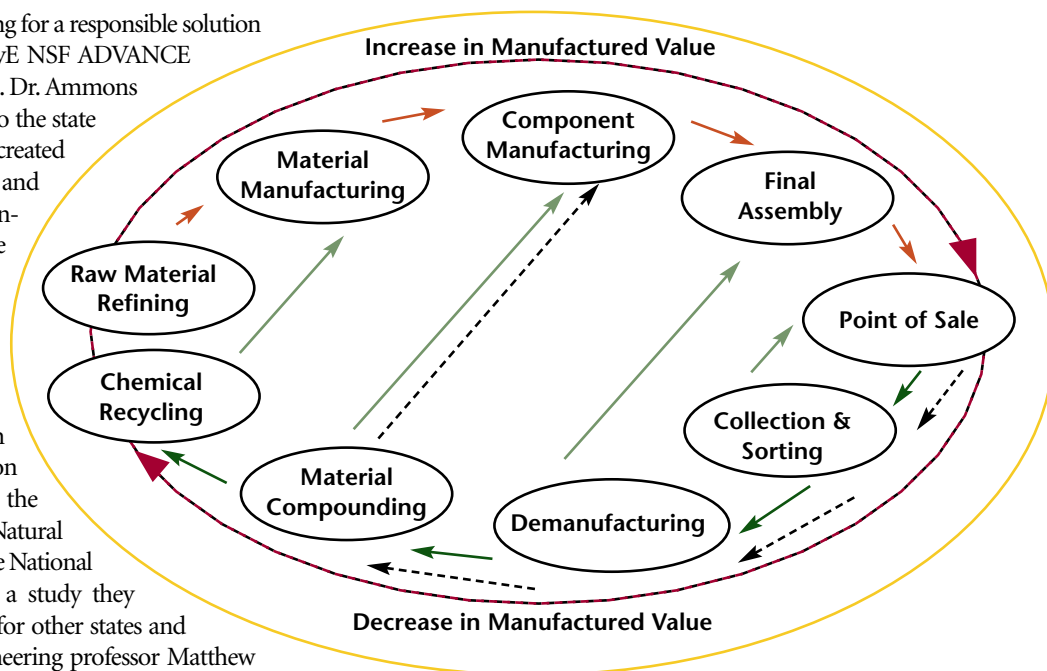


Figure 1. Material Flows in Forward and Reverse Production Systems (Ammons, 2000)

Electronics waste, or e-waste, is rapidly accumulating in many countries. Improper disposal is creating serious long-term environmental problems, especially in developing nations. Major hazardous components in the electronics waste stream are Cathode Ray Tubes (CRTs), due to high lead content.



Production Systems at the International Conference on Supply Chain Management in Beijing, China. The authors discuss the growing attention to efficiently designing and operating systems so they may handle the return flows of production wastes, packaging, and end-of-life products. The paper focuses on the strategic design of reverse supply chains that face significant uncertainty and are interwoven with the forward production chain. The driving forces for development of these complex supply networks may be financial and economic, but they are also a response to an urgent social issue.

The paper presents an approach for planning the strategic infrastructure of reverse manufacturing systems when uncertainty of key parameters is a critical issue. A mixed integer programming model is used to develop a robust solution using the criteria of minimizing the maximum regret. The approach is demonstrated using an electronics recycling case for the state of Georgia.

Case Study Overview

Electronic equipment, especially computers and televisions, is a ubiquitous part of life, with per capita ownership expected to rise for the foreseeable future. Equipment obsolescence due to technological advances such as increasing computer speed

and memory, high definition television, and flat panel computer monitors will likely increase discards of these items. While much older equipment will be reused or stored for some additional years after its useful lifetime, all electronic equipment will sooner or later be discarded.

This case study is concerned with the reuse and recycling process of electronic equipment (television, computer monitors, and CPU) collected from the residential and business sectors of Georgia, with particular emphasis on avoiding the disposal of hazardous materials in landfills. The goal is to develop a fundamental understanding of how to build this infrastructure in a way that it is effective and economically viable.

The effective infrastructure of collection sites, processing sites, and transportation networks are required in order to accomplish this goal with maximum profit from a minimum budget. Data have been collected from many different sources to develop a reasonable representation for Georgia. For example, one of the non-profit organizations that helped provide model data is ReBoot, shown in Figure 2. ReBoot is a statewide, collaborative effort of many groups and organizations committed to recycling computers for people with disabilities. ReBoot acquires the equipment, evaluates it, repairs it if needed, loads licensed software, distributes the equipment to people with dis-

abilities, and trains the person on the equipment. Currently, the organization has placed more than 4,900 recycled computer systems with disabled people throughout Georgia, the Southeast, and the United States. During Spring Semester 2003, an ISyE senior design project team was tasked to redesign the warehouse at ReBoot and to develop an inventory management system to better suit the organization's needs. The ReBoot team consists of five members working under the direction Dr. Paul Griffin, Associate Chair for Undergraduate Studies and Associate Professor in ISyE. This semester, Dr. Griffin's senior design class consists of more than 60 students and 12 individual project teams. Since 1999, ISyE students have completed 12 senior design projects at ReBoot. (If you or your company have a used computer or cell phone to donate to ReBoot, more information can be found at their website: www.gatfl.org/reboot/.)



Figure 2. Georgia Tech graduate students on a visit to ReBoot in Tucker, Georgia. ReBoot project manager Carolyn Phillips is shown fourth from left with staff and contractors. ISyE graduate students include Devon Oudit (fifth from left), Manu Sharma (third from right), Tiravat Assavapokee (second from right), and I-Hsuan "Ethan" Hong (far right).

For the case study, the State of Georgia is separated into 12 different regions based on service delivery regions of Department of Community Affairs (DCA), shown in Figure 3. Representative collection and processing sites are also shown in the figure.

Each region represents a source of electronic waste streams, a collection site, and a demand point for the materials after refurbishing process. The approximated amount of electronic equipment available for each source is estimated from the population in each region combined. Due to lack of space here, the parameters and information used in the model (Supply, Collecting sites, Processing sites, Demand, and Transportation information) are given in Ammons, et al. (2002).

The main drivers for the system design, which are also uncertain, include the supply percentage, the options of CRT recycling, and the percentage of usability of the material collected, as well as the volume of material that will be brought in for recycling and the quality of that material. Consumer surveys indicate that about six percent of households have an item of equipment ready for disposal (Pasco County Staff, 2000).

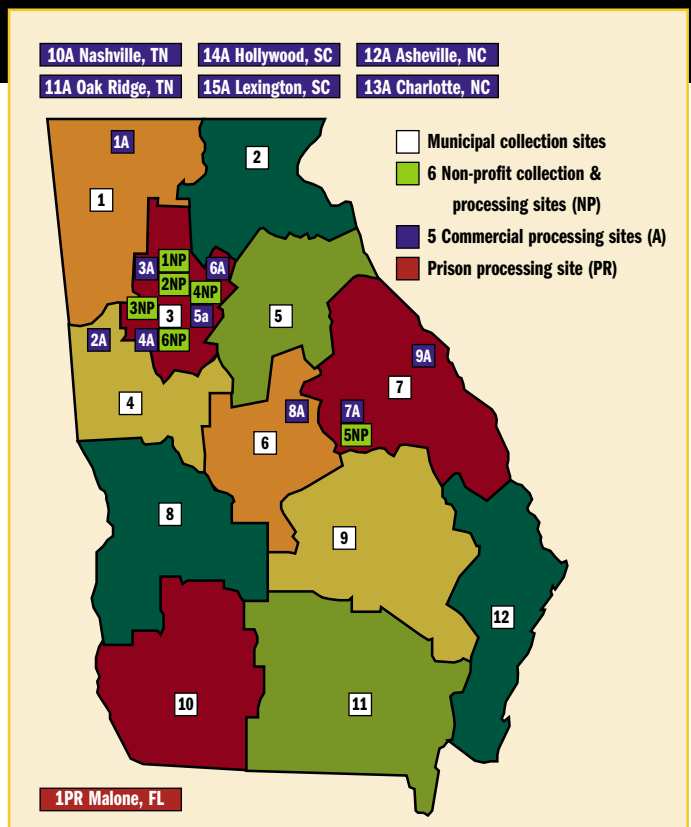


Figure 3: State of Georgia with Representative Processing Sites

The uncertainty is how many of these households will participate in whatever collection system is put in place. We term this the percent participation, and use two potential values: 10 and 30 percent. In addition, a key uncertainty is whether the system can allow material to be shipped (at relatively high cost) to a CRT glass recycler in Ohio. In the case of electronics recycling, the quality indicator is how much of the stream can be re-used in other applications, as opposed to being junked for material value only. We term this by the percent usable, and use two levels for each product type. It is important to realize that the determination of whether or not the item is usable is made during the sorting process and hence all of the items must be collected regardless of their eventual usability. These uncertain factors were used to define 16 problem scenarios that are shown in Figure 4.

Case Study Solutions

The case study was solved on a Window NT-based MHz Pentium II personal computer. For solving mixed integer programming for this case study, Visual Express v12 [Dash, 1999] was used as the optimization program. MS-Access and Visual basic programming languages were used as this case study database and data-transferring program.

The objective function results for all scenarios under each of three model types are shown in Figure 5. It is clear from the figure that the relative collection percentage and usable percentage have a substantial impact on the net profit of the solution infrastructure, confirming intuition that the worst economic outcomes would be realized in scenarios 13 - 16. The robust solution is constructed using the methodology outlined in the

Useable % TV: 30% CPU: 40% Monitor: 40%			
		With all CRT Recyclers	With only CRT recycler in OH
	10%	Scenario 1	Scenario 2
	30%	Scenario 3	Scenario 4

Useable % TV: 10% CPU: 40% Monitor: 40%			
		With all CRT Recyclers	With only CRT recycler in OH
	10%	Scenario 5	Scenario 6
	30%	Scenario 7	Scenario 8

Useable % TV: 30% CPU: 20% Monitor: 20%			
		With all CRT Recyclers	With only CRT recycler in OH
	10%	Scenario 9	Scenario 10
	30%	Scenario 11	Scenario 12

Useable % TV: 10% CPU: 20% Monitor: 20%			
		With all CRT Recyclers	With only CRT recycler in OH
	10%	Scenario 13	Scenario 14
	30%	Scenario 15	Scenario 16

Figure 4. Sixteen Problem Scenarios for the Case Study

paper. The performance of this solution demonstrates that it is able, with one set of infrastructure, to perform reasonably close to the optimal solution across the wide range of uncertainty. This result is encouraging, indicating that relatively better decisions can be made if attention is paid to the uncertainty.

These results also point out the need to better understand how to design systems to encourage larger collection percentages and higher usability percentages. For example, collection systems that facilitate user convenience should be a goal. Also, getting equipment back while it is relatively new, before it has the chance to sit in the closet or basement and get obsolete, may require targeted marketing and education campaigns. The model can help quantify the potential benefits of these efforts.

What's Next?

Professors Ammons and Realf and their team of graduate students are working to extend and refine their models, methodology, solution approach, and databases to better understand how to design reverse production systems for electronics recycling and reuse. Insights are being shared with researchers around the world and with key officials who are in the process of designing local and regional policies to address this challenging problem. Through this work, Georgia Tech hopes to have an important impact on the environmental welfare of future generations and on the ultimate creation of "closed loop" manufacturing systems for our society. 

For more information, contact Dr. Jane Ammons at jammons@isye.gatech.edu

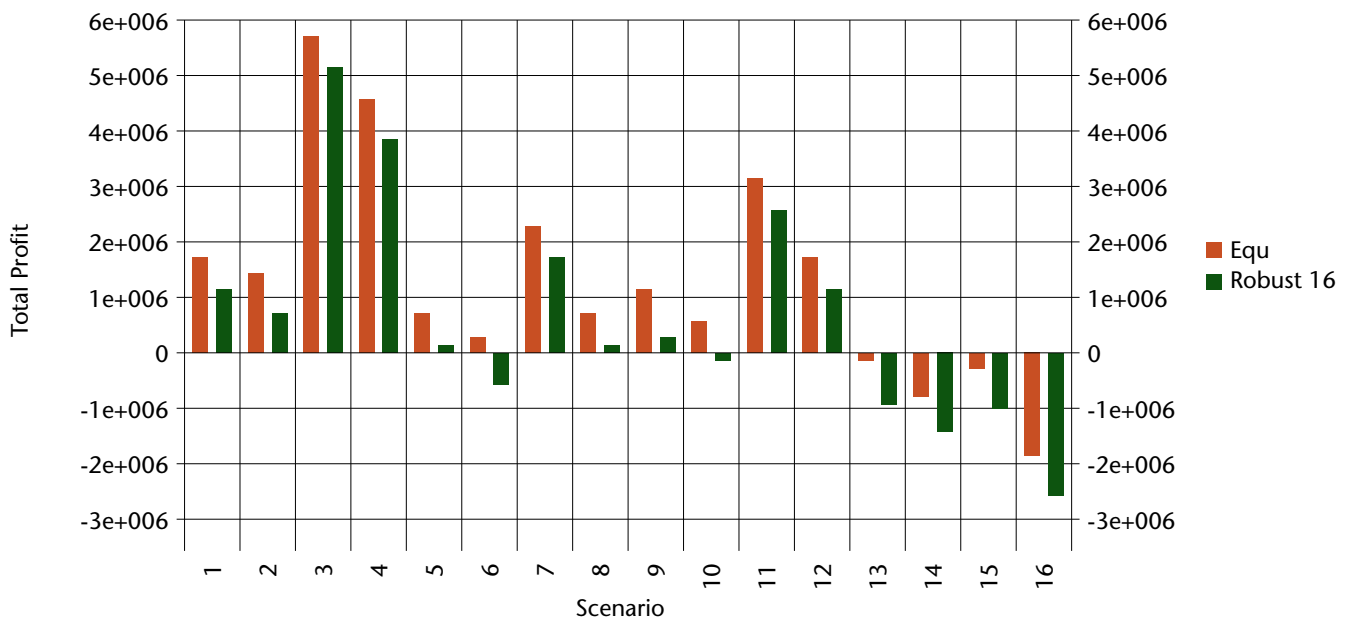


Figure 5. Objective Function Value (Net Profit to nearest thousand) Obtained for Each of the Scenarios and for the Robust Solution

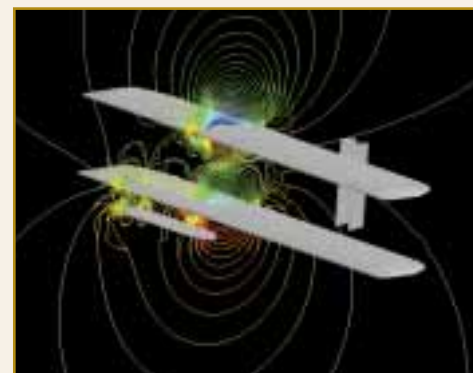
Wright Again: IE Alumna Uncovers Details of the

HISTORY OF FLIGHT

Dr. Jani Macari Pallis, BIE 1975 and MSHS 1977, is the author of the following letter, recently sent to friends at Georgia Tech. Dr. Pallis is the founder, chief executive officer, and president of Cislunar Aerospace, Inc., a San Francisco engineering, education, and research firm. Here, Dr. Pallis relates how she became involved with the Wright Again project and how it feels to help unfold history.

Some of you know that I have had the privilege of working with The Franklin Institute Science Museum in Philadelphia on a once-in-a-lifetime project regarding the Wright brothers. Our project is called Wright Again (www.wrightagain.com), since it follows the development of the first powered flying machine, the 1903 Wright Flyer. From the time the Wrights were young boys in 1878, making model helicopters, until December 17, 1903, the date of the first powered flight, Wright Again examines the Wright's steps and actions, provides a scientific explanation of what went right (or wrong) that day, and provides hands-on activity for students in grades 5-12. This collaboration began a few years ago when The Franklin Institute contacted Cislunar to use some of our educational materials on aerodynamics for kids created with NASA support (wings.avkids.com). We agreed and as a thank you, the museum director said to me, "You know if you are ever in Philadelphia, most of the Wright brothers' things are in the room next to me—come over and we'll put the white gloves on you and you can take a look."

A computer simulation shows the plot of pressures near the main components of the 1903 Wright Flyer. (Photo Courtesy Cislunar Aerospace, Inc.)





The original lift/draft balance on the flyer used by Orville and Wilbur Wright. (Courtesy The Franklin Institute Online, www.fi.edu. Copyright The Franklin Institute. All rights reserved.)

Having done a bit of work on the Wright brothers for our first project, including the staff's aerodynamic simulation of the Wright Flyer (wings.avkids.com/Tours/wright.html), I thought I was pretty up on the Wright brothers, so I was puzzled. "What things?" I said.

"Oh," he said, "we have their handwritten notes, wind tunnel journals, their lift and drag balances, all the airfoils [wing shapes] they tested—we even have the wallpaper." "The wallpaper? What wallpaper?" I asked. "Oh, they wrote some of their results on the back of wallpaper scraps," I was told.

This I had to see. I thought all those things were either lost over the years or at the Smithsonian. By the time I took a trip to the museum there was a new director, Karen Elinich, who just as gracious and is now the co-investigator of our project. There was drawer after drawer and box after box of drawings and artifacts from their workshop. As I looked, I would comment, "Oh, geez—you know what this is? This is a prop design....or this is a calculation for drag." The senior museum curator finally said, "We've had these here for 50 years, but we've never had an engineer look at them. We're all historians here." A few more conversations and our project, Wright Again, was born.

I am hoping you or perhaps colleagues, friends, pre-college students or educators you know might be interested in visiting our site or signing up for our monthly newsletter (see address below). All of our educational content is free, on the Web, and kid safe. There are a few different projects on the Wrights going on now, but I think Wright Again is more technically comprehensive and unique educationally than any of the others. Our project teaches basic forces of flight, structures, propulsion, and aerodynamics to kids.

Some of you have asked me to point out a few things that might be of interest:

For one thing, the first powered flight was not at Kitty Hawk. It was in a town four miles south named Kill Devil Hills.

The Kitty Hawk area was selected for the high constant winds and because of all the sand—for soft landings!

So why are all those artifacts at The Franklin Institute and not at the Smithsonian? As the story goes, Samuel Langley (yes, as in NASA Langley and Langley, Virginia) was the secretary of the Smithsonian. The government funded Langley's research to create a flying machine. Just before the Wright's successful flight, Langley attempted the first flight—the plane ditched into the Potomac River a few seconds after it was launched. The Smithsonian later inferred Langley had built the first powered flying machine. Clearly this miffed the brothers. Although Wilbur died in 1912, Orville lived until 1948, and he was not interested in providing the Smithsonian any of the Wrights' work for many years. Subsequently, the 1903 Wright Flyer was housed at the Science Museum of London for years.

The Franklin had acknowledged the Wrights as first in flight almost immediately. Orville willed all of their workshop artifacts (now known as the Wright Aeronautical Collection) to the Franklin. His estate executors gave the brothers' letters to the

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An airfoil from the original Wright Flyer, part of the Franklin Institute's protected collection of objects.

(Courtesy The Franklin Institute Online, www.fi.edu. Copyright The Franklin Institute. All rights reserved.)

Library of Congress and Wright State University. Orville had discussed bringing the Flyer back to the United States. In 1942, almost 40 years after the Wright's first flight, the Smithsonian wrote a suitable acknowledgement that satisfied Orville and after his death the Flyer was brought to the Smithsonian.

The right wing of the Wright Flyer is four inches longer than the left. The engine weighed about 50 pounds more than either Orville or Wilbur, and the operator would lay to the left of the engine. Bottom line, they needed more lift on the right wing, so it was made longer. Kids will learn that this is similar to a Venetian gondola. The gondolier stands to the left, adding more weight to that side, so the right side of a gondola is wider.

The first thing the curator of the museum gave me to look at was a wind tunnel journal. The journal has printed columns, perfect printing, bound in leather, every number clear and distinct, no scribbles, coffee stains, or telephone numbers in the margins. (You may recall that Orville Wright had a printing business before the bicycle shop.) I now know that this was Orville's handwriting. Wilbur's handwriting is not as neat, and he doodled and drew on things.

The construction of the wings of the Flyer was so flexible that I have better success explaining the wings of their gliders and the Flyer as a sail being rigged. The construction of their gliders and Flyer is so different from modern aircraft construction that sail construction is a better analogy. They actually flew their first gliders as a kite—no human on them.

The Wrights got involved in gliding and flying as a sport. Wilbur wrote more than once that there would never be any fame or fortune for the person that developed a flying machine. You may have heard them called bicycle mechanics—they were businessmen, technicians, engineers, and athletes. Orville was a competitive cyclist. Like many top athletes, Orville was involved in equipment design.

When the first safety bike (equal-sized wheels) came out at the turn of the century, Orville spent \$160 for one. Wilbur waited until they were half price.

Although their father was a bishop in a Christian sect, Orville and Wilbur were agnostics, but they respected their father's Sabbath and did not fly on Sundays. The brothers agreed that they would not fly together, so that one of them could continue the work and for fear that the bishop would lose two sons in one accident.

Their mother was the handy one, she could build and fix anything—their mechanical talents came from her. (She died before any of their experiments started.) Both parents encouraged the boys to experiment.

They built and tested their gliders and the Flyer between 1899 and 1903, but only during the slow season at the bike shop,

a few months per year. Their total cost to develop the first airplane, including travel to North Carolina for four years, was about \$1,200. (How much did Orville spend on that bike?) Langley had a \$50,000 grant from the government and another \$20,000 from the Smithsonian.

On the train ride home after an unsuccessful summer of testing at Kitty Hawk in 1901, Wilbur said to Orville, "Man is not going to fly for another 50 years." The brothers believed that the lift data they were using from other researchers was incorrect. They just didn't get the lift the charts claimed. When they got home, they built a wind tunnel, made small airfoils (wing shapes) out of metal, and in three months they had the most comprehensive set of lift and drag data ever created. Based on what they learned, variations of those wing shapes were made full scale and placed on the 1902 glider and the 1903 Flyer. Those airfoils still exist, and the Institute is allowing us to bring some of those airfoils to NASA Ames and test them to demonstrate the Wrights' work to young students.

There are some mysteries associated with those wing shapes. There is data for some airfoils that no longer exist. We are going to do some "reverse engineering" and see if we can determine what those shapes looked like. Kids can follow us and see if we can or why we can't solve the mystery of the missing airfoils.

One of the things we discovered was that a lot of the Franklin's Wright artifacts have never been on public display and many of the documents have never been published. So these materials are being digitized and will be available online. Students will use original Wright data in their calculations as they follow the project.

I've gone on long enough. There's an awful lot of work we have to get done and a lot to the project in general so I hope that you'll visit our homepage at www.wrightagain.com and pass the URL onto friends.

Interested persons may sign up to receive the Wright Again monthly newsletter at <http://wings.avkids.com/Book/Wright/guestbook.htm> 

Dr. Jani Macari Pallis earned a master's in mechanical engineering from the University of California, Berkeley, and a doctorate in mechanical and aeronautical engineering from the University of California, Davis. Her firm, Cislunar Aerospace, Inc., has a strong interest in science education for children, and it has developed extensive Web content in honor of the December 2003 centennial anniversary of flight. For more information about Cislunar, see www.cislunar.com.

(continued from page 3)

be held at local Atlanta restaurants and feature lively conversation from individuals with diverse business and personal backgrounds. The first breakfast, held at the Silver Skillet Restaurant near campus in February, gave attendees the opportunity to discuss the investment information shared at the January Forum.

For more information on GTBN breakfasts, contact birdblitch@hotmail.com. More information on the lunches will be available later. For the time being these events are limited to Atlanta, but the goal of GTBN is to encourage Tech alumni in other locations to organize similar events.

"We're starting small," said Touwsma, "so we can show these examples of our success and the value they bring to us all. Eventually, we hope to get together for philanthropic events, such as getting a group together for Team Buzz," he adds.

Touwsma noted that the Business Network is different from, and not in competition with, the Georgia Tech Alumni Association. "GTAA is social oriented, while we're putting a business and networking element into play," he says. GTBN also expects to partner with other community groups, such as the Technology Alliance of Georgia (TAG) to promote the value that Georgia Tech brings to the entire community.

To join the Georgia Tech Business Network, go to www.gtbn.org, sign up using your e-mail address, and start exchanging ideas with your fellow alumni.

EDENFIELD EXECUTIVE-IN-RESIDENCE POSITION DOUBLES IMPACT

The Edenfield Executive-in-Residence program is trying something new this academic year, and ISyE faculty and students will receive twice the usual benefit. Instead of recruiting one executive to visit campus for a short time, Dr. Rouse invited two executives who have agreed to visit

once a month for a year, over a three-to four-day period.

Dr. Kenneth R. Boff is chief scientist of the Human Effectiveness Directorate at the Air Force Research Laboratory at Wright-Patterson Air Force Base in Ohio. He will assist ISyE in designing a faculty-recruiting plan that will support growth of the School's research and education programs in human systems. Boff formerly served as chief of the Fitts Human Engineering Division Division of Armstrong Laboratory. He is internationally known for his research on understanding and remediating problems in the transition of ergonomic data and models to applications in the design of complex human-operated systems.

Boff holds a patent for rapid communication display technology and is the author and editor of numerous articles, book chapters, and technical papers. He holds a bachelor's in general psychology and a master's in experimental psychology from Hunter College of the City University of New York, and a master of philosophy and a doctorate in experimental psychology from Columbia University. Boff actively consults and provides technical liaison with government agencies, international working groups, universities, and professional societies. He is founder and technical director of the Department of Defense Human-System Information Analysis Center. He also coordinates the human factors and medicine technology area for the NATO Research and Technology Organization.

Dr. William C. Kessler, vice president of Advanced Enterprise Initiatives at Lockheed Martin Aeronautics Company, will assist faculty in developing a vision and strategy in the broad enterprise systems areas to include interactions across all six colleges at Georgia Tech. In his position as executive organizational architect for LM Aero, Kessler is responsible for the company's overall operational concept, helping LM Aero support future aerospace power projection requirements. Prior to joining Lockheed Martin in 1997, Kessler served as the director of Air Force Manufacturing Technology. He

led numerous pioneering initiatives to address the affordability of military aerospace systems. Kessler has been closely affiliated with the national Lean Aerospace Initiative since its inception in 1992, and currently serves as the Industry Co-Chair.

Kessler received the Outstanding Aerospace Engineer Award from Purdue University and a Laurel Award from *Aviation Week and Space Technology* magazine. He holds a bachelor's and master's in aeronautical and engineering sciences from Purdue University and a doctorate in chemical engineering from Washington University. He spent a year studying and lecturing on experimental fluid mechanics at the von Karman Institute in Brussels. Kessler also attended the Harvard School of Government, the Federal Executive Institute, and the Lockheed Martin Executive Learning Institute, where he studied business management and leadership.

James C. Edenfield, BIE 1957, president of American Software, founded the Executive-in-Residence program to bring experienced and proven executives to campus each year, sharing research and education knowledge from industry. The endowment supports office space, computer equipment, software, secretarial, and student support.

NEWS FROM TLI



TLI Now Offers Certificate in FinListics Web-based e-Series

The Logistics Institute (TLI) now offers FinListics® Solution's e-Series, a series of interactive, web-based courses facilitated by lead content architect Dr. Stephen Timme. The totally web-based e-Series features a just-in-time learning design that allows course participants to take courses whenever and wherever they choose.

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nection, the FinListics e-Series includes three comprehensive courses:

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- *Building a Better Business Case* focuses on both the qualitative and quantitative analysis required to build a world-class business case to support supply chain initiatives.

The e-Series meets criteria for the nationally accepted Continuing Education Unit (CEU). Participants completing the entire e-Series will be awarded the appropriate CEU credits and a certificate in FinListics from The Logistics Institute.

Dr. Stephen Timme, adjunct professor in the Executive Master's in International Logistics program and president of FinListics Solutions and CFOEd™, leads the e-Series. Dr. Timme is a recognized authority on quantifying and communicating the value of corporate investments. He also teaches workshops on The Financial-Logistics Connection at TLI.

For more information about FinListics® Solutions' e-Series, please visit TLI's website at <http://www.tli.gatech.edu> or contact The Logistics Institute at (404) 894-2343.

New Leaders in Logistics

In other news, TLI is pleased to honor the newest Leaders in Logistics member companies:

- General Motors
- Roadway Express, Inc.
- Schneider Logistics



EMIL Class of 2002

EMIL AND THE CLASS OF 2002 MAKE THE GRADE

The Executive Master's in International Logistics (EMIL) program reached a milestone in 2002 when the members of its first class received their diplomas. After traveling the world together, the class of 2000 overwhelmingly gave the EMIL program an A+. The corporations they work for are equally pleased, so EMIL staff and constituents are moving forward with plans to enhance the program's curriculum.

EMIL was the brainchild of ISyE Professor John Vande Vate. Developed by staff and faculty of The Logistics Institute in the College of Industrial and Systems Engineering at Georgia Tech, EMIL's mission is to help Fortune 500 companies face issues in global logistics. In the expanding economies of South America and Asia, as well as in the United States and Europe, the supply chain is often fragmented and challenged by an environment of outsourcing, lean inventories, and e-business. Eleven companies sponsored students in the first EMIL class, and these 24 individuals broadened their perspectives by visiting major corporate facilities on three continents.

Greg Easterlin, CIO and vice president of Supply Chain Management Worldwide for Millikin & Co., found the program stimulating and relevant. "I thought it had a tremendous variety and mixture of business logistics and supply chain management curriculum," he said. "The program was well rounded. It trained us to be business people as well as logisticians, so that we could communicate with the CEO and the CFO in financial terms to sell our projects."

Millikin was quick to implement newly learned techniques. "We made numerous, numerous changes in our organizational structure," said Easterlin. "Using the analytical tools we gained through EMIL, we found that the company had a predominantly intuitive driven supply chain. We've now become more scientific and analytical. We would have never made these changes in the last 18 months had it not been for this program."

Millikin had four employees in the first class and is sponsoring four in the second class. Easterlin said the company will continue to sponsor as many students as Georgia Tech will allow it to enroll.

The program focuses on practical techniques for decreasing logistics costs and improving supply chain efficiencies through coursework in engineering,

information technology, finance, and business strategy. Students are sponsored by their companies and remain fully employed during the program, which consists of five two-week residences in Europe, Latin America, Singapore and Atlanta. Each residence focuses on a unique aspect of logistics: Consumers (Atlanta), European Logistics (Metz, France), Infrastructure (Latin America), Asian Logistics (Singapore), and Manufacturing (Atlanta).

The Class of 2000 was impressive. Fifty percent of the students already had an MBA. Fifteen percent were vice presidents in their companies and 45 percent were directors. They averaged 16 years experience, much higher than the program required of participants, and their job responsibilities included operations, logistics, sales and marketing, material handling, supply chain strategy, distribution, IT, and project management. Most are being groomed for top management within their companies.

While traveling around the world, two weeks at a time, may sound exciting, students found the coursework challenging. Managing Director Terri Herod is grateful that class members were willing to be "guinea pigs," as organizers dealt with their own kind of logistics—hotel rooms, meals, and inter-residence transportation issues. Staff and students agreed that the first residence was the hardest; not surprisingly, since every one and every thing was new.

Feedback from students and faculty is motivating several changes in future classes. The Latin American residence, held in Atlanta, proved difficult to carry off effectively. In the future, that residence will consist of one week in Miami and one in Brazil, so that students can actually be immersed in the culture of Latin America.

There was one disappointment: not all members of the class felt that the Global Business Plan, a team

project serving as a thesis, related to their business. It has been restructured as the Global Supply Chain Project, which allows project teams to remove costs, speed cycle time, or enhance revenue within the global supply chain of their sponsor company. Most projects have a target value of \$1,000,000.

To ensure that EMIL's curriculum remains vibrant and relevant, faculty and staff are planning to work closer with members of the program's Advisory Board, which includes representatives from the 33 of the world's largest corporations. The Advisory Board agreed to work with sponsoring companies to help them convert their employees' new knowledge in results. EMIL's successful start has staff and faculty looking forward to multiple new opportunities.

Meanwhile, Herod and executive director Dr. John Vande Vate, are a just a little frustrated that the grad-

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uating class didn't have much negative feedback. Every single student found the experience rewarding, even those who weren't expecting much. Don Lauer, Chief Information Officer at Hagemeyer, admitted that when he enrolled, he merely wanted a master's degree. "The first residence was really challenging, but it was also a wake up call for me." The new skills he acquired helped him become Global Chief Information Officer for Hagemeyer in The Netherlands.

Ed Rogers, Staff Manager, Corporate Program Management at United Parcel Service, agrees that companies who send more than one student get more out of the program. A district manager when he began EMIL, Rogers had to talk his employer into sponsoring him. Now he has been transferred into the company's Corporate Strategy Group, where his newfound skills are proving valuable to UPS.

FIRST ACHIEVEMENTS: TORO-RAMOS LEAD UNHS ENGINEERING PROGRAM

Georgia Tech industrial engineers are used to breaking boundaries and achieving "firsts." So it is not surprising that one of the first women to receive a Ph.D. in ISyE at Georgia Tech has continued her pioneering ways. **Zulma Toro-Ramos, Ph.D. 1988**, was the first female chancellor at the University of Puerto Rico at Mayaguez (UPRM), and she is now the dean of engineering at the University of New Haven (UNH) in West Haven, Connecticut.

Toro-Ramos was featured in the July 2002 issue of *IIE Solutions*, where she described the challenges she faced moving her career forward. The first challenge was just getting in the faculty door at UPRM, the territory's only land

grant academic institution. Again, she was one of the first females ever hired in the engineering department. It took a lot of hard work, but she moved steadily through the ranks to become industrial engineering department chair and acting dean of the department before being selected as chancellor.

At UNH, where she oversees six engineering programs, Toro-Ramos is working to raise the level of the academic programs by focusing on multidisciplinary engineering education. She told *IIE Solutions* that one of the main reasons students leave engineering programs is because they are not exposed to their core curriculum and other engineering disciplines until the end of their second year. "Nowadays, engineers need to know how to work with other engineering fields—not only other engineering fields, but with other professionals as well... That will require a revision of the whole curriculum, implementation of new labs, and the training of some of our teachers, and we are in the process of doing that already," she said.

Toro-Ramos told the magazine that she considers her experience at Georgia Tech to be the most important in her life. "The quality of the Ph.D. program there, the rigors through which you have to go, prepare you for anything in life, on the one hand. On the second hand, having had the opportunity to work with very well known people in the field helps you a lot." Toro-Ramos' dissertation advisors were Dr. John White, now chancellor of the University of Arkansas (who left Tech during those years but remained on her dissertation committee); and Dr. Leon McGinnis, now Eugene C. Gwaltney Chair.

Toro-Ramos is committed to UNH for at least five years, but her career is far from over. There are many more "firsts" to come before she retires.

ALUMNI NEWS

Births

Sabrina Whitaker McCorvey, BIE 1990, and her husband Michael announce the birth of a son, Michael William II, on June 6, 2002. The family resides in Stone Mountain, Georgia.

Timothy Williams, BIE 1992, MSHS 1993, and his wife, Dayna, announce the birth of Benjamin Joseph on January 27, 2002. He joined sister Caroline and brother Harrison at the family home in Sharpsburg, Georgia.

Deaths

Llania Baseweiz, BIE 1948, of Miami, Florida, died on August 8, 2002.

Samuel H. Orr, BIE 1949, died in March 2002 of Parkinson's disease. Orr, retired, lived in Greensboro, North Carolina, and is survived by his wife of 55 years, three children, and five grandchildren.

Professional News

Matt Adams, BIE 1986, was given the Eagle Award by APPA: The Association of Higher Education Facilities Officers. The award honors outstanding service and lifetime achievement in the industry; it had not been presented in the previous 12 years. Adams is president of Adams Consulting Group, a facilities management consulting group based in Atlanta.

Stephen C. Deas II, BIE 1986, completed his master's of Industrial Statistics degree at the University of South Carolina. Deas is president of his own company, Quality Minds, Inc., which specializes in statistical training for manufacturing engineers and technicians.

Jason Dorris, BIE 1994, has joined his father at Dorris & Associates, Inc., in Peachtree City, Georgia. Jason was working with Bain & Co. in Dallas, Texas, while **Leslyn Dorris, IE 1995**, completed

her M.S. in Information Science from the University of North Texas.

Vicki Yenzer Estrin, BIE 1986, married David Estrin in January 2002. They live in Nashville, where Vicki was recently appointed vice president of Healthcare Management Directions, a healthcare consulting firm focusing on strategies for performance improvement.

Robert W. Fenet, BIE 1969, was recently reappointed to a second three-year term as chair of Hearing Committee #14 of the Louisiana Attorney Disciplinary Board, the ethics arm of the Louisiana Bar Association. Fenet is managing partner of Fenet, Jackson, and Anderson attorneys in Baton Rouge, Louisiana.

David Frye, MSOR 1989, Ph.D. 1999, has returned to Lockheed Martin Aeronautics in Marietta, Georgia, in the Advanced Development Program. He is conducting research and analysis in Aging Aircraft, Mobility Modeling and Simulation, and Engineering Economic Analysis.

Hal Gilreath, MSIE 1995, is living in Annandale, Virginia. He is employed by Winn-Dixie in the Department of Information Systems.

W. Richard Hauenstein, BIE 1957, qualified for the insurance industry's Million Dollar Round Table in 2002 for the 42nd consecutive year. He also received the National Quality Award for the 41st consecutive year. Hauenstein lives in Jasper, Georgia.

Holly Hoenes, BIE 2000, began medical school at Mercer University in Macon, Georgia, during fall semester 2002. Hoenes was a member of the Lady Jackets basketball team while a student at Georgia Tech.

John W. Kilpatrick, BIE 1968, has been honored as one of four NASA employees to receive the Presidential Rank Award in 2002. Kilpatrick is director of NASA Marshall's Engineering Directorate. The award honors federal employees who provide the public with exceptional service over a long period of

time. Kilpatrick and his wife live in Toney, Alabama.

Michelle Hardin McNally, BIE 1997, and **Christopher McNally, BIE 1997**, wed in June, 2002. Michelle is a supply chain management consultant for Cap Gemini Ernst & Young, and Chris is product management for Teradyne, Inc. The couple live in Tyngsboro, Massachusetts.

Amanda Mitskevich, BIE 1987, has been promoted to chief of the Mission Management Office for Expendable Launch Vehicles at NASA's Kennedy Space Center. She and her husband Geoff, PHYS 1986) live in Rockledge, Florida. Geoff works for General Electric.

Victor H. Moses, MSIE 1992, was tapped to lead the Six Sigma initiative for Standard Register's Label Solutions

strategic business unit. Moses was most recently with Compaq Computer Corporation, where he served as Six Sigma black belt/program manager. He and his family now reside in Miamisburg, Ohio.

S. Narayanan, MSIE 1991, Ph.D. 1994, was appointed professor and chair of the Department of Biomedical Industrial and Human Factors Engineering (BIE) at Wright State University in Dayton, Ohio. BIE has 11 faculty members serving more than 100 undergraduates and 80 graduate and doctoral students.

Dr. Fay Cobb Payton, BIE 1989, earned her Ph.D. in Information Technology/Systems from Case Western University in 1997. Her research was recently published in *CACM*, *Healthcare Management Review*, and *Computer Personnel*.

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She is now on faculty at North Carolina State University, where she focuses on data management, warehousing, and mining, as well as IT diversity.

David Perdue, BIE 1972, MSOR 1976, has joined Pillowtex Corporation as chairman and chief executive officer. The company, headquartered in Kannapolis, North Carolina, is one of the nation's leading producers and marketers of household textiles, including towels, sheets, rugs, blankets, pillows, and decorative bedroom and bath accessories. Perdue is a member of the Georgia Tech Advisory Board and the Georgia Tech Academy of Distinguished Alumni.

Beatriz Sosa, BIE 1982, was presented with the 2002 Distinguished Engineer Award by the College of Professional Engineers and Surveyors of Puerto Rico. Sosa, the first woman to win the award, is executive vice president of Valcor-Samcor in Gurabo, Puerto Rico.

Frank C. Wilson, MSIE 1961, is retiring after 39 years as president of International Management, his own management and engineering consulting firm.

STUDENT NEWS

Carolina Borges, BIE 2006, was honored with the 2002 Undergraduate Student Award from the Hispanic Engineer National Achievement Award Corporation (HENAAC). She received a \$5,000 scholarship and a trip to the annual HENAAC conference in South Padre Island, Texas. The award honors Hispanic excellence in science, engineering, and technology nationwide.

Kelli McCoy, MSIE 2004 received a second place finish for the 2002 IIE Student Award for Excellence at the recent IIE Awards Banquet in Orlando. McCoy, who entered Georgia Tech in the fall of 2002, received her BIE from Tennessee Technological University, where she played NCAA Division I

Soccer, was named player-of-the-year for multiple years, received the President's Award for academic/athletic excellence for multiple years, and earned several other awards.

OUR GRADUATES WERE AWARDED THE FOLLOWING FELLOWSHIPS IN 2002:

Achievement Rewards for College Scientists Foundation Fellowships:

- Dawn Strickland
- James Luedtke
- Brian Lewis
- Jerome Coombs-Reyes
- Christina Scherrer

NSF Graduate Fellowship:

- Rebecca Sandino

Outstanding Student Chapter of the Human Factors and Ergonomics Society:

- Ellen Bass

Presidential Fellowships:

- Thomas Cooper
- Brock Walter
- Sarah Wilson
- Lori Norton
- Jennifer Chung
- Paula Edwards
- Matthew Drake
- Dylan Sheppardson
- David Lewis

Shell Oil Fellowship:

- James Delaney

U.S. Department of Defense Graduate Fellowship:

- Jerry O'Neal

Dr. Jerry Banks, ISyE Professor Emeritus, received the IIE Fellow Award at the 2002 IIE Honors and Awards Banquet. Banks, who retired from Georgia Tech in 1999, is now Senior Simulation Technology Advisor for Brooks Automation, AutoSimulations Division, in Atlanta.

Dr. Ozlem Ergun was officially notified in February that she will receive an NSF Career Award.

Dr. Renato Montiero received the 2002 INFORMS Computing Society Prize.

Dr. Amy Pritchett was recommended in February to the Board of Regents for promotion to Associate Professor with tenure.

Dr. Harrison M. Wadsworth, BIE 1949, MSIE 1954, has received the Freund-Marquardt Medal from the American Society for Quality for his many years of leadership and scholarship in the standardization of quality practices. Dr. Wadsworth chaired or convened numerous ISO and ASQ standards development committees during the past 30 years. He earned his BIE and MSIE at Georgia Tech, as well as a doctorate at Case Western University.

Dr. William Rouse, H. Milton and Carolyn J. Stewart School Chair and Professor, was honored with the IEEE Wohl Outstanding Career Award. In addition, Dr. Rouse has been named to the College of Engineering Hall of Fame at the University of Rhode Island, his alma mater.

Dr. Shabbir Ahmed and Dr. Shijie Deng received the prestigious Career Award from the National Science Foundation. The ISyE faculty now has 12 members with this distinguished award. 

FACULTY NEWS

Dr. Shabbir Ahmed has received a \$30,000 IBM Faculty Award. This highly competitive award recognizes the quality and the achievement of Dr. Ahmed's work and its impact on industry.

Six ISyE Faculty Earn Prestigious INFORMS Fellow Award

Six ISyE faculty members were honored with an inaugural "INFORMS Fellow Award" at the Institute's Annual Meeting in San Jose, California, in November: John Jarvis, Ellis Johnson, George Nemhauser, H. Donald Ratliff, William B. Rouse, and Michael E. Thomas.

INFORMS (the Institute for Operations Research and the Management Sciences) is a 10,000-member professional society representing members in the fields of operations research, management science, and related disciplines. The Fellows Award recognizes distinguished individuals who have demonstrated exceptional accomplishments and experience in these sciences, and who are long-standing members of the INFORMS society.

"We established this award as a means to recognize illustrious commitment on the part of our members to the INFORMS society and the industry at large in the areas of research, education, service to the profession and to the society, and the management of OR/MS organizations," said Mark S. Daskin, Chair of the Professional Recognition Committee for INFORMS.

ISyE is pleased to honor these distinguished faculty members:

Dr. John Jarvis is the former chair of ISyE and now serves as executive director of The Logistics Institute Asia-Pacific. His professional interests include transportation, distribution, and logistics; networks and linear programming; operations research; and optimization.

Dr. Ellis Johnson is the Coca-Cola Chaired Professor. His research interests in logistics include crew scheduling and real-time repair, fleet assignment and routing, distribution planning, network problems, and combinatorial optimization.

Dr. George Nemhauser is the A. Russell Chandler Chaired Professor. A former co-director of Tech's Logistics Engineering Center, his current interests are in solving large-scale mixed-integer programming problems.

Dr. Donald Ratliff, executive director of The Logistics Institute, is UPS and Regents' Professor of Industrial and Systems Engineering (ISyE). His current research and logistics competencies include intermodal network design, supply chain integration, delivery strategies, cross docking, vendor managed resupply, real-time routing, shipment planning, logistics performance measurement, and container port operations.

Dr. William B. Rouse is the H. Milton and Carolyn J. Stewart Chair of the School of Industrial and Systems Engineering. His research focuses on individual and organizational decision making and problem solving, decision support systems, and information systems. Dr. Rouse has consulted with numerous enterprises in the private, public and non-profit sectors.

Dr. Michael E. Thomas, former professor, chair of ISyE, and Institute provost, is the executive director of the Center for Internet Research, Policy, and Application. He is responsible for increasing collaboration, expanding research opportunities, and forging new research alliances in information security, information technology policy e-business, and new hardware and software systems.

Award-Winning IEs

Alumni Assembly Rewards Success

ISyE recognizes successful graduates at the annual Alumni Assembly, held in conjunction with Homecoming each autumn. In 2002, the ISyE Academy of Distinguished Alumni welcomed Dr. Jane Chumley Ammons, NSF ADVANCE Professor of Engineering and Professor of Industrial and Systems Engineering; and H. Bruce McEver,

chairman and founder of Berkshire Capital Corporation. David McKenney, chairman and chief executive officer of McKenney's, Inc., entered the ISyE Hall of Fame.



Dr. Jane Ammons accepts her award from Doyle Miller, Chairman of the ISyE Advisory Board.

ISyE Academy of Distinguished Alumni

Jane Ammons earned her Ph.D. in ISyE from Georgia Tech and her MSIE and BSIE cum laude from the University of Alabama. Her academic interests are in production systems design and analysis, manufacturing systems, reverse logistics, and continuous quality improvement. She is an active researcher who has published numerous scholarly articles and book chapters. Among her honors are: Outstanding Young Manufacturing Engineer, given by the Society of Manufacturing Engineers; and Young Engineer of the Year, as named by the Metro Atlanta Engineering Societies. ISyE undergraduates named her outstanding teacher five times, and the top women engineering students awarded her the MERITOR Faculty Excellence Award. She also received the Class of 1940 W. Roane Beard Outstanding Teacher Award.

Dr. Ammons serves as co-advisor of the Georgia Tech Tau Beta Pi student chapter. She has held several leadership positions with NSF and IIE, she has served as a consultant to the Army Science Board, and she is a member of IIE, SME, INFORMS, and the American Society of Engineering Education. In addition to her academic career, Dr. Ammons' worked as a plant engineer for an industrial manufacturer, is a registered Professional Engineer, and provides consulting services for a number of companies.

Bruce McEver earned his BIE from Georgia Tech in 1966 and an MBA from Harvard Business School. He began his career as a venture capital analyst at Bessemer Securities, Inc., later serving as assistant vice president of Corporate Finance at Chemical Bank; vice president for Mergers and Acquisitions with Blyth Eastman Dillon Inc. (acquired by Paine Webber Group in 1981); and assistant to the Chairman of Paine Webber Group. He founded Berkshire Capital Corporation in 1983, pioneering the concept of providing independent merger, acquisition, and strategic advisory services for investment managers and securities firms. He supports a number of the company's long-standing client relationships and advises on various strategic and tactical issues related to Berkshire Capital's transaction assignments.

McEver often speaks at industry-related forums. He is a corporate trustee of Trustees of Reservations and is a member of both the board and the finance committee of the Salisbury Association. He is a member of the board of directors of the Connecticut Chapter of the Nature Conservancy, and a member of the advisory boards at Georgia Tech and Baltimore's Peabody Conservatory. He has a great love of the environment and regularly participates in conservation efforts on behalf of natural woodlands near his Berkshires' home in Connecticut. McEver is also an avid reader and published author.

ISyE Hall of Fame

David McKenney earned his BS in Physics in 1960 and a BIE in 1964 from Georgia Tech, followed by an MBA from Georgia State University in 1968. He served in the U.S. Marine Corps before beginning graduate school, after which he joined The Trane Company as a sales engineer/account executive. In 1972 he joined McKenney's, Inc., a mechanical contracting firm, as vice president. He was appointed president in 1973 and chairman and chief executive officer in 1997. McKenney holds a number of professional qualifications,



Doyle Miller presents the ISyE Hall of Fame Award to David McKenney.

including Licensed HVAC Contractor and Registered Engineer in several states. He is a member of ASHRAE, SMACNA, MCAA, and the American Arbitration Association; and has been an active in all of these. He has twice been named GSPE Greater Atlanta Engineer of the Year in Construction. He is also active in the community: as vice president and board member of Bobby Dodd Industries, an Elder at St. Luke's Presbyterian Church, a member of the ISyE Alumni Board of Advisors, past-president and member of the board of the Georgia Tech Alumni Association, and trustee of the Georgia Tech Foundation. He was inducted in the Georgia Tech Academy of Distinguished Engineering Alumni in 1994. McKenney and his wife, Sarah, have been married 39 years and have three grown children.

Georgia Tech 2003 Woman of Distinction



Mellany Walia, the Friday Night Chair of the Georgia Tech 2003 Women's Leadership Conference, making the award presentation with Diane and Paul as part of the award surprise.

ISyE faculty member **Dr. Jane Ammons** was recognized as the Georgia Tech 2003 Woman of Dis-

tinction in the Outstanding Faculty Member category. The presentation took place at a banquet held during this year's Women's Leadership Conference, February 7-8, in the Georgia Tech Student Center.

The WLC began during the winter of 1998 as means to celebrate, recognize, and learn more about the strong leadership exhibited by women of the Georgia Tech community. The conference is a gathering of women who have sought to become leaders in the classroom and the boardroom as well as the communities where they reside.

An overview of Dr. Ammons' national and international activities and accomplishments portrays a distinguished professional who has successfully integrated research, education, and service. Dr. Ammons has proven to be an exceptional role model to other faculty members, and through her efforts, she has made a tremendous difference at Georgia Tech and in the engineering profession as a whole. Currently, Dr. Ammons is the Georgia Tech College of Engineering NSF ADVANCE Professor of Engineering and a professor in Industrial and Systems Engineering.

This award was a carefully crafted surprise for Dr. Ammons. The concept was initiated by ISyE Development Director Diane Kollar and her nomination developed by Paul Griffin, ISyE Associate Chair for Undergraduate Studies. They successfully kept the secret for several months, and deserve special recognition for their sneakiness.

For two of the past six years, this award has been given to ISyE women. Donna Llewellyn, a former ISyE faculty member and administrator, and now the Director of Georgia Tech's Center for the Enhancement of Teaching and Learning (CETL), was named the first award winner of the Georgia Tech Woman of Distinction in 1998 when she was a member of ISyE. Individuals recognized this week as the Georgia Tech 2003 Women of Distinction include:

Outstanding Faculty Member:

Jane C. Ammons, Ph.D.

Outstanding Staff Member:

Sandi Bramblett

Outstanding Alumna:

Cindy Smith, Ph.D.

Outstanding Graduate Student:

Katie Hudson

Outstanding Graduate Student:

Celesta White

Outstanding Undergraduate

Student:

Amber Yousuf

College of Engineering Inducts IEs

The College of Engineering annual banquet was held in November, 2002. The following ISyE alumni were honored for their contributions to Georgia Tech.

Engineering Hall of Fame

Edward L. Allman, BIE 1948, Chairman and President, Meggitt-USA, Manchester, New Hampshire.

Jose A. Bolivar, BIE 1949, Vice President of Operations (retired), Bacardi Corporation, Guaynabo, Puerto Rico.

**Academy of Distinguished
Engineering Alumni**

Jenifer Cistola, BIE 1981, Vice President, North American Marketing, Subscriber Sector Scientific-Atlanta, Suwanee, Georgia.

John A. Harrison, BIE 1966, Chief Financial Officer (retired), Financial Securities Assurance Limited, New York, New York.

Warren A. Hood, Jr., BIE 1974, Chairman and Chief Executive Officer, Hood Companies, Hattiesburg, Mississippi.

Christopher B. Lofgren, PhD IE 1986, Chief Operating Officer, Schneider National, Inc., Green Bay, Wisconsin.

Michael R. Nash, BIE 1974, Senior Vice President, CT Communications, Inc., Concord, North Carolina.

ISyE Ph.D. Hopeful Awarded Transportation Fellowship

Brian Lewis, a pre-doctoral candidate in the School of Industrial and System Engineering, was named as one of seven national Eisenhower Graduate Transportation Fellows for 2002. This prestigious award, sponsored by the National Highway Institute, is a merit-based award given to encourage the increase of knowledge in the field of transportation in the United States.

The three-year fellowship covers tuition and fees, a monthly stipend, and travel to the annual meeting in Washington—approximately \$100,000. Lewis' research is based on understanding the tradeoffs between security practices and efficiency within intermodel transportation systems. It is a particularly timely topic, as the U.S. government continues to issue mandates on the security protocol for American airports, rail yards, and ports. Lewis' work focuses on seaports, and "the reactive side of those mandates—how do you respond?" he says.

Those who know Brian have high praise for his efforts, especially Dr. Chelsea White, Lewis' co-advisor and director of The Trucking Program. Lewis followed Dr. White from the University of Michigan to Georgia Tech in 2002, after completing his master's in industrial and operations engineering at Michigan in December 2001. Lewis also holds a bachelor's in industrial engineering and operations research from the University of California, Berkeley.

"Lewis is an outstanding doctoral student with a terrific academic record," says Dr. White. Dr. White also describes Lewis as "a high achiever," a trait that is also helping him overcome Lymphocyte Predominant Hodgkin's Disease, a form of cancer diagnosed in May of 2000. "The doctors tell me if I have to have cancer, this is the best one to get," Lewis says, explaining that he found a lump under his arm while he was still at Berkeley. The cancer is non



curable, but the prognosis is good. "I can have a long life with treatment," says Lewis. He participated in a clinical trial through Stanford University, and appears optimistic about new treatments being developed. Still, "the whole mental aspect can be hard," he admits.

Lewis credits his friends and family for their support, especially his fiancé Sandi McCoy, who earned her master's of public health at Michigan and is now employed at the Centers for Disease Control. Her background in health has been instrumental in helping him understand and cope with his illness. He is also grateful for Dr. White and Dr. Alan Erera, whose support has allowed him to continue with his research despite undergoing the periodic treatments.

Dr. Erera, faculty member in ISyE, received the same fellowship from 1997-2000 while he was a Ph.D. student at UC Berkeley. It was he who urged Lewis to apply. "The Eisenhower Graduate Transportation Fellowship program intends to fund truly outstanding students with significant potential to be lifelong leaders in the field of transportation research and education," says Erera. "Brian possesses the analytical research aptitude, the communications skills, and the motivation to become such a leader, and is most deserving of the award," he continued. 

ALUMNI NEWS

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