

# PURDUE & AeroGRAM Astro



A newsletter for alumni & friends of the School of Aeronautics & Astronautics • Spring 1999

## Engineering Master Facilities Plan

The President of Purdue University and the Board of Trustees have approved the Engineering Master Facilities Plan. With the EMFP, the schools of Engineering have taken another step in leading change. This forward-looking plan has the following goal, "To create a flexible technologically advanced physical environment that stimulates intellectual growth, creative activity, and cross-boundary cooperation and scholarly exchange".

Purdue University, under the guidance of Dean Richard J. Schwartz, has therefore launched the Engineering Master Facilities Plan. Long term and comprehensive, the plan will take ten to fifteen years to fully execute and more than \$400 million.


Purdue is determined to make its Engineering schools the best in the world. With that in mind, the plan calls for classrooms and laboratories that will reflect near term vision for

nurturing, learning and research, and to adapt to future visions. Technology in our learning modules and research laboratories will be pervasive, integrated and easily accessed anywhere in the world.

Students will graduate strong in engineering fundamentals, with more hands on experience in laboratory situations and will be capable in such non-technical areas as interpersonal communications, leadership, teamwork, ethics and basic business practices. The composition of our faculty, many whom are theorists, will change dramatically in the next ten years, as one-third retire and are replaced by research-active experimentalists.

The growing graduate program, along with the changing faculty profile, is driving an innovative approach to added graduate instructional facilities and research laboratories that will enable us to

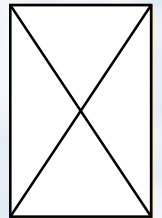
respond to emerging areas of interest and adapt to the changing needs of students and faculty.

While engineering fundamentals will still be taught with integrity, thoroughness and consistency the way in which learning takes place will undergo great change in the coming years. Continuing the tradition of providing a great engineering learning experience wrapped in classrooms and learning technologies that will significantly depart from its past, is a vision that we hope to achieve in the next ten years. The individuals and companies who will help with funds and equipment to turn this plan into reality will be investing in an innovative learning environment that will touch the hearts and minds of our future engineers and leaders. 

## AAE Headlines

- Professor Tom Farris

The 1999-2000 academic year was an exciting one for Purdue and the School. Dr. Martin C.



Jischke was presented as Purdue's 10th President at a press conference held on May 23, 2000. Dr. Jischke received his doctoral degree in aeronautics and astronautics from MIT in 1968. Trained as a fluid dynamicist, Jischke has expertise in heat transfer, fluid mechanics, aerodynamics, and problems related to high-speed aircraft and spacecraft. In recognition of Jischke's expertise, the Purdue Board of Trustees appointed him a professor with tenure in the School. The faculty and students are pleased to welcome President Jischke with confidence that aerospace engineers can accomplish anything. I look forward to presenting more about President Jischke's plans to take Purdue to the next level and how this all relates to the School in future issues of AeroGRAM.

*continued on next page*

**"Determined to make Engineering schools the best in the world..."**

This issue of AeroGRAM covers the academic year 1999-2000.

## AAE Briefing • continued

The School's undergraduate enrollment increased by 22% to 238 in the fall of 1999. At present, the demand for graduates of the School is great in both aeronautics and astronautics industry. The increased enrollment brings with it demand for co-op and internship opportunities. We would be pleased to hear from you about such opportunities at your companies. You can contact myself, Prof. Marc Williams, Associate Head, or Tim Bobillo, the School's Director of Development and Alumni Relations. Tim took on the role played by Nan Ross who is now preparing for the sisterhood with the Sisters of St. Francis of Perpetual Adoration.

Perhaps the greatest joy of being a member of the faculty of the Purdue University School of Aeronautics & Astronautics is watching our graduates grow into successful careers, becoming leaders of the aerospace world. The faculty instituted the Outstanding Aerospace Engineer (OAE) award to acknowledge alumni who have particularly distinguished themselves in their chosen career. The first OEA Banquet was held on October 21, 1999. Over 350 students, alumni, faculty, family and friends attended to celebrate the inaugural granting of OAEs to the 36 in attendance who had distinguished themselves as astronauts, distinguished engineering alumni awards and/or honorary doctorates. We look forward to making this an annual celebration.

Through the guidance of Dean Richard J. Schwartz, the Schools of Engineering are embarking on a \$400 million Engineering Master Facilities Plan (EMFP) that will increase by 60% the space available for education and research. The EMFP calls for the School of Aeronautics & Astronautics to move all of its facilities presently located in Grissom Hall and the Nuclear Engineering Building to the Multi Disciplinary Engineering Building (MEB) located at the corner of Northwestern and Stadium Avenues. In addition, many of the teaching and research activities currently housed in the Aerospace Sciences Laboratories (ASL) will be moved to the MEB. The move to the MEB gives the School of Aeronautics & Astronautics the opportunity to provide its students with team, hands-on educational experiences that integrate its core disciplines of aerodynamics, dynamics and controls, propulsion, and structures and materials. In time, the larger research facilities currently located at ASL will be moved to a new graduate research campus site to be determined. While Purdue will approach the state for construction costs of the MEB, we will need your help to equip the laboratories with state of the art facilities that will make all of us proud. We thank you for all of your support that allows us to provide exciting opportunities and trust that you look forward to learning more about the School's building plans.

*John A. Fanni*


## Purdue Alumni mentor Texas Fly High Program

In April 1999, NASA flew 20 teams of Texas High school students in the "Texas Fly High Program" An outstanding educational opportunity for teams of students to fly with their zero gravity experiments aboard NASA's KC-135A reduced gravity aircraft.

Kevin Metrocavage BS, '96 now working for United Space Alliance, has been the mentor for one of the teams. Prior to the trip to JSC, the teams of students worked with their mentor who then guided them as they learned to operate a zero gravity experiment. Each team mentor flew once with his or her student team. The students, whilst at JSC, attended pre-flight training sessions, facilities tours, and astronauts' presentations.

Professor Steven H. Collicott and his former student Kevin Metrocavage outlined a zero gravity experiment "Operation of a space probe fuel control device" which controls the

shape and position of fuel in a rockets fuel tank. Any bubbles that develop in the fuel must also be controlled to prevent them reaching the engine and interrupting power. These things are critical as the spacecraft moves further away from earth and the control signals that will keep the craft either on course or can save it from disaster.

Professor Collicott and his AAE 490G students designed the test hardware during the first half of spring semester 1999. 



Kevin Metrocavage and students aboard the vomit comet.

## John L. & Patricia R. Rich Scholarship/Fellowship Fund

John Rich (B.S.A.E. '54) established the John L. and Patricia R. Rich Scholarship/Fellowship Fund with a \$250,000 endowment. John retired as General Counsel for McDonnell Douglas Military Aircraft and Missiles Systems. John established the endowment in memory of his wife to provide scholarships and fellowships to top engineering students who have chosen Aeronautical Engineering as their speciality.





## Engineering Giving Clubs

Giving to the School of Aeronautics and Astronautics, or to the Schools of Engineering, will qualify you for the following engineering giving club membership:

Engineer's Club	\$250-499 annually
Dean's Club	\$500-999 annually
Dean's Club Sponsor	\$1,000-2,499 annually
Dean's Club Benefactor	\$2,500-24,999 annually
Dean's Club Lifetime Membership	\$25,000 one time gift

Gifts *anywhere* to the University totaling \$1,000 or more annually qualify you for membership in the President's Council. So please be sure to specify when you want your contribution to go directly to the School of Aeronautics and Astronautics. In all giving clubs, matching gifts by your employer do count towards membership.

## Industrial Affiliates Program

The financial investment of our industry partners is an investment in their future employees. We thank our corporate supporters for their financial gifts which allow us to fund such things as design competitions, new classroom initiatives, the new design/build/test laboratory, outreach programs, and computer hardware and software.

Our 1999-2000 IAP Participants were: AlliedSignal, The Boeing Company, Hughes Space and Communication Systems, Lockheed Martin, Northrop Grumman Corporation, Rolls-Royce Allison, Thiokol Corporation, TRW.

Thank you for your continued support!

## Corporate Giving

AlliedSignal Foundation Inc.*	Hunt IV Trust
AC Engineering Incorporated	J & R Wordprocessing Incorporated
Balboa Marine Yacht Sales	Koerner Warren G. Estate
Boeing Corporation*	Lockheed Martin Corporation *
Caterpillar Incorporated	Northrop Grumman Corporation*
Cummins Engine Foundation	OJIM Inc
Decker Research Associates	Physical Acoustics Corporation
Dogwood Knoll	Pratt & Whitney
Dora I Farms	Raisbeck Engineering
General Motors Corporation	Rolls-Royce Allison*
Griffin Family Trust	Thiokol Foundation *
Hartke Trust	Timken Company
Holaday Living Trust	TRW Space & Defense*
Hostetler Robert and Ellen	United Technologies Research Center
Charitable Gift Fund	Zimmerman Apartments
Hughes Space and Communications*	* Denotes IAP member

## DONOR HONOR ROLL -1999

Our annual Donor Honor Roll lists our alumni and friends who have given generously of their financial resources to support the School of Aeronautics and Astronautics. Many thanks for your investment in us!

The need for individual financial support for our school is great. Your contributions do make a difference to us and help us in achieving our mission of teaching, research and service. Listed below are those alumni and friends who have donated to the school. Many Thanks!

### \$25,000 OR MORE

Kiahsuang Lo  
Gary & Sue Payton  
James & Sherry Raisbeck  
John Rich  
Geneive Spraker

### \$2500 - \$24,999

Richard & Lana Couch  
Marguerite Hobbie  
Gail Jewell  
Vlado & Mary Lenoch  
Carmel Mould  
Dale Smith  
David & Linda Swain  
Richard Taylor  
Robert & Totsye Winslow

### \$1000 - \$2499

Roger de Quay  
Robert & Thelma Andresen  
William Baker  
Edmund & Virginia Ball  
Charles & Donna Bright  
Thomas & Judith Downs  
Eric & Guyneth Dunville  
Thomas & Bernadette Farris  
Joseph & Patricia Gernand  
Alten & Barbara Grandt  
Winthrop & Sarah Gustafson  
George & Charline Hawk  
John & Linda Hayhurst  
John Hinchman  
Douglas Joyce  
H. Irving & Annette Kerr  
David & Mary Lane  
Alan Leewood  
Garner & Carrie Miller  
Thomas & Donna Pivrotto  
Robert Reed  
Albert & Joyce Roberts  
Tamaira Ross  
Jon & Barbara Ruhlman  
Donald Salo  
M. Andrew & Cherie Simo  
John & Jean Sullivan  
Chin-Teh & Iris Sun  
Richard Swenson  
Timothy & Cynthia Trowbridge  
John Wasson  
Wayne & Christine Willich  
Henry & Dilling Yang

### \$500 - \$999

Richard & Grace Adams  
Terry Baughn  
Lee Bertram  
Charles Black  
Mark & Lynne Brown  
Carl & Joyce Cawood  
Mary Cedars  
Albert & Phyllis Cleaver  
Phillip & Delores Cler  
Steven Collicott  
Marco Crovesi  
John Donelson  
Edward & Hilah Dorsey  
John & Beverly Emerson  
John & Grace Foster  
Samuel Gilkey

Herman Hall  
Kenneth Hines  
Irene Hofer  
Robert Hostetler  
Hsichun & Margaret Hua  
Kenneth & Betty Johnson  
Robert Johnston  
Lyle & Diane Jones  
Yung-Fu Kao  
Raymond & Elsie Kelly  
Jerry Lockenour & Rosalie Russo  
John Matson  
Beverlie Maynard  
Stephen & Elaine Melonides  
Walter Newgeon  
William & Diane O'Neil  
Thomas Parkinson  
Richard & Joandra Petersen  
Charles Pratt  
J. David & Karen Schweikle  
William & Linda Scroggin  
Richard Spencer  
Robert & Mary Strickler  
John Unger  
James & Nancy Valrance  
Matthew White  
Thomas Wible  
John & Frances Wiley  
Jeffrey Williams  
Richard Winkler

### \$250 - \$499

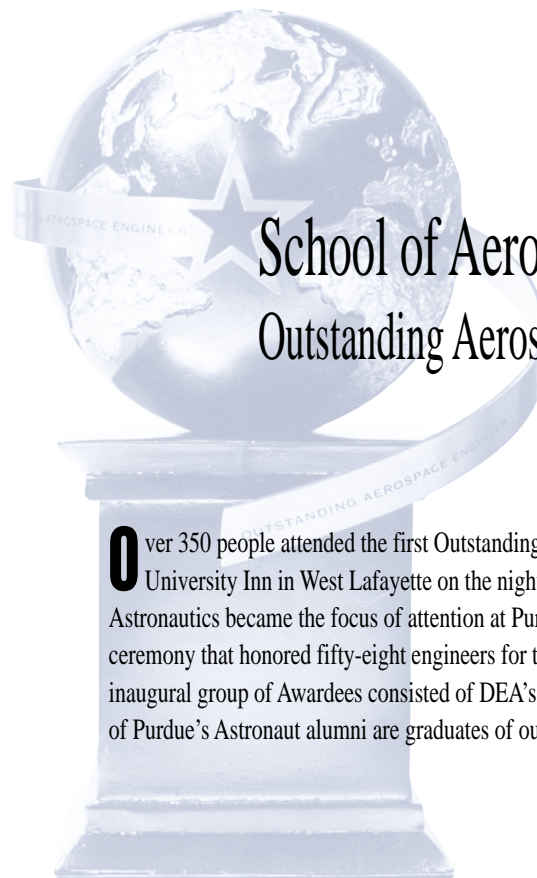
Herbert deBruyn  
Mark & Lorri Amaya  
David & Eugena Amerman  
Richard Annable  
Norman Baffer  
Eric Bates  
George Baturevich  
Douglas Becker  
Joel & Jeanine Benson  
Steven Braciak  
Glenn & Ann Brunner  
Russell Burley  
Frank & Grace Cafarella  
Richard & Sharon Carroll  
Donald Chamberlain  
Edwin Chim  
Richard Clark  
William & Phyllis Covington  
Emile & Christine Davidzuk  
Maurice Dora  
Steven & Catherine Ehlers  
Dennis Epple  
John & Nancy Ervin  
Larry Evans  
Richard & Molly Farris  
Charles & Marilyn Force  
Sanjay Garg  
John Gavin  
James Gaynor  
Robert Gibbs  
William Goldberg  
Jeffrey Grove  
Charles Hartke  
Ernest Hartman  
William & Ruby Heard  
Todd Heidenthal  
Julie Hudson

continued on next page

Wayne Hunnicutt  
 Michael Hyer  
 Wesley Imada  
 Martin Ingwersen  
 John Kelley  
 Robert Leckinger  
 Harvey & Barbara Lee  
 Benjamin & Jennifer Linder  
 Oscar & Louise Lui  
 Martin Marler  
 Richard Mathias  
 Dean & Susan Matz  
 Charles May  
 Desco McKay  
 Douglas McKissack  
 Timothy & Linda McLaughlin  
 Michael Mesarch  
 James Meyer  
 Stephen Morrison  
 Roger & Cecelia Nichols  
 Tobin Ortstadt  
 Modris Ozols  
 Bruce & Barbara Reese  
 Charles & J. Rosemary Reid  
 Robert Rencenberger  
 Yuting Rui  
 Henry Rumble  
 Fredrick Shaffer  
 Leroy Sprunger  
 Paul & Barbara Stainback  
 Andrew Steinbeck  
 Kenneth Strack  
 John Thomas  
 Lloyd Townley  
 Rene & Elizabeth Wernicke  
 Charles Yarber

#### \$100 - \$249

William Ailor  
 Allen Alman  
 Richard Andersen  
 Christopher & Jennifer Azzano  
 Lolitia Bache  
 Barton & Elizabeth Bacon  
 Cecil & Myrtis Bailey  
 Gary Barrett  
 Denison Bassett  
 John & Kathy Baughman  
 Paul Begeman  
 Bradley & Jane Belcher  
 Christopher Benich  
 Dale & Maureen Berry  
 Paul Bevilacqua  
 Frederick Blomshield & Cynthia Privoznik  
 Charles & Joyce Bock  
 Kevin Bogan  
 David Bokash  
 Jon Bonk  
 Raymond & Lorie Bovaird  
 David & Jeanne Bowditch  
 Angela Bowes  
 Robert Brandt  
 William & Karen Brant  
 Kent & Jacqueline Brasseale  
 Donald & Deserie Bremer  
 Roy & Benita Bridges  
 Dean Bristow  
 Mark & Karen Brunn  
 Harry Burgos  
 Matthew Burke  
 Terry Caipen  
 George & Bette Calvert  
 Vincent Capasso  
 Ronald & B. Susan Cassano  
 F. William Cazier  
 Robert & Michelle Chambers  
 Jinn-Kuen Chen  
 Palmer Chiu  
 John & Rosemary Churchill  
 Adriano Cirioli  
 Craig Coak  
 Richard & Jean Combs  
 John Cooley  
 M. Joseph & Jo Cork  
 Raymond Cosner  
 Gerry Daugherty



## School of Aeronautics & Astronautics Outstanding Aerospace Engineer Awards 1999

Over 350 people attended the first Outstanding Aerospace Engineering Award banquet held at the University Inn in West Lafayette on the night of October 21st, 1999. The school of Aeronautics and Astronautics became the focus of attention at Purdue, when thirty-nine Alumni returned to campus for the ceremony that honored fifty-eight engineers for their contribution to Aeronautics and Aerospace. The inaugural group of Awardees consisted of DEA's, HDR's and astronaut alumni from the School. Fourteen of Purdue's Astronaut alumni are graduates of our school. 🌐

Richard E. Adams  
 Neil A. Armstrong  
 Robert E. Bateman  
 Donovan R. Berlin (deceased)  
 John E. Blaha  
 Alvin L. Boyd (deceased)  
 William W. Brant  
 Roy D. Bridges, Jr.  
 Mark N. Brown  
 Elmer F. Bruhn (deceased)  
 John H. Casper  
 Roger B. Chaffee (deceased)  
 Milton U. Clauser (deceased)  
 William E. Cooper  
 Lana Couch  
 Richard O. Covey  
 Jack D. Daugherty  
 Richard L. Duncan (deceased)  
 Richard D. Freeman

Guy S. Gardner  
 Arthur B. Greenberg  
 Gregory J. Harbaugh  
 John B. Hayhurst  
 Walter J. Hesse  
 Paul T. Homsher  
 Robert D. Hostetler  
 H. Mike Hua  
 Richard E. Kasler (deceased)  
 Ronald L. Kerber  
 William C. Kessler  
 Walker M. Mahurin  
 Edmund V. Marshall  
 Garner W. Miller  
 John I. Nestel  
 James P. Noblitt  
 Wendell Norman  
 William J. O'Neil  
 Richard M. Patrick (deceased)  
 Gary E. Payton

Richard H. Petersen  
 Mark L. Polansky  
 James D. Raisbeck  
 Bruce A. Reese  
 Herbert F. Rogers  
 Leonard M. Rose (deceased)  
 Richard L. Rouzie (deceased)  
 Alfred F. Schmitt  
 Loren J. Shriver  
 Shien-Siu Shu  
 Lester W. Smith (deceased)  
 Walter D. Smith  
 Robert L. Strickler  
 David O. Swain  
 Martin W. Taylor  
 Richard W. Taylor  
 Janice E. Voss  
 Charles D. Walker  
 Henry T. Yang





**The inaugural class of Outstanding Aerospace Engineers.**



**President Steven Beering presents the distinctive OAE award to astronaut Dr. Janice Voss.**



**(From left to right) Jane Freeman and OAE recipients Walker "Bud" Mahurin and Dick Freeman**



**(From left to right) John and Brenda Blaha, and Sally and Gus Gustafson also attended 1999 OAE Banquet**



**Dean Richard Schwartz congratulates Dr. Edmund Marshall.**



**Three of Purdue's finest engineers, Dr. Walter Hesse, Dr. Richard Adams, and Dr. Herbert Rogers.**

Richard Davignon  
Duane & Georgene Davis  
Gregg Davis & Shawnda Townsend  
James Day  
Rhett Dennerline  
H. Rudolph Dettwyler  
Ted Dills  
William Disser  
Donald & Louise Doran  
George & Patricia Doyle  
John Drake  
Tony & Karen Dunlap  
William & Sally Dunton  
Roy Eggink  
W. Keith Everly  
William Faulkner  
Lee Favour  
Marty Ferman  
Nicholas & Laura Ferraiolo  
Evard & Barbara Flinn  
Brian Foist  
Kenneth Foley  
Anthony & Lorene Fortini  
William Frick  
Douglas & Kelly Frietchen  
John & Judith Gallman  
Guy Gardner  
James & Margaret Gearhart  
Ralph & Josephine Gilbert  
Gary Gilbreath  
Robert Gilson  
John & Roberta Gleiter  
Carl Gran  
James Gutknecht  
William Habelt  
Barbara Hackman  
Robert Hall  
O. Mark Hanner  
Thomas Hanson  
Jay Hardin  
Douglas Harlan  
Philip Harvey  
Robert & Genevieve Harvey  
James Hatfield & Kathy Crain  
William Haverly  
Norman & Susan Haynes  
Drew Hays  
William Herman  
Rikard & Brenda Hill  
Steven Hiss  
William & Ruthanne Holder  
Tracey Homburg  
John Horvath  
Martin & Jennifer Houghton  
Daniel Humbert  
Kenneth & Dorothy Hummel  
James & Lynn Hunsicker  
Raymond Hunt  
Joe Huss  
Ross & Christine Iacomini  
David Jarvis  
Chan-Jiun & Lih-Ji Jih  
David & Paulette Johnson  
David Johnson & Amy Cooprieder  
Kirk Johnson  
Jack Johnston  
Thomas Kaemming  
James Kaufman  
Charles Kaul  
David & Marsha Kelp  
Michael & Madeline Kennedy  
Czeslaw Kentzer  
James Knapp  
Severino Koh  
William & Mary Kroll  
James & Mary Kucaba  
Charles & Julia Lamb  
George Lang  
Henry Lang  
Stephen & Catherine Lawrence  
James & Marisa Leach  
Alan & Georgetta Ledger  
Charles Lee  
Michael Lena  
Stephen Liebke

*continued on next page*

Mark Lilley  
 Eric Lin  
 Patrick & Mary Lindauer  
 Richard Link  
 Louis Lintereur  
 Michael Longmeyer  
 Jianbo Lu & Sandy Shi  
 Kenneth Malecha  
 Robert Mattes  
 Harvey McComb  
 Kenneth McDowell  
 Robert McElvain  
 David & Darlene McGrath  
 William McHenry  
 Edward McNally  
 Ralph & Marilyn Merrill  
 Ronnie & J. Caroline Miller  
 William & Jennie Miller  
 Leo Millstein & Linda Finkelman  
 Stephen Mitchell  
 Eric Monroe  
 Jeffrey Moore  
 Daryl Morrical  
 Michael Moses & Natalie Stubbings  
 Mark & Carol Mosher  
 Frank Murdock  
 James & Reta Murphy  
 Terrence & Marianne Murphy  
 Francis Mushial  
 Martin & Martha Myers  
 Donald Nefske & Shung Sung  
 Harlan & Joanne Nelson  
 John & Polly Nelson  
 Michael & Martha Neussl  
 Douglas & Donaree Neville  
 Wendell & Kay Norman  
 Stephen Northcraft  
 D. Terrence O'Brien  
 David Ochiltree  
 Richard Offhaus  
 John Olsavsky  
 Michael & Susan Ondas  
 Joseph Ortiz  
 Robert Overdeer  
 Craig & Pamela Parry  
 Gary Payton  
 Clarence Perisho  
 Charles Plafcan  
 Henry Plouse  
 Jeffrey Pullins  
 Michael Pumilia  
 Brian Quinn  
 Jane Quirk  
 Steven Reed  
 Richard Richardson  
 Ronald Ridenour  
 Donald Rizzetta  
 Howard Rodean  
 Robert Rodgers  
 Peter & Judith Roth  
 Robert Roth  
 Burghard & Kay Ruterbories  
 John Saalwaechter  
 Charles & Betty Saff  
 Stanley Safranski  
 James Scheuer  
 Bill Schneider  
 Jeffery & Donna Schroeder  
 Ronald & Nancy Schwiesow  
 Wilfred Scull  
 C. Thomas Seeley  
 Denise Seeman  
 James & Malynna Silverthorn  
 Craig Simcox  
 David Skinner  
 James & Joanna Skridulis  
 David & Vivian Slosson  
 Robert Sommer  
 Marlon Sorge  
 Stephen Soukup  
 Tom Sprandel  
 Fredrick Staudt  
 Albert & Katherine Stefan  
 William Stokman  
 Raymond Stone

## DEA 2000 - Michael T. Kennedy




The faculty of the Schools of Engineering recognized the accomplishments of Michael T. Kennedy, B.S.A.E. '70, by conferring upon him the title Distinguished Engineering Alumnus in recognition of his outstanding professional achievements. The award was made on April 28, 2000 in conjunction with Gala Week activities.

Mr. Kennedy is Vice President, EELV/Delta IV Program for The Boeing Company. He is responsible for the total performance of this evolution of launch vehicles. The satellite communications and launch systems business is in a period of dynamic growth in both the commercial market and in the U.S. defense area. The result of his continued engineering expertise has enabled The Boeing Company and the satellite industry to address interesting technical challenges across a broad spectrum of engineering disciplines.

Mr. Kennedy has talents above and beyond his engineering skills. He received gold and platinum records and was awarded Song of the Year in 1974 for his composition of the hit song "Heartbeat, It's a Lovebeat," performed by the DeFranco Family. A true Renaissance Man!



## HDR 2000 - David O. Swain

David O. Swain, B.S.A.E. '64, DEA '93, OAE '99, was awarded an Honorary Doctorate in Engineering at the Spring 2000 commencement exercises. Dr. Swain is Senior Vice President of Engineering and Technology for The Boeing Company. His entire career in the aerospace industry is one of accelerated growth, phenomenal success and a passion for engineering. He has had a hand in many of the advances we have witnessed over the past 35 years of aerospace development and exploration. Dr. Swain's motto, "continuously learn," has shaped his decisions and demonstrated his love for education. 

## William E. Boeing Lecture


For decades, Purdue University and the Boeing Company have enjoyed a fruitful relationship leading to the realization of research laboratories, faculty initiatives and well-prepared employees for The Boeing Company. Specifically, the School of Aeronautics and Astronautics has benefited from resources, such as: the Boeing Wind Tunnel, Ludwig Tube and the McDonnell Douglas Composite Materials Laboratory.

To express our gratitude to The Boeing Company for its generosity over the years and to honor the memory of its founder, Purdue University has established the William E. Boeing Lecture Series, which is administered through the

school of Aeronautics and Astronautics. Hosted annually, the lecture series features a internationally-known speaker from the aerospace or air transportation industry.

The first annual lecture took place on September 30, 1999. Mr. Mike Sears, was the first speaker. He is the senior vice president of The Boeing Company and president of its Military Aircraft and Missile Systems Group. He is responsible for development and production of tactile aircraft, military transports, helicopters and tactile missiles. Also reporting to Sears is the Boeing Phantom Works Organization, which develops new products, technologies and process improvements for the entire Boeing Company.

Subsequent to the lecture, Mr. Sears became CFO of The Boeing Company. He holds both bachelors and master's degrees in electrical engineering from Purdue University and a master's degree in engineering management from the University of Missouri-Rolla.

With the installation of the Boeing Mach 6 wind tunnel and the new Boeing and Intel Design/Build/Test Laboratory, Boeing continues to help our aeronautical students receive practical "hands-on" experience. They are such an important part of our students' academic program that it is hard to remember a time when they were not available for faculty and students to use. 



(Left to right), Professor Tom Farvis, Mike Sears, Bob Bateman, former Boeing VP, AAF'46, Dean R.J Schwartz.



Mike Sears

## Haitian Art Adorns Black Cultural Center

Dr. Harold DeGroff, a retired Aeronautical Professor and former head, and his wife Sally donated a valued piece of Haitian art to the Black Cultural Center in February 2000.

DeGroff, during his tenure at Purdue taught several of NASA's astronauts including first man on the moon, Neil Armstrong, before retiring.

The painting is a piece done by the late Bernard Sejourne (1974-1994) who is considered one of the leading contemporary artists of Haiti.

The piece donated to the center is entitled "Femme Aux Tissage", which translates "Woman with weaving" The painting will be on permanent display in the center's 1100 3rd Street location.

Paul Stover  
Arthur & Jane Strathman  
Stephen & JoAnn Stukel  
Daniel & Kim Suffoletta  
Daniel Swanson  
Jeremy Tack  
Norman Tangedal  
Herman Tarnow  
Charles & Lucile Taylor  
Lloyd & Nancy Taylor  
Norma Taylor  
John & Lois Thomas  
Richard & Roberta Thomas  
Francis Thompson  
Ronald Tolbert  
James Trask  
Andrew & Marilyn Trenka  
Paul Ullrey  
Kirk & Barbara Valanis  
Paul Vinson  
Daniel & Jennifer Vonderwell  
David & Susan Wagie  
Roger Wahl  
Charles & Susan Walker  
Gregory & Caren Walker  
Richard Warns  
James Wells  
Gary Wheeler  
George Wiemer  
James Willen  
Richard Williams  
Craig Wolfson  
Bernard Wontorek  
Troy Wright  
David & Carol Yates  
David Young  
William Yutmeyer  
Arthur Zimmerman

### LESS THAN \$100

Bruce Allen  
Michael & Susan Allen  
Robert & Martha Alter  
Jason Anderson  
Nancy Anderson  
Paul Andrews  
Dominick Andrisani  
Vernon Arne  
Matthew Arnett  
John Arnold  
Noel Ashbaugh  
Darryl Asp  
Larry Autry  
Phillip Baggett  
Roxy Balian  
Thomas Bander  
Celso Barcelos  
Frank & Saada Barfod  
Lisa Barker  
Arthur Barrett  
Frank & Janet Bauer  
Robert Bayt  
Eric & Sally Bentley  
Edward Bernstein  
John Biermann  
Roger Biggs  
William & Martha Bigler  
Anita Bigonesse  
Stanley Bissey  
Robert & Christina Black  
Jeffrey & Kathleen Blank  
Carl Blechschmidt  
Joseph Bloom  
Joseph & Martha Blum  
William Bolles  
Bradley Bolster  
Mark Booher  
Robert Boswinkle  
John & Marjorie Bowman  
Roger Branson  
Kurtis Breiling  
Eric & Tracy Brethauer  
Richard Breunlin  
Harry Bristol  
Thomas Bruce  
William Bucher

*continued on next page*



Robert & Patricia Bueker  
Charles & Cathy Burns  
Steven Buzon  
Richard Byam  
Robert & Dolores Byrne  
Phillip & Miriam Callner  
Robert Campbell  
Mark Carmel  
Timothy Carnahan  
Darrell Carney  
Nelson Carter  
Jack Cearing  
Wen-Sheng & Yang-Hwa Chan  
Richard & Joan Chapel  
Chih-Tsai & Heng-Jen Chen  
Glen & Dolores Childress  
Charles Christman  
David & Anita Clegg  
Debra Cmar  
Edmund & Jeanne Conklin  
Melvin Corbett  
Steven & Louise Crago  
James Crane  
Larry Crawford  
Lyle Crist  
Walter Croker  
Harold Croop  
William Curdis  
George & Mary Cusack  
Scot Dahl  
Lyle & Laura Dailey  
G. Blaine Darrah  
Clifford Daugherty  
Dean & Ethel Davis  
Jordan De Namur  
William Denny  
Jonathan Devilbiss  
Charles Dewitt  
Kevin DePaola  
John & Diane DeWald  
Bryce Diamant  
Mark Director  
Scott & Karen Doebeling  
Mark Doerfler  
David Downing  
Robert Duesler  
Jennifer Dumit  
Gregory Dunn  
Michael Duzak  
James & Rae Eastwood  
Charlotte Edinboro  
Edward Elbert  
Frank Elliott  
Gedalyah & Marilyn Engel  
Nancy Felten  
Paul & Krystal Ferguson  
William Ferrell  
Bruce & Carol Fetz  
Mark Feuerstein  
James Fields  
Bradley & Beth Files  
John & Barbara Findley  
Robert Finkbeiner & Kristi Graham  
Abraham Flatau  
Wendell Fleener  
William & Evelyn Fleming  
James & Tammy Fong  
Ping Fong  
Robert Forbes  
Evelyn Forsgren  
William Fouts  
Tim Frahm  
Robert & Elizabeth Frederick  
Joseph & Elsie Freeland  
Donald & Karen Frye  
Brian & Amy Fultz  
Kurt & Virginia Galle  
Joseph Garrahan  
Frederic & Kathryn Gates  
Russell Gates  
Thomas & Nancy Gaudion  
Robert Geralde  
Dale Gerken  
Bruce Gessley  
George & Renee Goranson  
Curtis & Dollaretta Gordon

## CLASS NOTES

Listed below in our *Class Notes* section are updates about your fellow alumni and friends. If space permits, we will try our best to publish almost any short update you send to us. To submit information for the Fall 2000 edition of *AeroGRAM*, please complete a *Class Notes* information update form, located on last page.

### 1950's

**James Dosman**, BS '54 - is retired and enjoys traveling with his wife, Nancy. He recently received a patent No. 586,318,8, for a Fluid Flow Reducer (Fluid Pressure Booster) on January 26, 1999. The invention does relate to a Dynamic Fluid Transformer and a Fluid Transmission.

**Paul E. Ramsey**, BS '58 - Retired from NASA /Marshall Space Flight Center as an Aerospace engineer on January 2, 1999 after 40 1/2 years of service. He was team leader for an aerodynamic experimental test team and also served as Aerophysics Branch operations manager for the cold flow experimental test facility complex. He was responsible for the procurement of test models and test hardware to be tested in the Branch facilities. He has been married for 41 years to Nancy Ellen (Smith) Ramsey, originally from the Battleground IN area. He has five children, five grandchildren and one great granddaughter. He moved, 13 years ago, from Huntsville, AL to Limestone County, AL and lives on a 25-acre farm. Current address is 24895 The Lane East, Athens, AL 35613.

### 1960's

**Donald D. Gray**, MSE '69, Ph.D. '74, - is Associate Professor and Group Coordinator for Environmental and Hydrrotechnical Engineering in West Virginia University in Morgantown, West Virginia. His book "'A First Course in Fluid Mechanics for Civil Engineers" was published in January 2000, by Water Resources Publications, LLC. Information about the book is available at: <http://www.wrpllc.com/fcfm.html>

**Gary Mitchell**, BS '60 - is Vice President Europe Operations for Boeing Aircraft & Missiles. Known to most as Bud. Bud and his wife Rosemary (White) HE '60 are presently living in London, England. Bud previously was Vice President Program Manager F/A-18E/F at Northrop. Bud became Vice President General Manager F/A-18C/D before assuming international responsibilities.

### 1970's

**Patrick F. Dunn**, BS '70, MS '71, Ph.D. '74 - is a professor in the Department of Aerospace & Mechanical Engineering at the University of Notre Dame. He recently was appointed Director of the Hessert Center for Aerospace Research at Notre Dame. He still keeps close ties with Purdue through his three children, all Purdue engineers: Christopher (BS Interdisciplinary Engineering and Economics '99), Andrea (Interdisciplinary Engineering - Class of '00) and Brian (Freshman Engineering - Class of '03).

**Michael J. Corso**, BS '71 - The Florida Bar as a board has, recently recognized a senior shareholder with the Fort Myers, Florida, law firm of Henderson, Franklin, Starnes & Holt, P.A., certified business litigation lawyer. Corso, also a board certified civil trial lawyer, concentrates his practice in the defense of non-medical professionals (engineers, architects, accountants, and lawyers); product liability defense; environmental, pollution, hazardous waste and toxic tort defense; and general tort defense.

**John M. Koke**, BS '74 - is a 5th grade teacher. In addition to his teaching responsibilities he is the technology coordinator responsible for assisting the teachers in the use of electronic technology in their classrooms.

### 1980's

**Sam W. Thurman**, BS '83 - is flight operations manager for NASA'S Mars Surveyor '98 mission. The Mission is composed of two different spacecraft: Mars Climate Orbiter, launched on December 11, 1998, and the Mars Polar Lander, launched on January 3, 1999. Both spacecraft are safely in route, arriving on September 23 (Orbiter) and December 3 (Lander).

**Jonathan DeVilbiss**, BS '84 - is a reliability analyst in the maintenance and engineering department of Hawaiian Airlines in Honolulu, Hawaii, and admits some of his pay is in the form of sunshine.

**Bryan Booze**, BS '86 - is with Aerospace & Defense Specialist for Conley, Canitano and Associates, Inc. (CCAI). CCAI is a management consulting firm specializing in ERP system implementations.

**John Murphy**, BS '89 - Currently is employed as a Sr. Specialist Propulsion Engineer at the Boeing Co. On April 25, 1999, John married Shirley McChesney. New address as of May 1 is 2827 NW 75th Street, Seattle, WA 98117.

### 1990's

**P. Andrew Blatt**, MS '90, PhD '93 - has joined the firm of Wood, Herron & Evans, L.L.P. The firm specializes in intellectual property law.

**Elizabeth Blok (Sack)**, BS '91, MS '94 - is presently employed with NASA as a Space Shuttle flight controller in Houston, TX.

**Charity Hampton Lawson**, BS '96 - is with TRW in the Propulsion Systems Engineering Department in Redondo Beach, CA. As part of Charity's LA Section AIAA activities, she was awarded the First Place Newsletter Award in the Very Large Category. On February 21, 1999, she was also named as a fellow for IAE. Charity and her husband welcomed into their family a daughter, born on December 2, 1998.

**Matthew Gault**, BS '97 - is a Boeing logistics engineer for the International Space Station in Houston, TX.

**Cindy Mahler**, BS '98 - is working at United Space Alliance and has been certified to teach her first class lesson to flight controllers and astronauts. She is a space station guidance, navigation, central and propulsion instructor.

**Tara Rishko**, BS '91, MS '92 - graduated from Stanford University in September 1999 with an Engineer's Degree in Aeronautics and astronautics. She is a market analyst for MyWebivity.com, an Internet startup company in Mountain View CA.

**Matthew Scott Schoenherr**, BS '98 - made his first trip to Russia in January 1999. He worked with the Service Module (next ISS element). He is the EVA Project Office lead for this module.

## Our sympathies

Since the spring 1999 issue of AeroGRAM the following alumni of the School of Aeronautics and Astronautics have been reported as deceased. The faculty and staff of the School extend our sympathy to all family members and friends.

Horace E. Dimond BS, '48

William A. Fleming BS, '43

Durward Kirby, Former student, '34

Homer G. Morgan BS, '52, MS, '55

Richard Lee Rouzie BS, '28

J. Lyell Sanders Jr. BS, '45

November 1999

## USA names McCulley Chief Operating Officer.

**V**eteran shuttle astronaut and manager Michael J. McCulley has been appointed Chief Operating Officer (COO) of United Space Alliance (USA), the prime contractor for NASA's space shuttle program.

McCulley will be responsible for the day-to-day operations management of the 10,000-employee company, and will report directly to President and CEO, Russell D. Turner. He replaces Jim Adamson, who recently left the company to become president of Allied Signal Technical Services Corporation.

Since 1997, McCulley has served as vice president and deputy program manager for the space flight operations contract at USA, playing a key role in the management of contract elements in Florida, Alabama, Texas and California.

Upon joining USA in June 1996, McCulley served as the vice president and associate program

manager for ground operations at the Kennedy Space Center in Florida. There, he was responsible for directing the integration of all processing activities associated with the space shuttle program.

A retired U.S. Navy captain and former NASA astronaut who logged more than 119 hours in space, McCulley piloted the highly successful STS-34 shuttle mission. The October 1989 flight featured the deployment of the Galileo spacecraft on its decade-long journey to explore Jupiter and its moons.


After leaving NASA and the Navy in October 1990, McCulley was employed by Lockheed Martin Space operations and served as vice president and deputy launch director in November 1995, before joining USA in 1996.

A graduate of the Lockheed Executive Institute, McCulley holds numerous governmental awards and




Michael J. McCulley

decorations including the NASA Public Service Medal, NASA Space Flight Medal and the National Management Association Silver Knight of Management Award. He is also the recipient of a special proclamation for his service to the state of Florida and the nation from Florida Governor Lawton Chiles.

McCulley earned both his bachelor's and his master's degrees in metallurgical engineering from Purdue; he received his Navy commission in 1970 and has served as a Navy test pilot and has logged over 5,000 hours in more than 50 types of aircraft. 

Patrick Graber  
Stanley & Nancy Green  
Maurice Griffin  
Larry & Helen Gruber  
John & Margaret Maher  
Stephen Hahn  
Edward Haletky  
Rolf Hamke  
Brian Harrington  
Walter Harrison  
Kimberly Hay  
Karl Hellman  
Theron Henry  
Richard Hiernaux  
James & Helen Hildebrandt  
John & Isabel Hindmarch  
Norman Hines  
George Hirko  
John Him  
Douglas Hodges  
Brett & Rita Hoffstadt  
Burton Holaday  
Jerry Holman  
Robert Holt  
Richard Hooper  
Jon Hoops  
Richard House  
Anren Hu  
Clayton Huben  
Scott & Eleanor Hucker  
Paul Hughes  
Sherman Hughes  
John & Albina Hunter  
Stephen & Jennifer Hurst  
William Huston  
Samuel Hutchinson  
George Irving  
Norman & Sady Ishimoto  
Dean Jablonski  
Robert & Cynthia James  
Roman Jamrogiewicz  
Stacey Jasinski  
Lowell John  
Edwin Johnston  
Ross & Ana Jones  
Hans & Jo Karrenberg  
Raymond Kartasuk  
Rama Katari  
Larry Kellogg  
Paul Kelly  
Robert Kielb  
Herman Kietzman  
Byoung Do Kim  
Dawn Kinsey  
Robert Kissinger  
William Klint  
Eldon Knuth  
Kevin & Crystal Kokal  
Douglas Kooker  
Fredrick Kraus  
John Krehbiel  
Jeffrey & Christine Kress  
John Kustura  
Edwin Lamb  
John & Shirley Larrison  
Anna Laub  
Michael & Rueann Laughlin  
William & Brenda LaManna  
Charles & Aino Leedom  
Ralph Lehman  
C. Richard Lenglade  
Laura Letellier  
Oscar Levi  
David & Caroline Lewis  
Basil & Diane Long  
James & Diane Long  
Amy Lucas  
James & Karen Luckring  
Gerald & Kathryn Lukavich  
Ty Marinen  
Clyde Matthews  
Joseph & Lisa Matucheski  
James & Stacey McCarthy  
William McColgin  
Robert McCoy & Lori Garner

## Gary & Sue Payton Engineering Scholarship

**F**ormer astronaut and Purdue alumnus Gary Payton (M.S.A.E. '72) and his wife Sue have endowed a scholarship with a gift of \$20,000 to help out-of-state students earn their engineering degree from the School of Aeronautics and Astronautics. The idea for this type of assistance came about as a result of their daughter Courtney's college search. The Paytons, residents of Virginia, traveled to many universities and realized the difficulty for many students to afford out-of-state tuition. To help these students attend Purdue's School of Aeronautics and Astronautics was the goal of the scholarship fund. And it's already paying off. Although the endowment would not generate an award for this academic year, the Paytons made an additional gift to enable a student to return to Purdue for his sophomore year. Their generosity is paying off. 

continued on next page



# Astronauts Come Home

1999 marked the 30th Anniversary of the first moon landing and Neil Armstrong's "Giant Leap" for mankind. To celebrate the occasion, eighteen Purdue Astronaut alumni returned to campus for Special President's Council Weekend.

The event was held as a thank you from Purdue and so the astronauts could pay tribute to the school that helped made their dreams a reality.

The weekend included the Outstanding Aerospace Engineer Awards Banquet, hosted by the School of Aeronautics and astronautics. The weekend of Thursday, October 21st through Sunday, October 24th, was just the second time such a reunion of astronauts took place. All but one of Purdue's living astronauts returned for the special event. Mary Ellen Weber was unable to attend because of her preparation for an upcoming space shuttle mission.

One of the opportunities students had to meet and converse with the astronauts was at a book signing by Gene Cernan, the last man on the moon. At a series of discussions, Cernan also spoke with students and the general public in the Purdue Memorial Union.

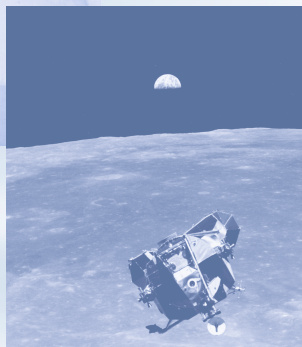
Some astronauts even made appearances at certain schools on campus as part of a "Back to Class" series of lectures. During these discussions the astronauts shared their career experiences and stories of their days at Purdue.

Part of the reason that Purdue became such a great University for future astronauts can be attributed to their unique program with the United States Air Force during the 1960's and 1970's. The program provided future astronauts an opportunity to earn a degree in astronautics a fairly new field in those days.

The astronauts reunion also included "Breakfast with the President" and the Schools of Engineering Luncheon on Friday, and the President's Council Pre-game Buffet on Saturday. The highlight of the weekend was the introduction of the astronauts to an enthusiastic and grateful crowd during a special half time presentation at the Purdue-Penn State football game.

For the astronauts and, students alike, it was truly an experience they will never forget. It was Purdue that started them on this journey and it is Purdue that will be there with them every step of the way.

*Extracts of this article first appeared in The Debris 1999-2000 written by Kelly Lucas*



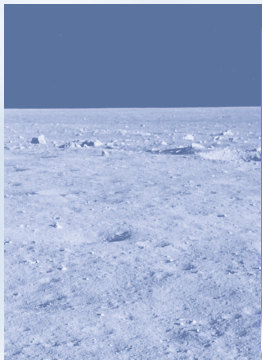
## "One Small Step for Man"



# “One Giant Leap for Mankind”



(Photo left to right) **Top row:** Roy D. Bridges Jr., John H. Casper, John E. Blaha, Mark N. Brown, Guy S. Gardner, Michael J. McCulley, Gregory J. Harbaugh, Mark Polansky, David A. Wolf, Loren J. Shriver (Bottom Row) Janice E. Voss, Jerry L. Ross, Eugene A. Cernan, President S. Beering, Neil A. Armstrong, Donald E. Williams, Richard O. Covey and Charles D. Walker



Ralph McElheny  
 David & Elizabeth McKinley  
 Philip McKown  
 William McNulty  
 John Medley & Lynn Jurs  
 David Meek  
 Walter & Myrtle Melloncamp  
 Lloyd Meyer  
 Scott & Barbara Meyer  
 Raymond Milberg  
 Christopher Miller  
 Gregory & Susan Miller  
 Jeffery Miller  
 Marvin & Ardath Miller  
 Merlin & Carlotta Miller  
 William Miller  
 Robert Milling  
 Richard & Margaret Mitchell  
 Richard Moll  
 Michael Moore  
 Robert Moore  
 William Moses  
 Charles & Margaret Muhl  
 Kenneth Murphy  
 Lewis & Mary Murphy  
 Kenneth & Shirley Naab  
 Gary & Deborah Naville  
 Wallace Nelson  
 Robert & Anna Newill  
 Gregory Norris  
 Nicholas Nylec  
 William & Rita Oates  
 Frederick Olafson  
 Charles & Teresa Orkiszewski  
 Mark Orr  
 Ryan & Christine Paige  
 Linda Palomar  
 Edward Parker  
 Robert Pendley  
 Frank & Maria Perry  
 Douglas & Cathy Peterson  
 David Petri  
 Wayne Pierson  
 Michael & R. Heather Planey  
 Shivshankar Prasad  
 Richard & Sheila Ptacin  
 Joseph & Lois Ramsey  
 Daniel Raymer  
 Walter & Roberta Reddall  
 Carl & Nancy Reiber  
 Robert & Helene Reid  
 Linda Remson  
 James & Carol Renna  
 Arthur & Agnes Richter  
 Lee Ross  
 Brent Roth  
 James Russell  
 Robert Russo  
 Robert Rutkowski  
 Mark Rutz  
 Karl Saal  
 Donald Sandercock  
 William Sanderman  
 Michael Sanders  
 James Saultz  
 A. Daniel Schnyer  
 Matthew Schoenherr  
 Edwin & Judith Scholz  
 Steven Schultz  
 William Schultz  
 Paul Schulz  
 Michael & Elizebeth Schura  
 Mark Sensmeier  
 J. Dugan Shelby  
 John Shuter  
 Gregory Siewiorek  
 Laverne Simonin  
 Earl Simpkins  
 Jon & Gwendolyn Sims  
 Eric Sittner  
 Charles Skira  
 Barbara Slaiby  
 Louis & Mary Slimak  
 David & Dianne Smith  
 Joseph Smith

## Aero Advancement

Hello. I'm Tim Bobillo, the Director of Development for the School of Aeronautics and Astronautics, since September 1999. So this issue of AeroGram covers my first year on the job! Well, that's not the focus of the issue...but I was here for all of it!

I am delighted to be here. This last year has been extremely fulfilling for me and for our School. For me it has been an opportunity to meet some wonderful new friends, (our alumni, faculty, students and staff), to be involved with the establishment and organization of some exciting new events, (Boeing Lecture, Industry Day, OAE Banquet), and to "come back" to Purdue. (Although I never really left).

I've been around Purdue in some manner for a hundred years, or so. I hold degrees in Supervision and Communications, and have worked in training, television, and telecommunications sales. These experiences, and my passion for Purdue carry me into this new career.

Communication. Alumni Relations. Event Planning. Fundraising. These are the key elements of the Development, or Advancement, professional. This past year I've been heavily involved in all aspects of my new career.

The one area that is so important and needs constant attention is communication. Improved communication is our goal. You may have noticed that AeroGram hasn't been published for some time. But it's back, and it's bigger than ever. This issue will bring you up to date on the happenings in the School



Tim Bobillo

for the 1999 - 2000 academic year. So some of the material may seem dated. It is. But it's the most interesting, dated material you'll ever read.

We will publish annually so as to include an entire academic year in each issue. Your next copy of AeroGram, and following editions, will be mailed in August

The real focus for me as the Advancement Director is fundraising. In Professor Farris' message he writes of some significant developments at Purdue. The first is the Engineering Master Facilities Plan (EMFP), a plan that will increase by 60% the space available for education and research. This will have an impact on our School for the next 50 years.

Related to fundraising and the EMFP is the naming of Dr. Martin C. Jischke as President of Purdue University. In Dr. Jischke's first semester on campus he has demonstrated a remarkable gift for fundraising. He recognizes the importance of increased resources in providing the right environment for academic success to occur. He is dynamic in presenting his message, our message. I feel energized to be a part of the team that will bring the Engineering Master Facilities Plan to fruition. You, too, will be excited when you see and hear the plans for Engineering, and especially for the School of Aeronautics and Astronautics.

Now let me tell you about a few outstanding examples of philanthropy.


James (B.S.A.E. '61) and Sherry Raisbeck established the Raisbeck Engineering Distinguished Professorship for Engineering and Technology Integration with a tremendously generous gift of \$2,000,000. Thank you.

John Rich (B.S.A.E. '54) with a gift of \$250,000 endowed the John and Patricia Rich Scholarship/Fellowship Fund. Thank you.

Mrs. Kiahswang Lo, the widow of Professor Hsu Lo, made a wonderful gift of over \$100,000 to begin the Hsu Lo Fund, a scholarship honoring her husband, the former head of the School. An additional \$35,000 was added to the Fund through the generosity of friends and former students of Professor Lo. Thank you.

Gary (M.S.A.E. '72) and Sue Payton established the Gary and Sue Payton Engineering Scholarship with a gift of \$20,000, and then supplemented their gift, before their endowment would generate an award, in order to help a student this year. Thank you.

Anne E. Belfort (M.S.I.M. '76), to honor her mother Anne D. Belfort (Ph.D. Psychology), established the Dr. Anne D. Belfort Fund with a gift of \$23,000. Thank you.

Support of our School is ever increasing. Each year more money is donated by more of our alumni. All of the support we receive from our alumni and friends is important and appreciated. You make us better. Thank you. 

# And the Winner is...

Congratulations to the following students who earned top honors this year.

The following students earned awards

## AAE 251 Thiokol Space Awards for fall 1998

First Place Winners

\* Chris Curtis \* Loren Garrison \* Jake Grasmick \* Darcey Kuhn \* John Matlick

\* Shin Matsumura \* Shuvo Mustafi \* Glenn McGary \* Wiyan Wong

## 1999 Boeing Scholarship

Congratulations to Thomas Hoverman and Nick Wellner for being selected to receive the 1999 Boeing Scholarship for the 1999-2000 academic year. Our faculty takes great pride in the accomplishments of our students.

## 1999 - John V. Breakwell Student Travel Award

Congratulations to Brian Barden who was selected to receive the John V. Breakwell Student Travel award. The Space Flight Mechanics Committee of the American Astronautical Society conferred this award on Brian. It was made in recognition of his excellent academic achievement and his research of spacecraft formation flying. With this award, Brian was able to attend the 1999 Astrodynamics Specialist Conference in Girdwood, Alaska in August 1999. During the conference, Brian presented his paper "Formation Flying near the Sun-Earth/Moon L1 point"

Congratulations to the following students who have won top honors.

**1998 Sigma Gamma Tau Outstanding Senior Award** - Abigail Dobbins.

**1999 Elmer F. Bruhn Undergraduate Research Assistantship** - William B. Stein

**1999 Herbert F. Rogers Scholarship** - Daniel Javorsek II

**1999 William Koerner Scholarship** - Brandon Abel, Jeffrey McCormick, Chad Blodget, Nicole Key, Andrew Peters, Tyson Struzenberg, Daniel Javorsek II, John F. Matlick.

**1999 Magoon Teaching Assistant Award** - Jason Bowman, Laurie Mailhe, Eric Campbell, Belinda Marchand.

**2000 Magoon Teaching Assistant Award** - Trisha Beutien, Michael Melchior, Govindarajan Kothandaraman, German Porras Alonso

**2000 Purdue Society of Professional Engineers Outstanding Senior Engineer Award** - Nicole Key

**2000 Elmer F. Bruhn Undergraduate Research Assistantship Winners** - Matthew Basiletti, Michael Jungquist

**2000 Herbert K. Rogers Scholarship** - Stephanie Van Y, Steven Wulf

**2000 William Koerner Scholarship** - Douglas Crook, Damon Landau, Brandon Abel, Jeffrey McCormick, Nicole Key, Shin Matsumura.

**2000 Purdue Student Engineering Foundation Outstanding Engineer Award** - Nicole Key

**2000 Sigma Gamma Tau Outstanding Aerospace Engineering Student Award** - Nicole Key (Purdue, regional, and national award winner)

**Purdue Forever Fellowships** - David Fanjoy and Patrick Golden

**NASA JSC Co-op Special Achievement Awards and Co-op Flag Awards**

Continued on the next page

Michael Smith  
Thomas & Mary Smith  
Thomas Smith  
James Smoak  
Carl & Angela Soderland  
Gerald Spade  
Michael & Norma Spak  
William Spargur  
David Spencer  
C. Anton & Candise Sprangers  
George & Ellen Staab  
George & Joan Stalk  
Richard Stammerjohn  
James Stanard  
Laura Stanjevich  
Jay & Lorraine Stanwood  
Guy Steeves  
Richard Steffey  
Brian & Janet Stephens  
Mark Stevens  
James Sunkes  
Andrew Swanson  
Dale & Susan Swarts  
Thomas Szabo  
William Tamblyn  
Xuefeng Tao & Yi Xu  
Ralph Tate  
Randall Tatman  
Mark & Donna Thomas  
Thomas Thompson  
Wayne Thompson  
Sam & Lisa Thurman  
Marshall & Sandra Tobias  
Stuart & Marilyn Treon  
Richard & Christine Trowbridge  
Frank & Donna Tse  
Joseph Tyler  
Kenneth Uffelman  
Gary Ullestad  
James Vail  
Ronald & Suzanne Valle  
John VanderHoven  
Joseph VanAtta  
Julie VanDerZanden  
James & Elizabeth Vardaman  
Daniel & Clarice Vasicek  
John & Marcia Vian  
Dan Vicroy  
Michael & Karen Visich  
Neil & Debra Walker  
Larry Walter  
Leon Walters  
Rhonda Walthall  
Donald & Mary Waltz  
John Wang  
Donald Ward  
Roger Ward  
Gerald Warner  
Thomas Webb  
Jack Weber  
Donald & Jean Webster  
Arthur & Barbara Weiss  
Adam Weston  
Richard Wetzel  
John Wheeler  
Harrison & Miriam Whippo  
Stephen & Heather Whiston  
Sheri White  
Robert Whitlock  
John Wiese  
Arthur & Arden Wiggins  
Thomas Willard  
Jack Willer  
Ralph & Carol Williams  
Thomas Williams  
David Wirkkala  
Stephen & Barbara Wise  
William Woebkenberg  
Gregory Wood  
Huafang Xu  
Jerry Xu  
Peter Yost  
Richard Young  
Melvin & Eleanor Youngblood  
George Younger  
Steven Zakem



### Student Awards continued

Congratulations to Casey Kirchner, Mandy Rogers and Pooja Agrawal for receiving the JSC Co-op Special Achievement Award in recognition of outstanding achievement. The award included a check for \$500.00

Congratulations also to John Gowan, Paul Brower and again to Casey Kirchner and Mandy Rogers who were awarded the JSC Co-op Flag Award. In addition to a certificate, they both received a mounted flag that has flown onboard an Orbiter.

Out of more than 90 students who worked at JSC in the summer of 1999, 32 were nominated for an award, of those nominated 18 received Special achievement Awards and 10 received Flag Awards.

### AAE 251 Thiokol Space Award for fall 1999

First Place Team

\* Paul Brower \* Matt Gean \* Patrick Kennedy \* Rob Navarro \* Wael Nour \* Dan Wodtke

### 1999-2000 Space Shuttle Memorial Fund Scholarship

Congratulations to Rebecca Anne Gick in being selected to receive the 1999-2000 Space Shuttle Memorial Fund Scholarship. Anne is to be commended for being selected this high profile scholarship.

### 2000 AIAA Regional Student Paper Award Winners

Congratulations to three of our School's students have received paper and awards at the 2000 AIAA Regional student Paper Competition.

\* Steve Frolik, Graduate category, 1st place \* Matthew Long, Graduate category, 3rd place

\* Shin Matsumura, Undergraduate category, 1st place

## Sigma Gamma Tau Outstanding Senior Award

Each year the Aeronautical Honorary Society, Sigma Gamma Tau, sponsors the outstanding senior award. The faculty selects the five nominees and the Outstanding Senior is selected by a student vote. The recipient of the 2000 Sigma Gamma Tau Outstanding Senior Award is Nicole Leanne Key.

The outstanding senior nominees were Theresa Jane Debban, Matthew Kenneth Kowalkowski, Derek Shane Liechty and Tyson Wade Strutzenberg.

#### Distinguished Students

Paul Michael Brower	Melissa Dawn Glaser	Mark Jared Knott	Kevin Joel Mfiller	Steven Scott Rucker
Brandon Ross Abel	Benjamin Stuart Cardinal	Sarah Louise Guthrie	Quinn Gluek Miller	Shawn Arlin Russell
Pooja Agrawal	Enrique Oscar Chapoy	Donald Craig Hwnitton	Shouvanik Mustafi	Nicholas Hanna Saadah
Linoy Vaghese Alex	Kuan-Hua Joseph Chen	Yoske Hosebe	Lauren Christine Naessens	Nattaporn Sangngmnpa
Amanda Beth Allen	Douglas D. Crook	Keith Russell Hout	Elizabeth Maria Newsome	Michael Wilheims Schreiner
Hirokazu Asano	Benjamin Michael Curtiss	Thomas John Hoverman	Michelle Rae Nokes	Jamie D. Shultz
Stephen C Bash	Theresa Jane Debban	Nathaniel Lee Huber	Kristen Leigh Panzenhagen	Colin Donnelly Sipe
Matthew Peter Basiletti	Jonathan Michael Edwards	Adam G. Irvine	Andrew Alan Peters	Ryan Eugene Srogi
Christopher Elliot Bates	Hunter Philip Eggink	Michael Joseph Jungquist	Christopher Peters	William Benjamin Stein
Luca Francesco Bertuccelli	Joel Andrew Falardeau	Rebecca Marie Kacvinsky	James Thomas Pinyerd	Tyson Wade Strutzenberg
Oneeb Ahsun Bhutta	Bridget Maureen Fitzpatrick	Masaki Kakoi	Paul Joseph Precoda	Michael Gregory VanMeter
Emily Elizabeth Birkhauser	Thomas John Fosness	Tulin,4. Kayir	Brian Christopher Prock	Mahammad Wang
Greg A. Bishoff	Loren Armstrong Garrison	Patrick Joseph Kennedy	Daniel Joseph Radocaj	Nicholas John Wellner
Chad Jeffery Blodget	Kristin Lynn Gates	Nicole Leanne Key	Brian Allen Rettenour	Andy Wiratama
	Matthew Christopher Gean	Casey Kafta Kirchner	Munir A. Merchant	Jeffery Eugene Rodrian

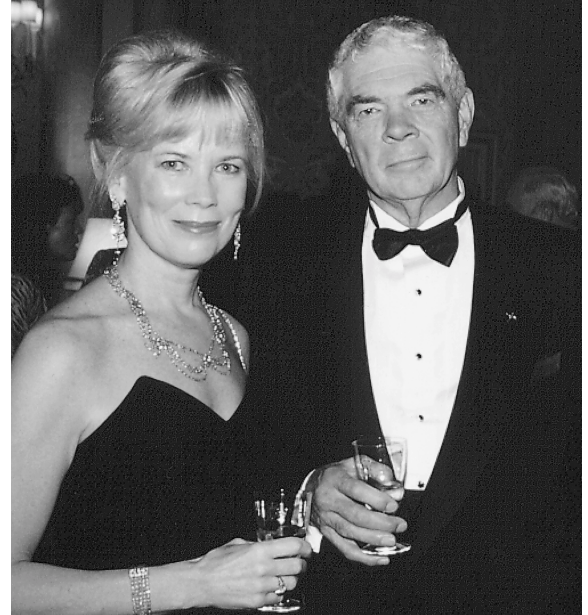
## The Raisbeck Engineering Distinguished Professorship

# The Raisbeck Engineering Distinguished Professorship for Engineering and Technology Integration

**J**ames D. Raisbeck (B.S.A.E. '61, DEA '79, OAE '99) and his wife Sherry L. Raisbeck, have given Purdue University \$2,000,000 to establish the Raisbeck Engineering Distinguished Professorship for Engineering and Technology Integration. The agreement between the Raisbecks and Purdue stipulates that the Distinguished Professorship "will bridge the School of Aeronautics and Astronautics and the Department of Aviation Technology to teach graduate and undergraduate students the art and science of mixing theory and application in the Design/Build/Test process. The process shall generally consist of teams working toward a common goal of an end product which is properly designed through theory and made practical through application."

Selection of the recipient will be made by the School of Aeronautics and Astronautics and the Department of Aviation Technology, with the approval of the Dean of Schools of Engineering and the Dean of the School of Technology, in accordance with the academic standards, policies and procedures of the University for designation of the academic title Distinguished Professor.

The Raisbecks, of Seattle, WA, are philanthropists of the highest order. The \$2 million gift to Purdue is part of \$13.2 million the Raisbecks donated in 1999 to a variety of philanthropic causes. Other beneficiaries include: \$1 million to Cornish College of the Arts, Mrs. Raisbeck's alma mater; \$1 million to the Seattle Opera; and \$1 million to the Pacific Northwest Ballet. 🌐



James and Sherry Raisbeck

## The Hsu Lo Fund

**M**rs. Kiahswang Lo, the widow of Professor Hsu Lo, former head of the School of Aeronautics and Astronautics, with a gift of over \$100,000, has established the Hsu Lo Fund to provide for scholarships and fellowships to students in our School, continuing the work that Professor Lo started when he came to Purdue.

In 1949 Hsu Lo and his wife, Kiahswang came to West Lafayette, Indiana to join the faculty of Purdue University. Hsu Lo began a long and productive relationship with the School of Aeronautics and Astronautics. He rose quickly through the ranks to full professor



Prof. Hsu Lo

and chaired the advisory committee of the School for two years before serving as Head of the School of Aeronautics and Astronautics from 1967 - 1971.

Over the course of his illustrious career Professor Lo earned a reputation as an outstanding teacher, scholar, leader, and friend. Professor Lo was twice voted Best Teacher in the School. He designed the first orbit mechanics course in the country. The first woman to receive an aeronautical engineering Ph.D. at Purdue was under Professor Lo's direction.

Mrs. Lo, through her generous gift to the School, has established an endowment to fund the Hsu Lo Scholarship/Fellowship Fund. Initially the income shall be used for Lo Scholarships for undergraduate students in the School. As the

endowment grows, the fund will be used to support graduate students in the School with fellowships. While fellowships are administered in accordance with Graduate School policies, preference will be given to students from China to honor Professor Lo's mentorship of international students. The endowment will continue into perpetuity and honor Professor Lo for his contributions to the School and for his tireless efforts to help so many.

**You may contribute to the Hsu Lo Fund by sending your gift to Purdue Foundation, Purdue University, 1801 Purdue Memorial Union, West Lafayette, IN 47907-9988.**

**Please indicate that your gift is for the Hsu Lo Fund on your check.** 🌐

# Faculty UPDATE



## Faculty Roster

### Professors

M.J. Corless  
J.F. Doyle  
T.N. Farris, Head  
A.E. Frazho  
A.F. Grandt  
K.C. Howell  
J.M. Longuski  
J.P. Sullivan  
C.T. Sun  
T.A. Weisshaar  
M.H. Williams,  
Associate Head

### Associate Professors

D. Andrisani  
G.A. Blaisdell  
S.H. Collicott  
S.D. Heister  
A.S. Lyrintzis  
M.A. Rotea  
S.P. Schneider

### Assistant Professors

W.A. Crossley  
J.J. Rusek

Congratulations to Professor James Doyle who received the 1999 M. Hetenyi Award from the Society for Experimental Mechanics for his paper titled, "A Wavelet Deconvolution Method for Impact Force Identification." This award was presented at the 1999 SEM conference, held in June 1999 in Cincinnati.

Also to Professor Thomas Farris and his student G. Harish who were presented with the ASME/Boeing Structures and Materials Award for their paper, "Effect of Fretting Contact Stresses on Crack Nucleation in Riveted Lapjoints." This paper was first presented at the 1998 AIAA SDM Conference and the award was presented at the 1999 SDM conference held in St Louis, MO in April 1999.

Professor William Crossley won both the Elmer Bruhn Teaching Award and the W.A. Gustafson Best Teaching Award.

Professor Kathleen Howell was named fellow of the American Astronautical Society.


Professor Terrence Weisshaar was on sabbatical leave as a visiting scholar and research chair for the Center of Multidisciplinary Technology, at Wright-Patterson Air Force Base during the Fall Semester.

Professor Stephen Heister was promoted from Associate Professor to full Professor of Aeronautical and Astronautical Engineering, effective from August 16, 1999.

The School hosted three research conferences during the year.

Professor John Sullivan served as coordinator of the 7th annual Pressure Sensitive Paint Workshop held at Purdue University in October 1999. The keynote speaker for the three-day program was Larry Lydick, (M.S. AAE) of Lockheed Martin.


Professor John Rusek and Professor Stephen Heister were coordinators of the 2nd International Hydrogen Peroxide Propulsion Conference, which was held at Purdue University in November.

The Center of Excellence in Materials Processing and Tribology presented the 3rd annual Manufacturing Processes and Tribology Workshop. 

## Nova Award - Europa Orbiter Trajectory Design Team

**F**all 1999 - Managers of the NASA Jet Propulsion Lab, Outer Planets/Solar Probe Project have awarded a NOVA award to the Europa Orbiter Trajectory Design Team, for innovative contributions to the trajectory design of the Europa Orbiter mission.

The NOVA (Notable Organizational Value-Added) Award is designed to acknowledge contributions to the achievement of the mission and goals of JPL and its organization. Professor James Longuski and his students Gene Bonfiglio (now at JPL) Andrew Heaton and Nathan Strange were all part of the trajectory design team. The managers also praised the work of Anastassios Petropoulos.

The full members of the team are as follows: Gene Bonfiglio, Dennis Byrnes, Louis A. D'Amario, Paul  Finlayson, Steven N. Flanagan, Andrew Heaton, Jennie R. Johannesen, James Longuski, Nathan Strange.



James Longuski



February 1999

## Heister Named University Faculty Scholar

Professor Stephen Heister was named as one of the University Faculty Scholars for the Schools of Engineering. Professor Heister, along with four other engineering professors, is the first of what will eventually become 13 University Faculty Scholars from the Schools of Engineering.


The University Faculty scholars (UFS) program is designed to recognize outstanding faculty colleagues who are on an accelerated path for academic distinction.

Each of the Schools of Engineering submitted nominations to a fac-

ulty committee whom then selected the finalists. These finalists were then forwarded to the University for approval. Professor Heister's appointment as a University Faculty Scholar is for five years and carries with it a \$10,000 stipend for use in supporting his University activities.

The criteria used to determine the recipients of the award include achievements to date and potential for excellence in achieving national and or international recognition and leadership and or entrepreneurial activities in research, teaching, and service activities.

Professor Heister was also the recipient of the Elmer F. Bruhn Teaching Award given in the spring 1999. The School administers the award and all undergraduate AAE students are eligible to submit nominations. This is the third time Professor Heister has received this honor, Professor Heister then went on to be the school's nomination for the engineering wide A.A. Potter best teaching award.

Congratulations to Steve on his recognition. It is always pleasing to see one of your own honored by their peers. 



**Stephen Heister**

**Congratulations  
Professor Heister  
and to all  
our nominees.**




**John Rusek**

## Professor John Rusek experiments to develop new fuel cell

**A** new fuel cell that is environmental friendly, runs on aluminum and renewable resources while also having the ability to generate 20 times more electricity per pound than car batteries. Sounds too good to be true, but AAE professor John Rusek and his students have been developing just that.

Electricity is produced from the cell by chemical reaction occurring between aluminum and Hydrogen peroxide. In November 1999, Prof. Rusek presented his poster paper about this research at the 2nd International Hydrogen Peroxide Propulsion conference, which he co-hosted at Purdue.

Hydrogen peroxide also offers the availability of developing non-toxic, low cost rocket fuels. If the fuel cell is perfected, the electricity source could possibly replace conventional batteries in many applications.

Unlike batteries, the experimental cells do not provide a steady supply of electricity. It takes about two hours for the cells to reach their peak electrical output enabling them to produce a steady current flow of power. 

# Fourth Annual Fall Space Day

By Lillie Fisher

Students, who attended the 4th annual Fall Space Day in November 1999, not only learned about astronautics, but also got a vocabulary lesson from Guest Astronaut Guy Gardener. "What adjective would you use to describe space flight?" he asked at the opening session. The responses were enthusiastic and varied: Awesome, scary, great, beautiful, super and so on. Gardner assured everyone that space flight was all of that and more.

Thanks to the work of an enthusiastic group of students from SEDS and AIAA, Fall Space Day, for mid north Indiana schooled children, grades three to eight, was held November 13, 1999. The purpose of the day was to encourage children's interest in space exploration as well as stimulate their interest in the fields of math and science. The event offered interactive, hands on experiments designed to help children discover their own interests and abilities. In the rocketry and propulsion session, students in grades six through eight used computers to study orbit trajectories, experimented with toys to learn basic physics concepts, and

participated in a simulated shuttle mission, complete with flight crew and flight controllers. Astronaut Gardner visited each session to talk with the students personally and answer questions.

Gardner, who had received an Outstanding Aerospace Engineering award in the inaugural awards ceremony on October 21st, earned his master's degree in aeronautics and astronautics at Purdue in 1969. He piloted space shuttle flight 27 in 1988 and served as pilot of shuttle flight 35 in 1990. He currently teaches Mathematics in Washington-Lee High school in Arlington, Virginia.

At a dinner to thank SEDS and AIAA volunteers, Astronaut Gardner recognized Fall Space Day chairman Sherri Spreadbury and the volunteers for an excellent program and encouraged them to continue to aim high.

Fall Space Day was sponsored by AlliedSignal, Inc., NASA Indiana Space Grant Consortium, United Technologies Corporation, The School of Aeronautics and Astronautics and the family of the late Michael J. Burke.

## Congratulations National General Aviation Design Competition Winners.

A Purdue University team of AAE students, under the direction of Professor William Crossley, won 2nd place and a prize of \$2000 in the National General Aviation design Competition for its design of a six-passenger, high-performance aircraft. They designed the Silarius 490. This is an aircraft the team designed to land and take off from any relatively flat surface, including water. The use of an Air Cushioning Landing system in the Design also garnered the team a \$3000 award for the Best Use of Air Force-Developed Technology award.

The team accepted the award from NASA and the FAA, the competition sponsors of this prestigious award, at the Experimental Aircraft Association's Air Venture 2000 in Oshkosh, WI on July 29.



(Pictured left to right) Cecilia Hunzler, FAA regional Administrator for the Great Lakes Region, Professor William Crossley, Tyson Struzenberg, Michael Koenigs, Chris Peters, (team leader) Jeffrey Rodrian, Dennis Carter, senior Aerospace Engineer, Air Force Research Laboratory, and Hank Jarrett, Deputy Manager, NASA General Aviation Program Office. Other team members not pictured, Keith Hout, Craig Malmoff, and Brian Pfeiffer.



(Left to right) Jarret Matthews, Ben Partridge, Steve Hanna, Sherri Spreadbury, Guy Gardner, Adam Irvine, Kris Massie, Brian Fischer.

## Contact Us!

As an alumna or alumnus of our School, you are our best ambassador. If you know of someone interested in earning an undergraduate or graduate degree in aeronautical and astronautical engineering, we want to know!

Please encourage them to contact us at:  
Counseling Office, School of Aeronautics & Astronautics  
Purdue University, 1282 Grissom Hall  
West Lafayette, IN 47907-1282 (765) 494-5152.

### Competition Winner


## The Society of Women Engineers won the 18th annual Rube Goldberg Machine Contest in February 2000.

In 37 steps, the team's machine "Traveling Through Time" placed the 10 items its members thought were the most significant into a Rubbermaid spaghetti Keeper. Some of the items that they chose were a computer, a McDonald's item, a helicopter and a jeep with a 4-wheel drive.

The Society of Women Engineers was the only team out of four competing that did not use human intervention while its machine was in motion.

Along with the first place trophy, the team won a full sized refrigerator supplied by the contests sponsor, General Electric.

The team worked for about 20 hours per week from the beginning of the semester. All members of the team are in the schools of Engineering and the team members were: Leigh Ann Heider -senior, Debbie Klein -junior, Todd Heider-


senior, John Dankanich-senior, Patrick Dempsey-senior, Lisa DeNicola-freshman, Adam Irvine-senior, Santosh Kuruvilla-senior, Kimberley Overhage-freshman, and Wendy Wyatt- sophomore. 




## Enrollment

The enrollment and the numbers of graduates continue to rise. During the 1999-2000 academic year, 43 students earned their Bachelor of Science degree, 35 earned their Master of Science degree, and 9 were awarded their Doctor of Philosophy degrees.

The school had 238 undergraduate students (excluding freshmen) beginning in the Fall of 1999, representing a 25% increase over 1998. Graduate enrollment was 136, with 64 students in the M.S. program and 72 in the Ph.D. program

Purdue University remains an attractive destination for international students. During the academic year 1999-2000, saw Purdue lead all public research institutions in total number of international students enrolled. This trend is evident at AAE, also, with international students comprising 13% of undergraduates, 52% of Masters level, and 69% of Ph.D. level students. 

## Society of Women Engineers Award for Scholastic Achievement

Congratulations to Shannon Fitzpatrick awarded in February 1999 with a Society of Women Engineer's Award for Scholastic Achievement. The other honorees include Lisa Brilliant, Kristen Gates, Nicole Key, Casey Kirchner and Theresa Debban. 

Shannon Fitzpatrick presented with her award by Prof. Tom Farris.





## Class Notes Information Update Form

Your friends and former classmates want to know what is happening in your life! Please jot down personal news that you want to appear in the next edition of **AeroGRAM** and forward it to: School of Aeronautics and Astronautics, 1282 Grissom Hall, West Lafayette, IN 47907-1282, or send us e-mail at:

<http://www.aae-alumni@ecn.purdue.edu>.

---



---



---



---

## Thanks for Remembering!

Last year the School received more than \$27,000 in matching gift funds—because you remembered to turn in your matching gift form! On an accumulative basis, your matching gifts can determine whether the School purchases additional computer hardware and software, provides further support to student organizations, or purchases equipment for our faculty and their research. Thank you so much for turning in your forms!

**aer•o•gram**  
(â€™ə gram/),  
n. an airmail letter.

A newsletter published twice a year for the alumni and friends of the School of Aeronautics & Astronautics. Edited by **Ann Broughton**.

Please send inquiries to  
**Tim Bobillo** at:

School of Aeronautics & Astronautics  
Purdue University  
1282 Grissom Hall  
West Lafayette, Indiana  
47907-1282

**Phone:** (765) 494-9124

**Fax:** (765) 494-0307

**E-mail:** [aae-alumni@ecn.purdue.edu](mailto:aae-alumni@ecn.purdue.edu)

**Web Page:**  
<http://aae.www.ecn.purdue.edu>

Unless otherwise noted, articles in **AeroGRAM** may be reprinted without permission. However, appropriate credit would be appreciated.

EA/EOU



Printed on Recycled Paper

School of Aeronautics & Astronautics • Purdue University  
1282 Grissom Hall • West Lafayette, IN 47907-1282

**AeroGRAM**  
Purdue University



Purdue University

PAID

U.S. Postage

Nonprofit Organization