Antoine de Saint-Exupéry said, “A rock pile ceases to be a rock pile the moment a single man contemplates it, bearing within him the image of a cathedral.” On our cover, civil engineering student Carolina Aguilar contemplates a future of structural engineering in a single lump of concrete.

It is such vision that has built cathedrals, bridges, space shuttles and micro-medical devices.

While engineers use their vision and imagination to create the products, systems and technologies of the future, engineering educators likewise imagine the future in order to prepare students for new challenges and changing roles in society. This report not only highlights some of the achievements of the College of Engineering faculty, students and programs in 2005-06, but also notes the creative vision that will steer the college into that future.
“Vision without action is a dream. Action without vision is simply passing the time. Action with Vision is making a positive difference.”

—Joel Barker
Message from the Dean

I feel honored to join Cal Poly at this time in history. Already a premiere engineering institution, the College of Engineering is poised to step to the next level of prominence because of our winning combination of new facilities and new programs, outstanding and devoted faculty, exceptional students, loyal alumni, strong industry partnerships and a polytechnic philosophy based on “learn by doing.”

To truly lead the United States into a new engineering Renaissance, however, we must reshape engineering education to meet the needs of a new social landscape and to address the new global challenges.

“...we must reshape engineering education to meet the needs of a new social landscape and to address the new global challenges.”

The National Academy of Engineering recently noted that engineers need “new attributes to perform well in a world driven by rapid technological advancements, national security needs, aging infrastructure, environmental challenges, and the creation of new disciplines at the interfaces between engineering and science.”

I believe Cal Poly has the strengths be a leader in this revolutionary trend by instilling our teaching and research with an interdisciplinary perspective, training our students in entrepreneurial skills, enhancing opportunities for faculty and student applied research, and emphasizing a greater understanding of the impact of technology on society. We also need to generate more diversity in the engineering corps.

I have no doubt that our fine students will respond marvelously to the call for engineers with a social conscience and environmental awareness. To prove the point, let me recite just a few outstanding student accomplishments this year:
• Engineering students founded Cal Poly’s Engineers Without Borders and installed a drinking water treatment system for a hill tribe village in Thailand.

• EE senior Robert Johnson helped lead Cal Poly’s Solar Decathlon team to a third place national victory, and his experience has led him to explore ways to commercialize solar living units.

• Another senior, Alex Tsuji, was sponsored by the EPA to develop a recyclability index for automobiles, which will help consumers make environmentally responsible decisions.

• Andrea Ramirez, a graduating senior, also made an enormous contribution to campus sustainability goals by instituting a program to make Open House a “zero waste” event.

These and scores of other examples illustrate how Cal Poly engineers are responding with energy, imagination and commitment to the compelling problems of our era. Our job is to enable this next generation of engineers who, as the Academy points out, must not only be “technically proficient, but also ethically grounded global citizens who can become leaders in business and public service.” I am excited and optimistic about undertaking this calling with the help of alumni, friends, and industry partners.

Dr. Mohammad Noori, Dean, College of Engineering

Engineers...are not mere technicians and should not approve or lend their names to any project that does not promise to be beneficent to man and the advancement of civilization.

—John Fowler
Message from Paul Bonderson, Chair Dean’s Advisory Council

The Bonderson Project Center began with a vision, and during this past year I’ve had the pleasure of watching the foundation laid and walls rise. Likewise, the Dean’s Advisory Council (DAC) has spent this year formulating a vision and strategic plan that will lay the foundation for a new level of excellence.

The primary impetus for this vision comes from the new dean of the College of Engineering, Dr. Mohammad Noori. His energy, enthusiasm and understanding of the challenges facing the college and engineering education today have impelled the DAC to make changes and undertake new initiatives.

“We need to launch a new phase of fundraising with the long-term vision of inaugurating an endowed College of Engineering”

This year, we discussed how we can enhance and expand the composition of the DAC, improve partnerships for more collaborative projects with industry, and identify core thrust areas within the college to spearhead research and development.

In order to achieve these goals, we determined that we needed to establish a new committee structure to facilitate direct involvement and more effective interaction of the Council with college and university constituents. These new committees will address Strategic Planning, Alumni Relations and Advancement, Academic Program Review and Development, Industry/University Partnership, and Public Relations and Ambassadorship. The committees will meet regularly to develop plans, goals, objectives, measures and metrics.
Meanwhile, we re-focused on college funding needs. We believe it’s time to launch a new phase of fundraising, with the long-term vision of inaugurating an endowed College of Engineering. Veteran DAC member Kathleen Holmgren graciously agreed to step in as chair of the CENG Campaign Committee, replacing the indefatigable Paul Wright, who headed the college Centennial Campaign. Personally and on behalf of the Council, I’d like to thank Paul for his outstanding leadership, service, and dedication. The College of Engineering would not be in such a propitious state without him.

As we turn our sights to immediate goals and a future vision for the college, I and my DAC colleagues feel excited about our new roles and energized by new plans and ideas for action. We look forward to working with CENG faculty and staff, and reaching out to alumni, friends and industry partners as we forge ahead in building this fine institution.

—Unknown Author—

Paul R. Bonderson, Jr.,
Chair
President, Lone Oak Ventures LLP

Vision: The first step toward creating an improved future is developing the ability to envision it. -

—Unknown Author—
2005-06 Highlights

• The College of Engineering (CENG) was ranked No. 1 in the nation for public schools whose highest degree is a bachelor’s or master’s by U.S. News & World Report. Cal Poly’s computer, electrical, industrial/manufacturing, and mechanical programs were each ranked as the top at a public university. The civil engineering program ranked No. 2.

U.S. News also recognized Cal Poly as the best public-master’s university in the West for the 13th year in a row and recognized the university as a leader in internships/co-ops.

• Dr. Mohammad Noori succeeded Peter Y. Lee as dean of the college. The lobby of the Advanced Technology Laboratories Building was named the “Peter Y. Lee Hall” in recognition of Dr. Lee’s 18 years of service.

• In Fall 2005, CENG enrolled 4,593 undergraduates and 242 graduate students, admitting 45.6% of the 5,310 new student applicants. The average SAT for freshmen was 1,266; the average high school GPA for the class was 3.83.

• In 2005-06, alumni, friends and industry partners contributed $7 million, which represents almost 30% of the total amount donated to the university as a whole. CENG’s gifts included $185,000 in equipment and technology; $1.6 million in cash gifts and pledges; endowments received $4.6 million; and $500,000 went to capital.

• Engineering III was occupied by the Aerospace, Materials, and Industrial & Manufacturing Engineering Departments and dedicated as the “Grant M. Brown Engineering Building” in honor of the generous donations of the Brown Family Foundation.

• Cal Poly became the first campus in the CSU to offer a degree in Biomedical Engineering and an AERO master’s degree specialization in Space Systems.

I take the vision which comes from dreams and apply the magic of science and mathematics, adding the heritage of my profession and my knowledge of nature’s materials to create a design...

...I am an Engineer, I serve mankind by making dreams come true.

—Anonymous
Student Team Achievements –

Student teams from Cal Poly, San Luis Obispo College of Engineering shined during regional and national competitions throughout 2005–2006. The following two pages show a handful of our Student Teams’ achievements.

• Students Armen Toorian, Lori Brooks, and Derek Huerta traveled to Kazakhstan to help assemble the largest ever launch of picosatellites. Technical problems brought down the Russian-made rocket, but the real-world lessons learned will serve next year’s CubeSat team. The group is already working on a satellite that is due to launch in December 2006.

• Cal Poly AERO undergraduates swept the American Institute of Aeronautics & Astronautics (AIAA) design competition, taking first, second and third, and also took first and second in the Society of Allied Weight Engineers (SAWE) international student paper competition.

• Cal Poly’s Society of Environmental Engineers (SENVE) was named “Best Chapter in the Nation for Medium Institutions” for the 6th year in a row and placed 2nd at the 2006 “Water Treatment from Your Kitchen ... and Beyond” competition.

• Cal Poly’s ASME (American Society of Mechanical Engineers) won the Ingersoll Rand Competition for the West Coast Region for the tenth year in a row.

The Society of Hispanic Professional Engineers (SHPE) won a fourth straight national championship with a “Sound-Activated Baby Mobile” project and also took 3rd and 4th place in the design contest sponsored by the SHPE National Technical Career Conference.

Cal Poly took third in the national Solar Decathlon competition in Washington, D.C.

The solar power home is shown at right.
For the fourth straight year, Cal Poly’s Society of Women Engineers (SWE) was named the nation’s best “large” student section. The group also took 1st for Team Tech, Multicultural, Career Guidance Scrib, and Membership.

Cal Poly’s Society of Civil Engineers took second in the National Concrete Canoe Competition.

The Human Powered Vehicle placed 1st in design and 3rd in sprints at the HPV Western Challenge.

Engineers Without Borders successfully completed its first international project by installing a drinking water treatment system for Mae Nam Khun village in Thailand.

Cal Poly took third in the international Cessna/ONR Design/Build/Fly Competition Flyoff held April 21-23, 2006 in Wichita, KS.
Aeroplanes are not designed by science, but by art in spite of some pretence and humbug to the contrary. I do not mean to suggest that engineering can do without science, on the contrary, it stands on scientific foundations, but there is a big gap between scientific research and the engineering product which has to be bridged by the art of the engineer.

—British Engineer to the Royal Aeronautical Society, 1922

Aero

Aerospace Engineering

- Upon approval by the Academic Senate, Cal Poly became the only CSU campus to offer an aerospace master’s degree specialization in Space Systems.

- Students Armen Toorian, Lori Brooks, and Derek Huerta traveled to Kazakhstan to help assemble the largest ever launch of picosatellites. Technical problems brought down the Russian-made rocket, but the real-world lessons learned will serve next year’s CubeSat team. The group is already working on a satellite that is due to launch in December 2006.

- The department moved into the Brown Engineering Building.

- The Boeing Company, Northrop Grumman, Lockheed Martin and Raytheon provided generous support for the CubeSat Project and other department programs and activities.

- Edwards Air Force Base Flight Test Center provided a $35,000 year-long sponsorship of the AERO Aircraft Design Lab, which has produced dozens of award-winning design teams. Lab director Dave Hall led a dedication ceremony that included past faculty, NASA representatives, students, and Air Force personnel.

- At an on-campus “Tech Day” hosted by longtime industry partner Lockheed Martin, the company announced a gift of four annual $2500 scholarships for new aerospace engineering freshmen selected on the basis of academic merit.

- Students and faculty from more than 20 other universities from around the world came to campus for the CubeSat Developers’ Workshop.

- For the sixth time in seven years, Cal Poly undergraduate designers won the AIAA design competition; in fact, teams from Dave Hall’s senior design sequence class swept first, second and third—the first time a school has swept the awards in 23 years.

- AERO’s Team Defiant took first place in the student paper competition at the 2006 Society of Allied Weight Engineers (SAWE) International Conference, and Team Avari took second place.

- Cal Poly took third in the international Cessna/ONR Design/Build/Fly Competition Flyoff held April 21-23, 2006 in Wichita, KS.

- NASA recognized AERO’s C-17 Noise Mitigation Flight Research Team with a prestigious Group Achievement Award and two Peer Awards.

- Burt Rutan (AERO ’65) received the Cal Poly President’s Medal of Excellence in recognition of his extraordinary contributions to aerospace and aviation design.

- John Parker (AERO ’54) set a new world Sport Class speed record of 383 mph.

- Department technician Dan Powell received the 2006 Outstanding Staff Award from the College of Engineering.

- Cal Poly took third in the international Cessna/ONR Design/Build/Fly Competition Flyoff held April 21-23, 2006 in Wichita, KS.
To make contributions of this kind the engineer requires the imagination to visualize the needs of society and to appreciate what is possible as well as the technological and broad social-age understanding to bring his vision to reality. — Sir Eric Ashby (1958)

BMED/GENE

Biomedical & General Engineering

- With approval by the Chancellor, Cal Poly became the first campus in the CSU to offer a Biomedical Engineering degree. The program grew out of an existing concentration in the General Engineering Degree Program, which has been providing talent to the biomedical industry, medical schools and Ph.D. programs for over a decade. Its new status as a degree-granting program reflects tremendous student demand, industry needs as well as societal imperatives. Specialty areas include biomedical design, biomaterials analysis and development, biosensors and bioinstrumentation, biomechanics, systems physiology, clinical engineering and rehabilitation engineering.

- Over 1,100 applications were submitted to the Biomedical and General Engineering Department. Over 175 new students will attend next year. The Department is engaged in faculty recruitment efforts to meet high student demand and burgeoning enrollments in the new Biomedical Engineering program. The program will add five new faculty in the next two years.

- The Biomedical Engineering Consortium, a departmental “clearing house” for student projects, has been a resounding success. Industry has sponsored over 20 joint student projects, shared with students from five engineering departments.

- Students committed Department-Based Academic Fees to support new faculty positions in BMED/GENE.

- The Biomedical Engineering Society hosted speakers from St. Jude Medical, the National Academy of Engineering, Patient Patents, Guidant, Brooke Army Medical Center, USC, Edwards, Stryker, the University of Arizona, U.C. Santa Barbara, Gore Medical, Surgical Associates, Patient Patents, and Abbott Vascular Devices.

- St. Jude Medical provided an additional $200,000 towards its pledge to establish an endowment in support of BMED bringing the total received to $400,000.

- Thirty-nine students are currently enrolled in the distance-learning, MS-granting program, which allows on-campus students to learn “side-by-side” with career professionals. The program has produced four graduates in the last two years.

- Biomed scholar Chris Gocong won the Buck Buchanan Award as the best defensive player in Division 1-AA Football. He was drafted as the tenth player selected in the third round (70th overall pick) by the Philadelphia Eagles of the NFL. He is the only defensive end in the league who can break a runner’s leg, then set the fracture before the subsequent play ensues!

- Engineering master’s degree student John Becker was named as one of the college’s two top Outstanding Master’s Degree Candidates for Academic Excellence.
Now in its 13th year, Roborodentia drew approximately 2,000

Professor Yarrow Nelson received the Distinguished Teaching Award, the university’s highest honor.

Associate Professor Damian Kachlakev received the Northrop Grumman Excellence in Research & Development Award.

Professor Rakesh Goel was elected Fellow of the American Society of Civil Engineers.

Numerous faculty research projects by Drs. Goel, Kachlakev, Moss and Rahim received funding. In addition, Assistant Professor Dan Jansen received a $190,570 NSF grant for the purchase of a materials testing machine, which is the centerpiece of a new, 2400-square-foot Pavement and Advanced Materials Laboratory. Jansen teamed with colleagues in civil, mechanical, and aerospace engineering on the grant.

Cal Poly’s Society of Environmental Engineers (SENV) was named “Best Chapter in the Nation for Medium Institutions” for the 6th year in a row. SENVE placed 2nd at the 2006 “Water Treatment from Your Kitchen...and Beyond” competition sponsored by the American Society of Civil Engineers.

Cal Poly’s Society of Civil Engineers took first overall at the ASCE Pacific Southwest Regional Student Competition. Katana, Cal Poly’s 250-pound, 21.25-foot concrete canoe subsequently placed second in the nationals.

Engineers Without Borders successfully complete its first international project by installing a drinking water treatment system for Mae Nam Khun village in Thailand.

ENVE 4 + 1 student Alex Tsuji received a $10,000 grant from the EPA to develop a recyclability index for automobiles.

Eileen Mick and Andrea Ramirez were named Outstanding Women in Engineering & Technology by the Society of Women Engineers. Mick is a co-founder of Engineers Without Borders; Ramirez initiated “Zero Waste Cal Poly.”

Besty Sale was named CENG’s Outstanding Graduating Senior for Contributions to the College, and Eileen Mick was the Outstanding Graduate Student for Service.

Francisco Arias, Alicia Barratta, and Russell Fenton were chosen as Poly Reps to promote Cal Poly to prospective students, alumni and friends of the university.

Judy Ledford (ENVE ’97) was named an Outstanding Recent Alumna by the college, and Eric Nielsen (CE ’83) received CENG’s Professional Achievement Award.

U.S. News & World Report ranked Cal Poly’s computer program as the best in the nation for public, largely undergraduate universities.

The median starting salaries of program graduates remained high at $58,000, with many graduating seniors getting multiple interviews and employment offers.

CPE quadrupled the number of female applicants and had highest retention rate of student majors in the college and one of the lowest dropout rates.

Lyne Slivovsky (EE, CPE) was named the Hood Endowed Professor. Among other activities, Slivovsky has introduced service learning into the new CPE capstone sequence, whereby students reflect on engineering design, ethics and societal implications of engineering and teamwork.

Assistant Professor John Seng (CSC/CPE) was named the 2006 Outstanding Club Advisor by the Engineering Student Council.

To replicate the work graduates will do in industry, the program incorporated RFID projects into the capstone sequence—student teams write the requirements and specifications for computers they build for actual use in the RFID lab.

Now in its 13th year, Roborodentia drew approximately 2,000 visitors at Open House. Fourteen teams competed in the contest organized by Cal Poly’s IEEE and sponsored by Teradyne Corp. First place went to Cal Poly Team DataB comprised of Blair Baker (CPE), Chris Pasillas (Music) and alumnus Mark Walz (EL ’80).

CPE students recognized outstanding faculty for 2005-06, including Outstanding Lab Instructor, Dr. Bryan Mealy, Best Advisor, also Dr. Mealy, and Outstanding Instructor, Dr. John Seng. The program presented Student Service Recognition awards to Naris Vipatapat, Joe Bass, Arun Srinivasan, Brian Brasseur, Thee Sanpitakseree, Blair Baker, Avinda Bandaranayake, Drew Haney, Jonathan Sou, Derek Lockhart and Jennifer Mankin.

Roger Tiu (CPE/EE) was the college’s topmost B.S./M.S. student for academic excellence.

Jennifer Overgaag was named the college-wide Outstanding Graduating Senior for Service to the Community and an Outstanding Woman in Engineering & Technology by Cal Poly’s Society of Women Engineers.
CSC/SE – Computer Science & Software Engineering

- In August 2005, Dr. Mei-Ling Liu was named interim CSC chair.
- Dr. John Clements joined the department as an assistant professor.
- The department dedicated the Bonderson Computer Science Laboratories, newly renovated thanks to a $1 million gift from Cal Poly alumnus Paul Bonderson.
- Alumnus Gary Bloom (CSC ’82) made a gift of $100,000 for student scholarships and grants to encourage industry-faculty collaboration.
- New course offerings included Advanced Topics in Computer Graphics and Autonomous Mobile Robotics.
- CSC students provided Student Academic Fees to support course offerings, to increase lab availability, to enhance lab facilities, and to make five laptop computers available to students.
- Cal Poly placed third in the ACM International Collegiate Programming Contest for the Southern California Region. Sixty-six teams from 25 universities participated.
- Assistant Professor John Seng (CSC/CPE) was named the 2006 Outstanding Club Advisor by the Engineering Student Council.
- Mei-Ling Liu was offered a Fulbright Award to lecture and research in Macedonia in Winter and Spring 2007.
- New faculty member David Janzen placed in the top three of the ACM Student Research Competition Grand Finals.
- The student ACM chapter received an ACM Chapter Excellence Award for Outstanding Website.
- CSC students earned distinctions: Freshman Michael McThrow received a Undergraduate Research Fellowship from the National Science Foundation. Deepashree Krishnamurthy was one of the college’s two topmost master’s degree candidates for academic excellence. Senior Christopher Brigham was admitted to Stanford’s master’s degree program, while James Skorupski and Mark Gabel were among students from the 4+1 program admitted to U.C. doctoral programs.
- Stephanie Ludi (CSC ’94, M.S. ’96) was named an Outstanding Recent Alum by the college; Jim Berney (CSC ‘94) received the College of Engineering Professional Achievement Award.
- In July 2006, Dr. Ignatios Vakalis accepted an appointment for the Department Chair position, to start in Fall 2006.

EE – Electrical Engineering

- Drs. Dennis Derickson, Wayne Plilkinson and Fei Wang joined the department.
- Assistant Professor Lynne Slivovsky was named the Hood Endowed Professor.
- Lecturer Sylvia Liddicoat and Shirley Magnusson from the College of Education received a $150,000 gift from S.D. Bechtel, Jr. for a project to engage elementary school students and their teachers in science, technology, engineering and mathematics (STEM).
- Lawrence Livermore National Laboratory enhanced the teaching and research capabilities of the Photonics Lab with equipment valued at $40,000, including a laser diode, isolators, analog TX modules, and more. The gift was facilitated by Bruce Henderer (EE ’95), an engineer at Lawrence Livermore.
- EE’s graduate program has developed into one of the largest in the university, with students enrolled in both the master’s degree program and the department’s 4+1 B.S./M.S. honors program.
- To enhance instruction, the department offered more studio courses.
- The department received the Partners in Innovation Award from Hitachi Global Storage Technologies for a project by Professor Al Liddicoat and master’s degree students Chris Ackles and John Carlin.
- The website for Cal Poly’s IEEE (Institute of Electrical and Electronics Engineers) won first place against student chapters in 11 western states.
- Roger Tiu (CPE/EE) was the college’s topmost B.S./M.S. student for academic excellence, while Joe Vaccaro was named the college-wide Outstanding Graduating Senior for Contributions to the University.
- Student Teresa Su was named an Outstanding Woman in Engineering & Technology by the Society of Women Engineers and Hewlett-Packard.
- Senior Robert Johnson served as one of three project leaders for Cal Poly’s Solar Decathlon team, which placed third in the nation.
- Alumnus Ron Smith (EE ’83) received the Black Engineer of the Year Award. Smith is vice president for Northrop Grumman’s Six Sigma sector.
- Carson Chen (EE ’73) received the College of Engineering Professional Achievement Award. Chen helped found Innovation Quest, a philanthropic corporation that supports Cal Poly faculty and student projects.
Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity.

—George S. Patton

IME –
Industrial and Manufacturing Engineering

- U.S. News & World Report ranked IME the best in the nation for public, largely undergraduate universities.

- More than 300, including alumni and their families, students, faculty, employers and friends celebrated IME’s 50th Anniversary Golden Jubilee that included lab demos, nostalgic displays, and a banquet co-hosted by William H. Swanson (IE ’73), Raytheon chairman and CEO, and Kathleen Holmgren (IE ’80), former senior v.p. for Sun Microsystems.

- Millard & Florence Fotter and George & Joyce Hoffman were recognized as “IME Founders” at the Golden Jubilee, while Paul & Ruth Scheffer, Col. Jim & Kathy Golden, and Don & Jane Morgan were named “IME Early Leaders.”

- The department moved into new quarters in the Brown Engineering Building and opened support areas and labs for Material Removal, Welding & Foundry, and Advanced Computer Numerical Control (CNC). The facilities host HAAS machining centers, laser and lathe systems, new manual mills with CNC capability, and new multipurpose welding stations. The new facilities allow learning in a safer, cleaner and more computer-active manner.

- Dr. Roya Javadpour was named one of San Luis Obispo’s “Top 20 Under 40” by The Tribune newspaper in recognition of her PolyHouse project. Javadpour and her students were also featured in Industrial Engineer, an international journal.

- The department integrated project management, supply chain management, and globalization across the IE and MfgE curricula in order to prepare the “engineer of the future.” Additionally, many IME classes provided “real world” engineering experiences through collaboration with industry.

- IME faculty contributed to the field. For example, Jose Macedo and Don White became certified as instructors for the MIT Lean Aerospace Initiative. Macedo also taught a seminar sponsored by Boeing and IIE on the fundamentals of measurement systems. Dan Waldorf edited an issue of the SME Journal of Manufacturing Systems and provided reliability and maintainability training at Parker Hannifin. By increasing funding and projects for Cal Poly’s GAIT Lab, Tali Freed and Larry Rinzel expanded the university’s involvement with Radio Frequency Identification (RFID) technology.

- Professors Rod Hoadley and Kurt Colvin initiated Racks With Plaques to encourage bicycle commuting. The program won a merit award from the American Planning Association for its originality, quality and effectiveness.

- Department technician Ladd Caine received the 2006 Outstanding Staff Award from the College of Engineering.

- Erica Janoff was named a Poly Rep to promote the university.

- Olivia Shen Green (IE ’98) was named an Outstanding Recent Alum, while Susan Mooney Johnson (IE ’78) received the college’s Professional Achievement Award.
MATE

Materials Engineering

• The department received a $1 million grant from the National Science Foundation to redesign the MATE curriculum in order to attract more women and minorities while preparing all students to solve increasingly complex global problems.

• Because of its ongoing research in engineering education, MATE was selected as a Research Community Affiliate in the Center for the Advancement of Scholarship on Engineering Education (CASEE) of the National Academy of Engineering.

• The department occupied its new home in the Brown Engineering Building and unveiled a “Class 1000” Microfabrication Clean Room, housing a full suite of tools to make micro-electro/mechanical devices and integrated circuits.

• New courses and labs were offered. “Materials Selection for the Life Cycle” is designed to provide the analytical tools to select materials for optimum sustainable product performance. “Nanotechnology, Human Biology, Ethics and Society” is a multidisciplinary, systems-focused course based on the science, engineering and implications of four nanotechnologies that span the biological levels. Two new sophomore-level laboratories emphasized building materials engineering laboratory skills. The department also focused on integrating the use of computer-data acquisitions in measurements, use of statistics for process control and industry practices for manufacturing.

• Professor Linda Vanasupa initiated a new research group which explores ways to increase the performance and lengthen the time to failure for hydrogen fuel cells.

• MATE selected its freshman class from the largest applicant pool the department has had in 15 years. It was four-and-a-half times the size of the previous year. The master’s program also increased to 15% of the total department student body, a three-year goal that was met in one year.

• MATE’s NSF grant enabled the department to hire lecturer Victor Granados. He is an expert in the high technology industry, having served as a senior manufacturing engineer in the field of superconductors technology. Part of his position involves working with the mathematics teacher at Nipomo High School to bolster student math skills.

• The department co-sponsored several speakers on Sustainability as part of the university’s January theme “Sustainability: Resolve to Change Your World.” Speakers included Alex Sloan of Blackwolf Partners, a clean-tech venture capital firm and Dr. J. Peter Myers, co-author of “Our Stolen Future.”

Every age needs men who will redeem the time by living with a vision of things that are to be.
—Adlai Stevenson
Mechanical Engineering Highlights

- Dr. Tom Mackin was appointed department chair. Other new faculty included Bently Endowed Professor Julia Wu and Assistant Professor Lou Rosenberg.

- The ME Student Fee Allocation Committee (MESFAC) provided funds for additional courses, the extensive renovation of the Fluids and Engines Labs, and funding for a seminar series.

- The college dedicated the Grant M. Brown Engineering Building in recognition of 1960 air conditioning and refrigeration alumnus, Grant Brown and the generous donations of the Brown Family foundation.

- Associate Professor William R. Murray received the Northrop Grumman Excellence in Teaching Award and was named the Lockheed Martin Endowed Professor.

- Associate Professor Andrew Davol received the Raytheon Excellence in Teaching and Applied Research Award.

- Associate Professor Chris Pascual was the first recipient of the Wingate Foundation Award for Excellence in Heating, Ventilation and Air Conditioning.

- Professor Joe Mello received the Distinguished Faculty Advising Award from SAE International for his mentorship of Cal Poly’s Society of Automotive Engineers.

- Wolfgram Engelberger and Christoph Maurer from Munich University of Applied Sciences joined the department as visiting professors, while Dr. Frank Owen from Cal Poly assumed their posts in Munich.

- The Heating, Ventilating, Air Conditioning and Refrigerating (HVAC&R) program continued to build with the help of alumnus John Wingate, who established a program to provide scholarships and industry internships.

- The Human Powered Vehicle (HPV) placed 1st in design and 3rd in sprints at the American Society of Mechanical Engineers HPV Western Challenge hosted this year by Cal Poly.

- Cal Poly’s ASME (American Society of Mechanical Engineers) won the Ingersoll Rand Competition for the West Coast Region for the tenth year in a row. The contest recognizes the most active student section.

- ME students and ME faculty advisor Jesse Maddren were part of the first Cal Poly Solar Decathlon Team, which placed third in the nation.

- Brent Sindorf received the Outstanding Thesis Award from the university for his master’s thesis on “Force Feedback Control for Visually Impaired Wheelchair Users.”

- Seniors Daniel Kawano and Lianne Williams tied as the college-wide Outstanding Graduating Seniors for Academic Excellence.

- Michael Sanders (ME ’96) was named a CENG Outstanding Recent Alum and 1985 graduate Robert Addis received the 2006 College of Engineering Professional Achievement Award.

- Competing for the first time in more than a decade, the Supermileage Team placed sixth overall at the 27th Annual SAE Supermileage competition and sixth in Fuel Economy.

For I dipped into the future, far as human eye could see, Saw the vision of the world, and all the wonder that would be.  
—Alfred, Lord Tennyson
**MEP – Multicultural Engineering Program**

**Highlights**

- MEP served over 300 Cal Poly students and 400 pre-college students from the Central Coast area.
- For the fourth year in a row, Cal Poly’s Society of Hispanic Professional Engineers (SHPE) took 1st at the annual Design Contest hosted at the annual SHPE National Technical and Career Conference. Cal Poly SHPE teams also won 3rd and 4th place honors.
- With an 89% retention rate for first-year students, MEP hit a three-year average high comparable to the retention rate for the college as a whole.
- Cal Poly’s MEP program received $80,000 from the U.C. Office of the President to offer the pre-college MESA Schools Program to low-income students.
- Cal Poly hosted the Regional MESA Day Preliminaries, which brought more than 150 students from junior and senior high schools to campus to participate in hands-on engineering activities.
- The program partnered with Lockheed Martin on outreach at Santa Maria High School that engaged students in MESA activities and hands-on projects such as building rockets and trebuchets.
- Corporate sponsored scholarships totaling more than $75,000 were awarded to approximately 30 students at the MEP Corporate Social and Academic Recognition Banquet. The event was made possible through generous contributions to MEP from ChevronTexaco, Frito-Lay, Hewlett-Packard, Lockheed Martin, Northrop Grumman, Raytheon, and Intuit.
- Along with other regional universities, Cal Poly participated in a two-day MEP Leadership Workshop hosted by Northrop Grumman, Lockheed Martin, Disney Imagineering, and Frito-Lay. Attendees included executive officers of campus professional societies, including SHPE, the Society of Black Engineers and Scientists (SBES), the American Indian Society of Engineers & Scientists (AISES), and the Society of Women Engineers (SWE), as well as corporate representatives.
- Over 50 SHPE members participated in the NTCC conference in Orlando; SBES sent twelve members to the National Society of Black Engineers (NSBE) conference in Pittsburgh, and three AISES officers went to the national meeting in Charlotte, NC.
- SHPE’s Advancing Careers in Engineering subcommittee provided math and science tutoring in Spanish to youngsters at a local elementary and middle school.
- Alumnus Ron Smith (EE ’83) received the Black Engineer of the Year Award. Smith is vice president for Northrop Grumman’s Six Sigma sector.

**WEP – Women’s Engineering Program**

**Highlights**

- For four years running, Cal Poly Society of Women Engineers (SWE) was named the nation’s best “large” student section. Cal Poly also won the Multicultural Award, Career Guidance Scribe Award, and Membership Award.
- SWE Team Tech also took first in the nation with a project to design a maintenance vehicle for Disney World’s “Expedition Everest” ride.
- With 484 members, Cal Poly SWE was the largest student section in the nation.
- SWE awarded $42,000 in scholarships at Evening With Industry (EWI), which included a keynote speech by Dr. Patricia Galloway, an appointee to the National Science Board.
- Forty-five Cal Poly members volunteered at the SWE National Conference in Anaheim, where Peter Lee, dean emeritus, was presented the Rodney D. Chipp Memorial Award in recognition of his efforts to create opportunities for women in engineering.
- SWE collaborated with the University Center for Excellence in Science and Mathematics Education to provide middle school teachers with engineering curriculum.
- Andrea Ramirez was the first Director of Sustainability. She launched the Cal Poly “Zero Waste” project. In addition, SWE organized a sustainability career fair and co-sponsored a talk by a principal in a venture capital firm specializing in the clean tech sector.
- SWE created “Passport to Engineering,” a new outreach event at Open House, which involved 11 engineering clubs. SWE boosted participation in the event by advertising at local schools in English and Spanish.
- SWE reached out to newly admitted students through an expanded “Shadow an Engineering Student” program. Over 30 prospective female freshmen got a first-hand experience at Cal Poly by spending a night in the dorms with a SWE “roommate,” attending classes, and visiting downtown San Luis Obispo.
- Education efforts by SWE included Building An Engineer with 200 student and parent participants, 4th Grade Outreach during National Engineers Week, and Girl Scout Engineering Day in which four troops earned “Making it Matter” badges.
- With the American Indian Society of Engineers & Scientists (AISES), the Society of Black Engineers & Scientists (SBES), and the Society of Hispanic Professional Engineers (SHPE), SWE attended a Minority Leadership Training Seminar hosted by Lockheed Martin, Northrop Grumman, Disney Imagineering and Frito-Lay.
- SWE emphasized diversity in engineering by connecting with multicultural engineering clubs on campus for social events, a shared Resumé Book, and integration of press and event advertising.
The sound of heavy-lift cranes and pneumatic wrenches was replaced by power saws and paint sprayers as construction of the Bonderson Student Projects Center (above) and the three-story Engineering IV building (below) moved into finishing phases during the summer. The 19,000-square-foot Bonderson Student Project Center was on track to open for students in late September, needing only final electrical and plumbing work, final painting and completion of the landscaping. The building features group work and assembly areas, a robotics lab, a computer modeling and systems lab and additional support workshops for metal fabrication, wood and chemistry. With an anticipated delivery date of February 2007, Engineering IV has 104,000 square feet of offices, labs and classrooms for the ME, IME, CE-ENVE and AERO departments.
A Message from Kathleen Holmgren, Chair

Maintain the Momentum

Like my fellow alumni and Dean’s Advisory Council members, I am delighted by the exciting changes occurring at the College of Engineering: new Dean, new buildings, new programs, and new ideas for enhancing our hallmark hands-on education.

While we face many challenges—secure and adequate funding not the least of them—I believe the college stands at an opportune moment. Not only can we capitalize on our reputation as one of the nation’s leading engineering schools, but we should also seize the chance to reshape engineering education to better meet the needs of industry and society.

So, when Dean Noori and Dean’s Advisory Council Chair Paul Bonderson asked if I would consider chairing efforts to step up the college advancement program, I felt that the timing was right. Although I’ve been a member of the DAC since 1995, I’m looking forward to increasing my involvement with Cal Poly and with my fellow alumni.

“…we should also seize the chance to reshape engineering education to better meet the needs of industry and society.”

One of the primary advancement goals, in fact, is reconnecting with more alumni and improving our communication and information systems so that we can stay in better touch with graduates. Obviously, we also need to continue the work of Paul Wright, former chair of the very successful CENG Centennial Campaign, to establish an ongoing and necessary source of funding for the college.

We’ve come a long way and I am proud of the fact that Cal Poly leads the CSU system in its fundraising efforts, but I can envision so much more, including more endowed professorships, increased funds for student scholar-
ships, and a boost in the percent of alumni giving from twelve or fifteen percent to forty percent, which is the target of most private colleges. It is my sincere hope, along with Dean Noori and the DAC, that we will soon see an endowed and named College of Engineering.

“One of the primary advancement goals, in fact, is reconnecting with more alumni and improving our communication and information systems so that we can stay in better touch with graduates.

I’m grateful and excited about this opportunity to serve my alma mater. The commitment, dedication, and vision of Dean Noori, Paul Bonderson, and so many other faculty, staff, friends and alumni bode well for the future of the College of Engineering. I feel truly honored to be an active part of it.

Kathleen Holmgren
Recently Retired Sr. Vice President,
Sun Microsystems

Engineering problems are under-defined, there are many solutions, good, bad and indifferent. The art is to arrive at a good solution. This is a creative activity, involving imagination, intuition and deliberate choice.

—Ove Arup
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Alumnus hopes to attract talented students to the AERO program

Bob and Kathleen Wulf have long supported the Aerospace Engineering program. In fact, Bob has been active on College of Engineering advisory councils for 20 years, and during 38 years at Northrop Grumman, he fostered the corporate partnership with the college, including a sizeable donation for the Advanced Technology Laboratories building.

“... I am concerned that we are graduating fewer and fewer engineering undergraduates in a society that requires technology. I want to help reverse the trend, in whatever small way I can...”

Bob graduated from Cal Poly in 1963; he holds an M.S. from USC also participated in management studies at UCLA and Harvard Business School. “One can never stop learning,” he says, “and hands-on experiences are the best methods.”

“We continue to donate to Cal Poly because Bob’s foundation for his career was his education at Cal Poly,” notes Kathleen.

“My AERO class began with 120 students and graduated 23 students four years later. We all had a great time during our four years. Space was at the beginning of a new frontier,” remembers Bob.

“Today, however, I am concerned that we are graduating fewer and fewer engineering undergraduates in a society that requires technology. I want to help reverse the trend, in whatever small way I can, by using this scholarship endowment to attract bright and talented students to Aerospace Engineering at Cal Poly.”

The Robert E. Wulf Aerospace Engineering Scholarship will be awarded to at least one freshman with high entrance exam test scores and excellent grades. The student recipient may continue to receive this scholarship for an additional three years of study, if qualified. Bob looks forward to participating in the selection process for the scholarship that bears his name.
“Striving for an energy independent future has big political benefits, and developing sources of sustainable energy has huge environmental benefits. I guess you could say my career path — working with alternative energy — is simply about saving the world! My interest in the subject was sparked by the California energy crisis in the late ’90s when I was growing up in Ft. Bragg. Cal Poly’s College of Engineering was the perfect place to study alternative energy development.

“Because I play French horn in the Cal Poly wind ensemble and the Cal Poly symphony, scholarships really allow me the opportunity to have a well-rounded college experience. I don’t have to worry about getting a part-time job and can focus on my studies and my music. It’s wonderful to know that alumni and businesses care enough about college students to provide money for scholarships. They’re incredibly helpful!”

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With some of the money I received from the very generous SWE scholarship, I purchased some class materials for an elementary school science program I’ve started with some other Poly students. The program is called SEATES — Science, Engineering and Technology in Elementary Schools — and we’re working with a fourth-grade class at Ocean View Elementary in Arroyo Grande. Our first class project was putting together a step-by-step buzzer circuit kit, a real hands-on experience in the Cal Poly tradition. I love working with young students — it’s amazing how smart they are — and the hugs and smiles we received when the buzzers sounded on the last day of the program were truly rewarding.

It’s important to get young students, especially girls, interested in engineering as a career. I was fortunate growing up in Mission Viejo to have some exposure to science and engineering but I didn’t really think about pursuing an engineering career or attending Cal Poly until I was inspired at a high school college fair. Poly just seemed like the perfect place for me. Hopefully, with SEATES we will inspire a future generation of Cal Poly engineers.
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Cal Poly parents celebrate their son’s life

Brad Yackle thrived at Cal Poly. An Eagle Scout, he was the kind of guy who could build a dune buggy out of a secondhand Volkswagen or complete an impressive senior project on the “Simulation of a Mini Digital Computer.” After graduating in 1974 with a degree in Computer Science, Brad went on to earn a master’s degree in electrical engineering at U.C. Santa Barbara and took a job in product development at Hewlett-Packard.

“When he was still in high school, Brad would go to Cal State Northridge to play with computers,” says his dad, Al. “When it came time for college, he went to Cal Poly because it had a program in computer science. My wife Ruth and I remain grateful to the professors, such as Dr. Emile Attala and others, who mentored him there. When Brad died, Dr. Attala wrote that Brad had started as his student and ended being like a son—that meant an awful lot to us.”

Although diagnosed with a brain tumor in 1984, Brad remained positive, continuing at HP and devoting himself to his wife Dotty and two children. To celebrate Brad’s life, his parents established the Brad E. Yackle Scholarship in Computer Sciences.

“We have seven grandkids, all in college or graduated—we’re proud of them all, even though none are engineers!” chuckles Al. “We think Cal Poly is a very good school and we want to encourage computer science students, but we give to Mechanical Engineering and the Library, too.

“Every year, we try to go up to the Computer Science Banquet, where they award three Yackle Scholarships. We feel the endowment is Brad’s legacy.”
“Believe it or not, Cal Poly’s reputation for its engineering program is very well known back in Idaho. I grew up in Boise and was always interested in computers and engineering. I considered other schools, but in the end I was attracted by Cal Poly’s mix of engineering classes in an agricultural environment — similar to my hometown — and was intrigued by the challenge of Poly’s ‘Learn by Doing’ thing. And it has been a challenge. I was valedictorian of my class at Eagle High School, but the classes here are very demanding.”

“That’s why scholarships are so important. They’ve probably saved my college experience. With scholarships, I can survive financially without working part time. That’s huge. The scholarships have allowed me to concentrate on school full time and I’m very grateful to the companies and individuals who support students.”

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Gary Cooper
Mark Cooper
Steven Cooper & Clara Martinez
Thelmon & Georgia Copeland
Joe & Suzanne Cota
James & Kelley Coughlin
Donald & Sandra Courtney
William Cox
A recent grad gives back what she can

It was never a question of if she would give back, but how much.

“I had a great experience at Cal Poly—when I graduated, I felt overwhelmed by a sense of how much everyone there had gone above and beyond for my education,” says Kristen O’Halloran Cardinal. “I wanted to start giving back as soon as possible, but when I sent in my first donation, I wasn’t sure they’d even take a check that small!”

A volleyball standout at Cal Poly, who was named an Academic All-American and twice received the university’s Scholar Athlete Award, Kristen graduated in 2003 with a degree in biomedical engineering. She was awarded a prestigious National Science Foundation fellowship to further her Ph.D. studies in the same field at the University of Arizona, where her husband, Trevor (Kinesiology ’03) is also pursuing a Ph.D. in physiology.

“I really believe that if everyone gives even a little bit, we can make a big difference.”

“Trevor and I decided to split our donations budget between the College of Science & Math and the College of Engineering,” notes Kristen. “Having served on my department’s Student Fee Committee, I know that Cal Poly does a great job with the money they receive. At the same time, the need to keep up with advancing technology and increased numbers of students means that the university continually needs added resources.

“Actually, I’m a big believer in education at all levels. And giving at all levels, too, because I really believe that if everyone gives even a little bit, we can make a big difference.”
“Receiving a scholarship is very inspiring — it’s like a big boost of energy — and after I graduate, I hope to put money back in to help students. I would love to contribute money toward a scholarship. It’s really nice not to be obsessed about money and not let those financial worries take away from your overall college experience.

“I’ve felt comfortable at Cal Poly from my first visit to campus. It’s a perfect fit for me. My interest in structural engineering probably comes from my father, who is a contractor in Oakdale, California. Last year, I had a dream summer for a structural engineering student, working as an intern with Shimmick Construction on the retrofitting of the Golden Gate Bridge. I was out on the bridge every day for a couple of months, truly a once-in-a-lifetime experience.”
“It was the “Learn by Doing” mantra that first attracted me to Cal Poly because hands-on learning really fits my personality type. I was fortunate a math teacher back at Oak Grove High School in San Jose told me about Poly’s reputation for engineering excellence. Once I investigated this school, I felt it had the learning environment I was seeking. It’s been a great time in my life.

“The MEP scholarship has allowed me to focus on my studies without financial duress. It has also allowed me the time to be president of the Society of Black Engineers & Scientists chapter on campus. Last spring, we took 18 club members to the SBES convention in Pittsburgh, which was very inspiring. The industry contacts we made were incredible. The support of companies that fund MEP scholarships is vital and is, of course, very much appreciated.”

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Richard & Beth Zuvella
Hal & Judy Cota

“My gift is modest, but I believe that our program is the best in the United States and I want to help see it continue.”

The Environmental Engineering program was just beginning to grow when Hal Cota joined the faculty in 1966. To help strengthen the program, Hal contributed honorariums he received from providing training to the Regional Water Quality Control Board and, later, the Air Resources Board.

“As the cost of education steadily increased, it seemed that a more effective way to give back to Cal Poly for the privilege of being part of the university was to set up a scholarship fund to support and encourage some of our outstanding students who have an interest in air pollution or noise control,” says the professor.

The Harold and Judy Cota Award goes to a senior environmental engineering student who demonstrates an interest in community public health or industrial safety and hygiene.

“Cal Poly has always had motivated, great students, who have accomplished so much here on campus and later in their professional careers,” remarks Hal. “I recall one young man who struggled and had to sleep in his car, but he made it through.

“I truly feel that my experience here has been what you might call a dream job. That doesn’t mean everything was perfect. But it does mean that I have been able to carry out my academic interests with the friendship and support of faculty across the university and with the help of outstanding students.

“There are many others at Cal Poly who have made a big difference with their time and talents. My gift is modest, but I believe that our program is the best in the United States and I want to help see it continue.”
2005 – 2006 College of Engineering Endowments

Donald E. Bently Professional Endowment in Mechanical Engineering $6,918,598.07
Constant J. Chrones and Dorothy F. Chrones Endowment Fund $3,617,265.93
Reinhold Endowment $2,872,735.80
Bert & Candace Forbes Endowed Professorship Fund $2,723,822.78
Brown Family Foundation Endowment for Engineering Excellence $2,234,105.73
Frank E. Pilling Engineering Endowment $2,076,122.10
Bert & Candace Forbes Engineering Lab Endowment Fund $1,359,172.92
J.L. Moore Fellowship $1,305,220.06
Adele Alessio Scholarship Endowment $1,128,758.12
Lockheed Engineering Professional Endowment $909,985.28
Harold R. Frank Applied Magnetics Scholarship Endowment $743,517.92
Richard & Julie Hood Endowment for Electrical Engineering $690,458.04
Constant J. and Dorothy F. Chrones Professorship Endowment $536,831.59
St. Jude Medical Corporation CRMD Endowment $431,620.56
Mechanical Engineering Discretionary Quasi Endowment $423,791.62
Litton Industries Scholarship $302,490.03
FMC Materials Engineering Endowment $300,405.57
Fund for Excellence in Computer Science $289,341.44
Air Conditioning & Refrigeration Education Endowment $259,294.94
Frank & Lauri Pilling Endowment for Senior Project $245,280.51
Don Chapin Company Scholarship Endowment $237,577.24
Paul & Virginia Wright Engineering Endowment $169,492.97
John P. Aldrich Memorial Endowment $160,836.76
James E. Brennan Swedish-American Exchange Program Endowment $135,835.68
Thomas A. & John P. Benton Memorial Scholarship Endowment $111,270.32
Walter T. Wells Scholarship Endowment $100,269.16
Brad E. Yackle Scholarship in Computer Science Endowment $94,085.39
Roy N. Poage Memorial Scholarship Endowment $88,972.69
Mechanical Engineering Faculty Professional Development Endowment $81,984.70
Reinhold Aero Eng Scholarship Endowment $76,325.82
Osteyee Family Scholarship Endowment $74,610.34
Young & Stella Louis Endowment Fund $70,687.48
Donald Chivens Memorial Scholarship $69,314.08
Allen J. Larsen Memorial Scholarship $68,270.07
Bill Evans Scholarship Endowment $67,482.35
Solar Turbines Rotor Dynamics Internship Endowment $67,155.22
Morris P. Taylor Memorial Scholarship Endowment $65,568.87
Winfield & Jane Arata Aerospace Engineering Industrial Advisory Board Endowment Fund $61,070.94
Keith Uncapher Memorial Scholarship Endowment $59,859.62
W & D Anderson Electrical Engineering Scholarship $56,964.03
G. David Jang ME Quasi Endowment $56,011.87
Tandem Computers Endowment $50,882.38
George E. Hoffman Scholarship Endowment $49,656.07
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One must care about a world one will not see.
—Bertrand Russell
“I grew up in the Midwest—Plymouth, Michigan—and had never heard of Cal Poly until a friend who had moved to San Diego told me to check it out. Like my sister who is a student in England at Cambridge, I wanted to attend college somewhere different. The first year away was rough, even with the great weather. But I stuck it out and now I just love it here. I'm planning on going to grad school at Poly, so it has become home.”

“It says a lot about Cal Poly’s reputation that there are so many companies that want to help students with scholarship money. Scholarships are very helpful. So much so in my case that I’m not sure I'd be here without them. I’m enormously grateful for the support.”

SCHOLARSHIP STUDENT
Claire Dooley
Industrial & Manufacturing Engineering

Ford/EEOC Scholarship
SWE Scholarship
Toyota Scholars Program Scholarship