

The ECE Current

ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT, UC SANTA BARBARA

DEPT HIGHLIGHTS:

- Ranked nationally in the top 3 departments in terms of research expenditures per faculty FTE, with over \$21 million in new research expenditures last year
- Out of 42 affiliated faculty, there are 25 (60%) IEEE Fellows and 8 (19%) members of the National Academy of Engineering
- Recent faculty awards include an IEEE Technical Field Award and major awards from the IEEE Photonics Society and the Optical Society of America
- 300 graduate students and about 80 new graduate students per year out of 1100 applicants
- 325 EE and CE undergraduate students, with all major teaching laboratories recently updated, including a new teaching cleanroom, and a new digital lab to open this fall
- Alumni recognized as College of Engineering Outstanding Alumni Award winners in 2008 and 2009
- Ranked 12th among all public universities in the nation in the 2010 U. S. News and World Report rankings

SENSING COAL OIL POINT AT UCSB.

SEE PAGE 3 FOR DETAILS.

Fall 2009 issue

GREETINGS, FRIENDS, COLLEAGUES, AND ALUMNI!



The ECE Dept at UCSB first moved into the top 20 ECE departments in the nation in 1982, and it is clear from the bulleted list above that, based on every measure except size, the ECE Dept today is among the very best. But the list of accomplishments does not fully capture the energy and excitement of what happens in the labs and in the classrooms on campus every day. The purpose of this newsletter is to convey the dynamic experience of the department and to put faces to that bulleted list. Indeed, it is the personal commitment to excellence of our faculty, staff, alumni, and students that makes us what we are, and I am proud of what they do and how they do it.

I also want to express our earnest commitment to stay in contact with our alumni, and to build on your successes and draw on your insights and experiences as we continue to move forward. We would love to hear from you, and we would be delighted to have you visit the campus. I hope you enjoy reading this newsletter, and please stay in touch!


Jerry Gibson, Department Chair



Professor Umesh Mishra elected to the National Academy of Engineering (NAE)

in 2009. His election is in recognition of his "contributions to the development of gallium-nitride electronics and other high-speed, high-power semiconductor electronic devices." Election to the NAE is among the highest profes-

sional distinctions accorded to an engineer.

A faculty member in ECE since 1990, Mishra has broad experience in both industry and academia. His current research focuses on electronics and photonics in the areas of high-speed transistors, semiconductor device physics, quantum electronics, optical control, design and fabrication of millimeter-wave devices, in situation processing and integration techniques, and optoelectronics.

ECE National Academy members include:

John Bowers (2005)	Herbert Kroemer (1997)
Larry Coldren (2004)	Umesh Mishra (2009)
Arthur Gossard (1987)	Sanjit Mitra (2003)
Petar Kokotovic (1996)	Lawrence Rabiner (1983)

John Bowers is the first scholar appointed to the Fred Kavli Chair in Nanotechnology.

Bowers, ECE Professor and Director of UCSB's Institute for Energy Efficiency, is recognized as an international leader in the development of novel optoelectronic devices for the next generation of optical networks.

The endowed professorship was established with a gift from Fred Kavli, a Norwegian-born physicist, entrepreneur, and philanthropist, who is dedicated to supporting scientific research and initiatives that have positive, long-term impacts on the human condition. Kavli is a trustee of the UC Santa Barbara Foundation and a generous campus benefactor.

Other ECE Endowed Chair Holders are:

Larry Coldren, Fred Kavli Professor of Optoelectronics and Sensors.

Herbert Kroemer, Donald W. Whittier Chair in Electrical Engineering.



Tunc (right) and father Kutlu Doluca at Senior Send-Off 2008.

The Doluca Family Endowed Chair in Electrical and Computer Engineering

at UC Santa Barbara was recently established through a generous gift of \$500,000 from Tunc and Lale Doluca. The Chair is intended to serve as a legacy in honor of the Doluca family and will support a current stellar faculty member with a focus on research in analog/mixed-signal design. The goal of the Doluca Chair is to grow the community of people working in this important area of research at UC Santa Barbara, while serving as a permanent tool to ensure future leadership in analog/mixed signal design by acting as a powerful agent to attract future faculty of international reputation and stature.

Tunc Doluca was born in Ankara, Turkey. He earned his Master of Science in Electrical and Computer Engineering from UC Santa Barbara in 1981. Tunc holds a Bachelor of Science in Electrical Engineering from Iowa State University. In 1984, Tunc joined Maxim Integrated Products, a small analog start-up company, as an individual contributor designing analog integrated circuits. After several promotions, Tunc was named Vice President of Research & Development in 1993. At that time he designed the industry's first high-integration, notebook power-supply IC (MAX786), and was still designing ICs until 1996. His management responsibilities continued to expand, and in 2005 he assumed management of worldwide sales and marketing. In 2007, Tunc became the President and CEO of Maxim Integrated Products, now a leading analog/mixed signal company with over \$1.6B in sales.

Tunc and Lale Doluca have two children, Ceylan and Deniz. His brother, Sinan Doluca, earned his Master of Science in Electrical Engineering from UC Santa Barbara in 1983. The Dolucas live in Saratoga, California.

Alumni Spotlight: YULUN WANG

Yulun Wang left UCSB in 1988 with a Ph.D. in Electrical Engineering and a desire to develop products rather than papers. He has since founded two companies – Computer Motion and InTouch Technologies – and the products of his work have been busy in operating theaters ever since he invented the first FDA-approved surgical robot.

Wang maintains close ties with the College of Engineering and ECE as an advisor, donor, mentor, and recruiter. His support has been recognized with the 2009 College of Engineering Alumni Award.

We talked with Wang about why he is so committed to the college.

Q: What do you think is unique about the engineering program at UCSB?

A: It is in fact quite multidisciplinary. There is good collaboration between the different departments: mechanical engineering, material science, electrical engineering, etc.

Q: How has it shaped your work?

A: The College of Engineering has been pretty fundamental to my life. The education allowed me to start two companies, both of which have been quite successful, and it's been a source of new talent. I have hired a lot of engineers from UCSB, some of our top engineers, and I think the constant dialogue with various professors here has been very helpful.

Q: How did you become interested in robotics?

A: I was in school in the 80s. The personal computer came out and then I was thinking to myself that robotics was the next step. I also enjoy things that interact with the physical world, so I kind of put two and two together.

Q: How did you come to start your first company, Computer Motion, in 1989?

A: As a finishing Ph.D., I kind of had the choice of going into academics or going into industry, and I decided that I really wanted to develop products, as opposed to do research and publish papers. I started learning about different market needs and it turned out that surgical robotics was a great opportunity to build a company and a new marketplace.

Q: How did your grounding at UCSB help you launch a company?

A: It was really contacts affiliated with the school that helped me take this academic knowledge and couple it with the business expertise that I needed in order to start the company.

Also, a UCSB engineering education is very broad and it really allows you to do anything.

I spend very little time now (as CEO of InTouch Technologies) doing what you would call “core” engineering, but I’m always participating in the engineering meetings and I can understand what’s going on. In the meantime, I still have to run the financial aspects, the manufacturing, the sales, the marketing aspects of this company. I have no MBA—I’ve never taken a business class—but an engineering degree gives you a logical thinking process. I think that’s been very helpful to me in trying to figure out how to drive all of the different areas of the company.



Yulun Wang accepting his Alumni Award at Senior Send-Off 2009.



Energy Frontier Research Center Launched

UC Santa Barbara's Energy Frontier Research Center, the Center for Energy Efficient Materials (CEEM), has been officially launched. The Center will receive \$19 million over five years to support research on materials that control the interactions between light, electricity, and heat at the nanoscale, for significantly improved efficiencies in solar energy conversion, solid-state lighting, and thermoelectrics for conversion of heat into electricity. The goal of the center, as characterized by CEEM Director John Bowers, is "to develop novel materials that will improve the efficiency of generating electricity, storing electricity, and generating light from electricity."

Funding has been released to the Center by the Department of Energy, sponsor of the 46 Energy Frontier Research Centers across the nation.

The Center is led by UCSB and is currently comprised of 21 faculty members from UC Santa Barbara, UC Santa Cruz, Harvard University, and four research scientists from the National Renewable Energy Laboratory (NREL) and Los Alamos National Laboratory (LANL). Initial support staff and an Associate Director, David H. Auston, have been hired. The center will be continuously evaluating its research programs, and funding will be dynamically reallocated to the most promising efforts. In addition to its research efforts, CEEM will be undertaking substantial outreach and educational activities in conjunction with the California Nanosystems Institute and the Materials Research Laboratory, and will be presenting a series of seminars beginning this fall.



Birds in flight: computer vision researchers are interested in accurately estimating the 3D position and motion of the birds in flight using a carefully calibrated set of cameras. Accurate models would lead to a better understanding of bird behavior, among other things.

Sensing Space and Time

Professor Manjunath, in collaboration with ECE Professors Madhow (wireless communications and sensor networks), Rose (pattern recognition), and Hespanha (controls), and Computer Science and Mechanical Engineering faculty, is setting up an expansive network of visual sensors on campus. The research would lead to a better understanding of human and animal behavior, new methods for visualization for large sensor networks, and maximizing energy efficiency through the development of building occupancy models. This network consists of both indoor and outdoor cameras on campus as well as the Coal Oil Point Reserve area that is maintained by UCSB.



The traffic circle at the east entrance to the campus. Traffic monitoring will lead to better models for urban planning and development. Cameras will gather data on some of the bike paths on campus to gain a better understanding of their usage and motion patterns at various times of the day.



This aerial view shows planned camera locations at the Coal Oil Point Reserve (COPR) to observe the habitat. The cameras will be solar powered and will communicate with the host computers using a wireless network that will be deployed at COPR. The data will be made available to researchers around the world who visit COPR frequently to study natural habitats and environment.



New lithography room, ready for use in Fall 2009.

Teaching laboratory moves to updated facility

The department's innovative and multifaceted Solid State Instructional Lab, also known as the Teaching Clean Room, now has upgraded equipment and a new space in Engineering II. Students use the Teaching Clean Room in classes where they learn to build semiconductors, light emitting diodes (LEDs), lasers, and microelectromechanical systems (MEMS). Lab manager Bob Hill says that the drastic improvement in the new lab's air quality means the students, now donning the full "bunnysuits" that are emblematic of the microprocessor industry, will see even more success when building semiconductors and MEMS. But according to Hill, equipment upgrades are ongoing and future improvements include purchasing an Electron Beam Evaporator and installing a Reactive Ion Etcher for dry etching.



Nanofabrication facility connects campus and community

Serving over 20 large and 40 small companies, researchers from 24 academic institutions, and 350 graduate students throughout the country, the state-of-the-art Nanofabrication Facility provides processing tools and equipment for designing, fabricating, and testing the latest in nanotechnology-based devices and circuits. Lab manager Jack Whaley estimates that the Cleanroom itself represents a \$20 million investment and it contains another \$25 to \$30 million in equipment. Since its inception in 1989, the existence of the Nanofab has made UCSB an early, major player in the development of nanoscience and nanotechnology, and it serves as an invaluable resource for local high-tech companies and for university researchers across the country. The Nanofab facility is part of the National Nanotechnology Infrastructure Network (NNIN) and is directed by ECE faculty member, Professor Mark Rodwell. The facility has an annual budget of over \$6 million, about \$1 million of which comes from an NSF grant and the remainder generated by charges to Cleanroom users. For more information, please visit: <http://www.nanotech.ucsb.edu/>



Graduate students working in the Nanofab facility.

Did you know?

The ECE Electronics Shop

- Inventories and tracks over 7,300 pieces of equipment in ECE research and instructional labs, ranging from large machines like HP High Frequency Analyzers to tiny precision optical components. This is the largest inventory of any department in the entire campus!

- Maintains and supports the ECE Department's seven undergraduate teaching labs, and its staff have designed and built custom electronics to be used as test equipment in the labs.

ECE Electronics Shop staff include: Paul Gritt, Technical Support Manager, Avery Juan, Principal Electronic Technician, and Raul Ramirez, Electronics Shop Assistant.

The ECE department would like to extend their gratitude to The Mericos Foundation for their generous \$1 million gift to support equipment in the Nanofabrication facility as well as the renovation and equipment upgrades in the new Teaching Clean Room in Engineering II.

Q & A with

ROGER WOOD



Professor Emeritus Roger Wood played an instrumental role in making the College of Engineering and ECE dept the examples of excellence they are today. During his tenure at the university, Wood received the Mortar Board Professor of the Year award, the UCSB Academic Senate Distinguished Teaching Award, and the UCSB Affiliates Professor of the Year Award.



Q: You were one of the founders of the Electrical Engineering Department (now ECE) and of the College of Engineering. What were the biggest challenges in establishing engineering here at UCSB?

A: The arts and letters folks thought that this was going to be a small liberal arts school and they weren't particularly keen on the idea of engineering coming. The physics and math departments loved us on the one hand because we sent a lot of students to take their classes so they could get more money that way—but they didn't like the competition. Back then we were in the arts building, strange as that may seem, because it wasn't just fine arts, it was all the other practical arts: machinery, audiovisual, and so forth.

Q: What was your educational philosophy during your tenure as Associate Dean for Academic Affairs?

A: You respected the students, you respected the faculty and you respected the needs of the institution. I had a strong emphasis on the quality of undergraduate education. We tried to take care of them and make them work. We made them work very hard, but we respected that work.

Q: Did you bring in any new initiatives that have influenced the education students now receive?

A: We put together a writing program for the engineers and it was a wonderful success. Engineers have the tendency to want to get everything right when they first put it down on the piece of paper, but you just can't do that. Just get the right ideas down, don't even worry about the order, and then cut and paste.



Wood chatting with ECE Alum at the 2009 Reunion.

Q: Over the years you have sponsored many students in internships in industry. What were the benefits for students who worked with local companies during their undergraduate years?

A: They learned a great deal just by doing it. The hands-on aspect gave the students confidence and it made real what before was on paper. They were very valuable to the companies and the experience was very valuable to the students. Many of the students would continue working with the companies; they would do something in the summer and then they would work part-time during the school year.

Q: What sparks your passion for teaching and mentoring students?

A: I would guess it's partly because I was raised to do unto others as you would have them do unto you. Respect other people. Pay attention. Figure out what they need, what is



important. One of the great rewards is seeing the light bulb go on when someone is stumbling around with something. It's extremely gratifying as a teacher to help them through something that is difficult.

Q: Do you have any words of wisdom for students beginning their engineering training this fall as freshmen, or entering M.S. or Ph.D. programs?

A: Work hard, because if you work hard you will succeed and if you don't, you won't. Don't coast, don't take it easy, and most importantly, don't be afraid to ask questions.



Wood presenting at the ECE Bay Area event.

Q: How can alumni help the College of Engineering?

A: Spread the word. Tell people how good your education was, particularly if you're talking to people with children who are looking for a good school. Tell them that the College of Engineering at UCSB is perhaps unmatched in the quality of the undergrad education and the care and concern that undergrads are given. At some places, undergrads are just people who bring in money, but that's not been the way it is at UCSB. I think that if it was an important part of your life that it is worth sharing—certainly your time, and certainly if you've got the means, monetary support. But the big thing is to spread the word.



Wood with past-Dean Matt Tirrell, Dr. Tim Cheng, and Chair Jerry Gibson at the ECE Bay Area event.



As a fellow Electrical and Computer Engineering (ECE) Alumnus, I wanted to share with you some news about a special effort to honor and celebrate the life of one of our beloved faculty members at UC Santa Barbara, Professor Roger Wood.

Roger Wood made many outstanding contributions to the ECE Department in research, service, and teaching with an unwavering commitment to his students. As the Chair of my Ph.D. committee, to this day, I remember our conversation on the way to the orals: "You will do great. Go in there and look the audience in their eyes. Remember that you are the world expert on your topic! And you know more than anyone else. Otherwise it would not qualify as a Ph.D. topic. Good luck!" Roger made a deep and profound impact at UCSB, while enhancing the lives of many of us.

The Roger Wood Endowment is being established by a group of Electrical and Computer Engineering alumni and friends as a vehicle for honoring and recognizing Roger's incredible contributions to our lives and to the UCSB campus. This initiative also provides an opportunity to help ensure the future excellence of the Department's teaching programs. Annual income from the Roger Wood Endowment will be used to support teaching activities in the ECE.

As one of Roger's former students, I am reaching out to you and asking you to consider a contribution to support this endowment. This initiative represents a great opportunity to both recognize our former mentor and to support current and future students undertaking the studies in Electrical and Computer Engineering. My wife, Marge, and I have made a Leadership pledge of \$25,000 (which we are making annual payments on over a five year period) to support this important project and I am hopeful that you will also consider a gift. Your generosity and support of the initiative at any level would be greatly appreciated! To make an online donation, please visit engineering.ucsb.edu/involvement, or contact Dan Oh, Assistant Dean of Development, at (805) 893-7723 or dan.oh@ia.ucsb.edu.

Sincerely,

Dr. Isaac R. Barpal
Electrical Engineering MS '68, PhD '70
barpal@barpal.net



Assistant Professor Michael Liebling



Assistant Professor Michael Liebling joined the ECE department at UCSB in November 2007. He studied Physics at EPFL (École Polytechnique Fédérale de Lausanne, Switzerland; MS 2000) and was granted the PhD degree from the same institution in 2004 for a dissertation on digital holography and image processing that he completed under the advisory of Michael Unser. From 2004 to 2007, he was a postdoctoral scholar in the lab of Scott E. Fraser at the Biological Imaging Center, Beckman Institute, California Institute of Technology.

Dr. Liebling's research interests are at the interface between biological imaging, optical microscopy, and signal processing. A specific area of focus is the development of microscopy instrumentation and computational tools for in vivo imaging of the beating and developing heart in various model systems, such as the embryonic zebrafish. The central aim of this research is to reach a better understanding of the interaction between heart morphology and function in both normal and diseased development. To this end, his group develops automated high-speed fluorescence microscopy imaging procedures, multi-modal, multi-scale, and multi-dimensional data registration methods, and algorithms for quantitative extraction of cell and organ morphology, blood flow velocity, and gene expression levels.



A embryonic zebrafish under microscope.

Michael Liebling received the 2004 Research Award of the Swiss Society for Biomedical Engineering. He was granted prospective (2004–2005) and advanced (2006–2008) researcher fellowships from the Swiss National Science Foundation.

Assistant Professor Luke Theogarajan



After working as a doctoral student and post-doctoral researcher work at MIT, Assistant Professor Luke Theogarajan joined the ECE department in July 2008. Before that he was a senior design engineer at Intel where he worked on the Pentium® 4 microprocessor. His research interests include combining the processing power of electronics with the versatility of synthetic chemistry to develop neural prosthetic devices, integrating CMOS circuits with nanoscale sensors to develop novel biosensors and developing simple synthetic mimics of biological function to gain a deeper physical understanding of biological phenomena. His PhD dissertation at MIT is titled, "Supramolecular Architectures for Neural Prostheses." Much of this work centered around developing a visual prosthesis in hopes of restoring vision to the blind.

Currently he is working on developing a high-density neural implant to record brain activity in hopes of helping people who have become paralyzed. He is also working on a joint project with Intel and Brown University on a novel DNA barcode sequencer using a nanopore that is integrated onto a CMOS platform. This project will hopefully aid in lowering the cost of healthcare while vastly increasing the speed and accuracy of genetic sequencing. Professor Theogarajan's fresh interdisciplinary approach, bridging computers, electronics and the life sciences, open exciting areas for collaborative inquiry.

For 2009-2010, the ECE Dept. welcomes Dmitri Strukov and Katie Byl to the faculty. Assistant Professor Strukov began in the area of Computer Engineering in fall 2009. Assistant Professor Byl will join the department in winter 2010 in the area of Robotics and Control Systems.

Student Group Spotlight

Outreach teaches students sustainable solutions

The UCSB chapter of Engineers Without Borders (EWB) is pushing the learning experience beyond the walls of the labs and classrooms and into the farthest corners of the globe.



Roy Smith, ECE professor and EWB faculty advisor, mentors the Kenya project team, which designed electric power and rainwater collection systems for a rural health clinic on the shores of Lake Victoria.

In September this year, the team prepared tanks for rainwater collection, distributed health surveys, gave water purification classes, and performed bacteria testing on the lake and several local wells.

Roy Smith, ECE Professor and EWB faculty advisor.

"It was great taking a group of students and dropping them in the middle of Africa to see how they solved problems and worked around challenges," Smith said. "Students have to be more creative and resourceful in approaching problems. They also get to see very different cultural approaches to management and problem solving and see how this affects how things are done. They are also involved in a lot more project management than they would otherwise get from our classroom curriculum."

Jock Bovington, ECE student and former EWB student president, said global outreach has affected the work of many of his peers. "UCSB's leading role in Photonics, particularly LEDs, has attracted a number of students like myself who want to really show the world what the technology is all about and many of the lighting needs of the developing world scream for that technology."



Julia Glenday giving a demonstration of a filtration method for water purification at a local school.



Scott Webb (Bren MS graduate), testing the water filtration system



Viagenco staff and EWB group (Roy Smith, Julia Glenday, Phil von Phul, Scott Webb, Fredrick Ndege, Michael Oroko, Nate Stebor) in front of the Viagenco health clinic in Luanda, Kenya.

Want to get involved?

For more information, please visit EWB-UCSB's website:

www.engineering.ucsb.edu/~ewb-ucsb
or contact
Melinda.Glasgow@ia.ucsb.edu

Faculty Awards

CONGRATULATIONS TO OUR AWARD WINNING FACULTY!

Kaustav Banerjee:

- 2008 IBM Faculty Fellow Award
- IEEE Electronic Devices Society Distinguished Lecturer

John Bowers:

- Optical Society of America (OSA) 2009 Nick Holonyak Jr. Award

Larry Coldren:

- 2009 IEEE Photonics Society Aron Kressel Award

Art Gossard:

- Al Cho Molecular Beam Epitaxy (MBE) Award at the International MBE Conference

Petar Kokotovic (Research Professor):

- 2009 Sigma Xi Monie A. Ferst Award

Michael Liebling:

- 2009 Regents Junior Faculty Fellowship

Sanjit Mitra (Research Professor):

- 2009 Athanasios Papoulis Award, European Association for Signal Processing (EURASIP)

Mark Rodwell:

- 2010 IEEE David Sarnoff Award

Robert York:

- IEEE Fellow in 2009

TEACHING AWARDS

Steve Butner:

- Outstanding Faculty Member in Computer Engineering for 2008-09

Luke Theogarajan:

- Co-recipient of the Outstanding Faculty Member in Electrical Engineering for 2008-09

Robert York:

- Co-recipient of the Outstanding Faculty Member in Electrical Engineering for 2008-09

Remembering Professor Glen Wade

by Professor Hua Lee

Professor Glen Wade passed away in June. He left in sleep peacefully due to old age. He was 88.

Glen Wade was born in Ogden, Utah, in 1921. His father was Chief Justice of the State of Utah. Glen was going to follow in his father's footsteps for a career in law, but because he had always enjoyed mathematics and physics, he went into engineering in the University of Utah instead. Then Pearl Harbor happened. He applied for Officers Training and was sent to Notre Dame. In a few months he graduated and commissioned as an Ensign. After that he was assigned as an electronics officer to go to Bowdoin College in Brunswick, Maine, to continue in electronics training. While in Brunswick, he was married to LaRee Bailey. After the war, he returned to the University of Utah in 1946 and spent two years to complete a bachelor's degree and one more for a master's degree in electrical engineering. Subsequently, he moved to the Naval Research Laboratory and worked on high-frequency and traveling-wave tubes.

After working at NRL, he went to Stanford for the PhD program and was appointed Associate Professor after graduation. He left Stanford in 1960 to work at Raytheon as Director of Engineering. In 1963, he accepted an offer to join Cornell as Director of the School of Electrical Engineering and holder of the J. Preston Levis Chair. He joined UCSB in 1966 and retired in 1991. He remained active in teaching and research during his retirement.

Glen was active in professional societies. He served as the Editor of *IEEE Transactions on Electron Devices*, Editor of the *IEEE Journal of Quantum Electronics*, and Chief Editor of the *IEEE Proceedings*. He was elected IEEE Fellow in 1962, received the IEEE Centennial Medal in 1984 and the Third Millennium Medal in 2000. Glen was also an extraordinary teacher. He received the UCSB Academic Senate Distinguished Teaching Award in 1977.



Glen's wife LaRee also passed away in July, one month after his passing. They were married for 65 years and had four daughters, Kathy, RaLee, Mary Sue, and Lisa.

Glen was a genuinely kind person and truly wonderful teacher. He will be greatly missed.

Wade's research group (1977): Larry Schlussler (PhD, 1978), Greg Lockwood (Computer Support), Scott Elliott (PhD, 1979), Behzad Noorbehesht (PhD, 1980), Nie-But Tse (PhD, 1979), Hua Lee (PhD, 1980) Ibrahim Klugeer (MS, 1978), Augustine Coello-Vera (PhD, 1978), Dr. Joseph Eisner, Professor Glen Wade, and Dr. Gail Flesher

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