

THE KOERBER PRIZE AWARDED TO CHRISTOPH VON DER MALSBURG

The Koerber Prize for Science in Europe was awarded on September 7, 2000 in Hamburg, Germany to **Dr. Christoph von der Malsburg** (Professor of Systems Biophysics, Ruhr University, Bochum, Germany as well as Professor of Computer Science, Biology and Physics at the University of Southern California) and his research collaboration, consisting of **Rodney Douglas** (ETH Zurich), **Amiram Grivnald** (Weizmann Institute, Rehovot), **Randolf Menzel** (Free University, Berlin) and **Wolf Singer** (Max Planck Institute for Brain Research, Frankfurt).

Originated by a German industrialist who died in 1992, the Koerber Prize was envisioned as an opportunity to support European research teams. The award carries support for research over a three-year period. Von der Malsburg's collaboration is "supported by the Koerber-Prize to investigate elementary functions of the brain, specifically in the visual and olfactory systems, using the most advanced research tools. The project shall elucidate how the nervous system of animals process visual stimuli during recognition of an object and shall probe into possibilities for technological application of this capability of Gestalt perception to the recognition of patterns and speech." The specific work is centered on the phenomenon of temporal signal binding which was first proposed by von der Malsburg as a fundamental principle of brain function.

Christoph von der Malsburg first came to USC in 1988 as a joint faculty member in Computer Science, Biology and Physics as part of an interdisciplinary program initiated by then Dean of Natural Sciences, **Dr. William Wagner**. This program was intended to focus on the brain, incorporating biology, computer

science and physics. As part of this program, Dr. von der Malsburg spends about half of each year on campus at USC, during which time he teaches a course titled *Neural Network Self-Organization*. He finds his best students are physicists, noting "Their mode of thinking is ideal for this type of work."

In 1991, Dr. von der Malsburg founded the *Neurocomputing Program* at the Ruhr University in Bochum, Germany. His focus has been on the binding phenomenon in the brain, i.e. the grouping of neurons on the basis of self-organized signal synchrony. "Some people see this signal coherence as the glue that gives consciousness to the brain," Dr. von der Malsburg stated. Additionally, he is the co-founder of the *Eyematic Interfaces, Inc.* located in Los Angeles, California. The company is applying the vision technology he has developed for the internet and other applications.

The Department of Physics and Astronomy joins with USC in congratulating Professor von der Malsburg and his group for receiving the Koerber Prize.

Have you visited the USC Department of Physics and Astronomy on the Internet lately?
For the latest Department news please see:
<http://physics.usc.edu>

EMPLOYEE OF THE MONTH IS AWARDED TO PHYSICS DEPARTMENT EMPLOYEE

Bill Talbert, Equipment Manager in the Physics Undergraduate Labs, received the USC Employee of the Month award for June 2000. Bill has dedicated many years to USC in the Department of Physics and Astronomy and has displayed a continuing commitment to excellence. He was nominated by **Ty Buxman**, Director of Undergraduate Affairs, with Laboratory Director, **Kris Sabo** supporting the nomination.

Bill began working for the Physics Department in 1983 when he was hired on a temporary basis to build several sets of mailboxes and help out in the undergraduate lab stockroom. His skills and work ethic quickly earned him a full-time staff position as a Laboratory Technician to work with then equipment manager **Hermann Fae**. In 1997, upon Hermann's retirement, Bill was promoted to the position of *Equipment Manager*. While he is still responsible for overall maintenance of the lab equipment, he is delighted to no longer be working during the evening labs as part of his elevated position.

When asked how the labs have changed over the past 17 years, Bill replied, "They really haven't changed dramatically. Physics is physics - the bare-bones work doesn't change." Over those 17 years, Bill has helped design and set-up many experiments, including the incline plane, moment of inertia, freefall and atwood machine experiments. In the past several years, the labs have gotten more technically oriented, with more outside industry equipment available for the students. A few of the more recent experiments he has contributed to are the bioelectric experiments in which students measure heart rates and reflex response times, and a video capture experiment that digitizes video to allow analysis of the trajectories, momentum and energy of objects in motion.

Bill has been married for 17 years and makes his home in Carson. His extracurricular activities include a deep commitment to the *Central Baptist Church* where he sings in the men's choir, donates time and energy to youth programs and works to strengthen the church in the community. For many years, Bill was a member in good standing with the *USC Staff Club*, a service oriented, on-campus organization that provides scholarships. Additionally, Bill is a master woodworker and finds great enjoyment in designing and building furniture.

As Staff Member of the Month, Bill received \$50 and a plaque presented at a continental breakfast. The Department of Physics and Astronomy joins the University in congratulating Bill and hopes that we have his wit and exemplary service with us for many years to come. Congratulations!

OUR FRESHMAN CLASS

The Department of Physics and Astronomy is pleased to welcome 13 very impressive incoming Freshman. They each show outstanding potential in their chosen major and come to USC from around the world. Welcome students.

We have six **Astronomy** students, one **Physical Science**, three **Physics/Computer Science** and three declared **Physics** majors in our Freshmen group. They hail from Brazil, Taiwan and a cross-section of the United States, including three from California, two Pennsylvanian's, Colorado, Arizona, Texas, Massachusetts, Washington and Hawaii.

We look forward to working with these bright dedicated students and are pleased they've selected USC to pursue their goals.

CONDENSED MATTER RESEARCH

An Introduction to Strongly Correlated Electrons in Solids

by Dr. Gene Bickers

One of the most active fields of research in theoretical condensed matter (CM) physics concerns the behavior of correlated electrons in solids. Whereas atomic and molecular (AM) physics treats the detailed quantum mechanics of systems of a few (less than ten to perhaps a hundred) electrons, CM physics treats the properties of electrons in macroscopic numbers (on the order of Avogadro's number in a bulk sample). Despite this difference a common feature in both AM and CM theory is the need to approximate accurately the effects of electron-electron correlations.

If each electron in a molecule or a solid could be treated independently, the quantum mechanics of these systems would be quite simple. One could write down a separate Schrodinger equation describing the interaction of each electron with an array of positively charged nuclei, then solve for the behavior of the full system by summing over one-electron results. Unfortunately the physics of many-electron systems is not nearly so simple. The reasons are as follows: (1) Electrons obey Fermi-Dirac statistics, implying many-electron wave functions must change sign when any two electron labels are interchanged. (2) Electrons strongly repel each other through a long-range Coulomb interaction.

These two features of electron systems may be crudely taken into account without giving up the simplifying framework of separate Schrodinger equations for each electron. One approximates each electron's dynamical interaction with its companions by a "mean-field" interaction with a time-averaged negative charge distribution. If this distribution is determined self-consistently and one-electron energy levels are filled according to the Pauli Principle, the resulting description is the so-called *Hartree-Fock* approximation. This is the simplest approach which

incorporates the effects of (1) and (2) above. All corrections to an AM or CM theory beyond the *Hartree-Fock* approximation are conventionally categorized as "electron correlations," since these corrections describe electrons coordinating, or correlating, their motions to lower the system energy.

The *Hartree-Fock* approximation is the basis for the description of electrons in atoms using one-electron orbitals (1s, 2p, 4f, and so forth). In solids the *Hartree-Fock* approximation also provides a useful starting point, and in most cases its predictions are at least qualitatively correct.

In some solids, however, *Hartree-Fock* predictions are completely wrong. For example, *Hartree-Fock* may predict that a solid is a metallic paramagnet, while experiments show it to be an antiferromagnetic wide-gap insulator. The neglect of electron correlations is particularly suspect in solids with small one-electron orbitals (3d, 4d, 4f, and 5f). In such systems, which include transition metal, rare earth, and actinide compounds, the electronic energy is significantly lowered by keeping electrons apart at short distances. The *Hartree-Fock* approximation, which concerns itself only with average charge distributions, ignores these important short-distance correlations.

Since only a handful of models for correlated electrons in solids can be solved exactly (and then only in one spatial dimension), this problem has been studied using a great number of approximate techniques. These techniques include (1) exact diagonalization of the quantum Hamiltonian matrix for small clusters; (2) Monte Carlo simulation of the quantum statistical partition function; (3) perturbation theory about the weak- or strong-correlation limits; (4) variational

estimation of the ground-state energy; and (5) reformulation and study of the problem using various field-theoretical methods.

A strong motivation for perfecting these techniques has come from experiment. In particular, the discovery of high-temperature superconductivity in a large number of copper oxide compounds during the late 1980's and early 1990's has increased and sustained interest in this area.

Our own group at USC has studied a variety of models using self-consistent extensions of the *Hartree-Fock* approximation which incorporate the effect of electronic charge and spin fluctuations (*category 3 above*). Our studies have been among the earliest to suggest the presence of an exotic "d-wave" superconducting transition in the most widely investigated model for the high-temperature superconductors. Experiments have now unambiguously demonstrated that superconductivity in the copper oxides is of the d-wave variety, though the electronic pairing mechanism remains controversial. Our most recent work (*a synthesis of approaches from categories 2 and 3*) has suggested a new and conceptually simple way to describe the crossover of some systems from antiferromagnetic wide-gap insulators to unconventional metals with electron doping.

The discovery of materials with novel electronic properties will continue to motivate problems in correlated electron physics in the future. It remains a theoretical goal to predict electronic properties and trends in new materials before experiments are performed, but this quantitative ability will not be achieved for some time to come.

STAFF RETROSPECTIVE

In 1995, after 12 years as Budget Analyst in the Department of Physics and Astronomy, **Henry Lee** retired from USC and left California all together. He and his wife, **Jan L. Lee** (Ph.D. USC, 1988) moved to Ann Arbor, Michigan. Jan Lee is the Director of the Undergraduate and Non-Traditional Programs at the School of Nursing at the *University of Michigan*.

As a self-employed asset manager for his mother's trust, Henry travels to Los Angeles at least once a month to meet with his attorney, accountant, investments manager and, most importantly, visit with his 87 year old mother.

Henry and Jan love Ann Arbor and Michigan. They own a beautiful home south of Ann Arbor just six miles from the *University of Michigan*. It is in the country and they have deer, chipmunks, woodchucks, raccoons and rabbits as frequent guests. "Ann Arbor has everything one would want - theatre, movies, restaurants, etc. If we ever miss the big city, we can drive into Detroit, some 45 miles west," he stated.

They are so enamored with their adopted state, they even appreciate the weather. "Yes, we have ice, snow and cold weather in the winter and hot temperatures with high humidity in the summer, but it is a much more relaxed and healthier environment. There is a saying in Michigan - there are two seasons, winter and road construction," Henry joked. However, after many years of suffering with allergies, they have virtually disappeared since moving.

Henry has also taken up figure skating, taking lessons for two years. He's attained his goal of being able to skate a few times around the rink without falling - no jumps and spins in his repertoire to date. His focus now is supporting eight young skaters from his club and watching them master the sport.

As a long-term supporter of USC and the Department of Physics and Astronomy, Henry wanted to make a lasting contribution. Working with **Tu-nan Chang**, Chair of the Department, he has developed an endowment to provide annual outstanding teaching assistant awards in the department. Henry is thoroughly enjoying life. He finds great joy in helping others, be it young skaters or aspiring physicists.

The Physics and Astronomy Department thanks Henry for his years of superior service and also for his continuing interest and generosity. Enjoy the winter wonderland in Michigan, Henry.

EXCELLENCE IN TEACHING

We would like to congratulate our graduate teaching assistants. Once again, they've done an outstanding job. Three were recently recognized at our annual department luncheon on September 22nd. **Tu-nan Chang**, Department Chair and **Henry Lee** presented the awards. (see story on page **)

Tony Lopez received the *Outstanding Teaching Assistant of the Year* honors, along with a check for \$500. Tony's work with the students and faculty is exemplary. His enthusiasm and leadership skills inspire his students. Tony is an instructor of the highest caliber.

The *Most Improved Teaching Assistant* award with \$250 was presented to **Yuxiang Luo**. Throughout the year, he has dedicated himself to improving his teaching skills and communication with his students.

Andre Koutouza was given \$250 and a *Special Recognition* award for his exceptional service to the department. Andre is extremely dedicated and was very helpful when we experienced staff shortages during the year.

The Department of Physics and Astronomy thanks all of our hard-working Teaching Assistants. The work they do is essential to our department and their skill and dedication is much appreciated. We especially want to congratulate and thank Tony, Yuxiang and Andre for their superior performance.

DEPARTMENT LUNCHEON

The annual department luncheon was held September 22nd at the Town and Gown and was a resounding success, with faculty, staff and several guests attending. Chair of the Department, **Tu-nan Chang** welcomed the guests and presented three awards to outstanding department teaching assistants (*see above article*).

The luncheon was a wonderful opportunity for old and new friends and co-workers to gather together and enjoy a delicious meal in a relaxed, stress-free atmosphere. Our thanks to all who attended.

PHYSICS LABS FOR STUDENTS IN HIGH SCHOOL

The summer program, **Physics Labs for Students in High School (PhLaSH)** was immensely successful again this year with eleven students participating from high schools throughout Southern California.

PhLaSH was conceived in 1999, by Professor **Gerd Bergmann** and **Ty Buxman**, Director of Undergraduate Affairs. They wanted to create a hands-on lab program for high school students with an interest in science. Professor Bergmann taught the pilot program that first year and it was extremely successful.

This summer, Ty Buxman organized the program. Each day of the week-long program provided a new subject. After a guest lecturer provided the theoretical background for the topic, students would work on an experiment in the morning. Before lunch, the class would take a tour of one of the research labs on campus. Lunch included informal discussions with the department faculty on a wide variety of subjects. Students then returned to the lab in order to finish their experiments in an afternoon session.

Virginia Valentine was the Laboratory Coordinator for PhLaSH. She is a third year Astronomy major and has worked in the labs during much of that time. She thoroughly enjoyed working with the students. "I wish I had something like this when I was in high school," she stated. "The students are very intelligent

and they catch on so quickly. I feel we just barely scratched the surface."

The student comments were just as enthusiastic. "PhLaSH was a wonderful experience. Whether you've taken physics before or not, you'll leave with a wealth of knowledge and experience in physics and many other things. I greatly recommend this program to any high school student interested in science," wrote one student. Another said, "I would definitely recommend this class to anyone interested in physics. It is a great opportunity to learn more about college and different fields of study in physics. You get to meet really cool students and professors."

The Department of Physics and Astronomy is continually seeking out innovative ways to promote general science to young people. As Ty Buxman states, "I believe this program is a great way to help inspire young people to continue in their exploration of physics. The combination of a relaxed setting and hands-on lab work along with a chance to talk with faculty, undergraduates and graduate students all contribute toward making this a very positive, unique experience for the students."

For more information and pictures from **PhLaSH**, go to <http://physics.usc.edu/Special Programs/PhLaSH>.

WEB SITE RECEIVES AWARDS

As an undergraduate physics student at the McMaster University in Hamilton, Ontario, Canada, Anton Skorucak, envisioned a web site that contained comprehensive information on the sciences. From that genesis in 1995, PhysLink was born.

Anton, M.S. Physics 1999, is currently a researcher working with Professor Jack Feinberg in the Department of Physics and Astronomy. He has devoted much time and energy over the past years into creating and developing PhysLink. His mission for the web site is "to provide comprehensive research and educational tools for physicists, engineers, educators, students and the inquisitive, as well as to promote the rich history of physics and bring the stories of the successes and trials to the attention of our youth." Anton also wants the site "to be a dynamic advocate for the advancement of physics and science in general, and an interpreter and inspirer for those who are not professional scientists but valued members of our society. To enhance, enchant, enrich and entertain."

If you would like to know the physics involved in throwing a frisbee and why it's shaped like it is, or the difference between the inertial and gravitational mass, or a myriad of other science questions, the answers can be found at PhysLink. Additionally, if you've been looking for that perfect Einstein card to send someone, or want to learn about the design of amusement park rides, or chuckle at science jokes, this is the site to visit.

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Alumni News



JOSE AUMENTADO

B.S. PHYSICS '94, just started a postdoctoral position at NIST/Boulder, working on the single electron transistor (SET) capacitance standard. He received his Ph.D. from Northwestern in September, 1999 and moved to Boulder in October, 2000.

CHRIS W. BOGART

B.S. PHYSICS '83, is working as a Senior Software Architect for Veridian Information Solutions in Northern Virginia.

MICHAEL BRINKMEIER

M.S. PHYSICS '92, was elected as a Member of Parliament of the German state Northrhine-Westfalia. His work field is in politics, the internet and the new economy. Prior to the May election, he served as a consultant at McKinsey & Co., Inc. From 1993 - 1997, he worked for the nobel laureate Manfred Eigen at the Max-Planck Institute for biophysical chemistry in Göttingen (Ph.D. 1996) and the Karolinska Institute in Stockholm. His Ph.D. thesis is about Fluorescence Correlation Spectroscopy.

DAVID R. BROWN

B.A. ASTRONOMY '63, has lived in Wheaton, Maryland for the past 21 years with his wife and four children, working in the aerospace industry. David currently works for Computer Sciences Corporation at Goddard Space Flight Center as a section manager in the Flight Dynamics Facility. His section supports approximately 25 scientific satellites by providing orbit determination for the in-orbit satellites, maneuver planning for a subset of the satellites and mission design for proposed satellites. They support missions in low-earth orbit, in geosynchronous orbit (GOES), and in libration point orbits at L1 in the sun-earth system and at L2 in the earth-moon system.

DAVID CASTIGLIONE

B.S. PHYSICS '85, is a System Engineer doing test planning on the National Missile Defense Ground Based Interceptor program in Huntsville, Alabama. Life outside of work is spent with his beautiful wife, Jerene and their two wonderful children.

KATARINA CICAK

B.S. PHYSICS '97, is a fourth year physics graduate student in the Ph.D. program at Cornell University. She is working under the supervision of Professor Robert Thorne in experimental condensed matter physics on transport properties of charge density waves (CDWs). She absolutely loves it in Ithaca. Waterfalls, parks, lakes and gorges make for a different scenery from Los Angeles.

DAVID COHEN

M.A. PHYSICS '94, is finishing up his Ph.D. in the USC EE-electrophysics department under Dr. A. Levi. His thesis topic is "Lithium Niobate microphotonic resonators" and should be finished early next year.

DIMITRIS A. DERVOS

M.A. PHYSICS '82, in 1982 Dimitris switched his subject area to Information Technology. Today, his academic and research interests include database systems and information retrieval/mining. He works as an Assistant Professor at the Department of Information Technology at the Technology Educational Institute (I.E.I.) in Thessaloniki, Greece.

J.K. DICKENS

B.A. PHYSICS '55, M.A. PHYSICS '62, PH.D. PHYSICS '63, let us know that due to our last newsletter, he's heard from a long-lost colleague.

GÖKHAM ESIRGEN

M.A. PHYSICS '95, PH.D. PHYSICS '97, finished his postdoc work at the

University of Georgia last year and is currently a postdoc at the University of California, Davis in their physics department. He is also a participating guest at the Lawrence Livermore National Laboratory.

EDWARD R. 'NED' FLOYD

M.S. PHYSICS '65, PH.D. PHYSICS '71, remains retired. However, he

has published two papers this year, "Classical limit of the trajectory representation of quantum mechanics, loss of information, and residual indeterminacy", *Int. J. Mod.Phys. A* 15, 1363-1378 (2000), quant-ph/9907092 and "Reflection time and the Goos-H"anchen effect for reflection by a semi-infinite rectangular barrier", *Found.Phys.Lett.* 13,235-251 (2000), quant-ph/9708007.

MARK GIAMPAPA

B.S. ASTRONOMY '76, is the Deputy Director for the National Solar Observatory. His current research program emphasizes studies of solar-type stars, very low mass stars and brown dwarfs. The facilities utilized in this research include telescopes on Kitt Peak, Arizona, and the Chandra X-ray satellite observatory.

GUNTER GIGAS

M.S. PHYSICS '59, PH.D. PHYSICS '63, came to USC from AiResearch Los Angeles, where he was Group Leader of the High Altitude Laboratory. After receiving his doctorate on the 32 MeV Linear Proton Accelerator, he joined Atomics International as supervisor of the Radiation Effects Research Group. Gunter then joined JPL/Cal Tech as a research scientist for systems design of the Voyager Spacecraft. NASA presented his group an achievement award; "For outstanding achievement in creating the most advanced and capable interplanetary spacecraft ever flown, making possible the spectacular scientific investigations of

the Jupiter and Saturn planetary systems and extended operations toward Uranus, Neptune and the Heliopause". After leaving JPL, he earned his M.D. degree, became Board Certified and is a Diplomate of the American Board of Forensic Medicine. After private practice in Los Angeles, he is semi-retired but maintains an active interest in the applications of physics to medicine.

JACKIE ALAN GIULIANO
B.A. ASTRONOMY '77, was employed by NASA at JPL in Pasadena upon graduation. For the next 20 years, he worked as a mission planner on Voyager, Galileo, the Space Station and Project Topex. He then managed an educational outreach program for the Outer Planets/Solar Probe Project. In 1998, he received his Ph.D. in Environmental Studies from the Union Institute School of Graduate Studies. After leaving JPL in 1992, he taught Astronomy and Environmental Sciences at Antioch University, Los Angeles, the University of Phoenix and West Los Angeles College. In November 1999, Jackie moved to Seattle, Washington as the Professor for Space and Earth Science Education and Multi-Media Designer for The Space Foundation, a space exploration support organization in Colorado.

RICHARD A. GUDMUNDSEN
PH.D. PHYSICS '53, has recently published a science and religion book, "Scientific Inquiry Applied to the Gospel of Jesus Christ", Bonneville Books. The book is distributed by Cedar Fort, Inc., Springville, Utah and deals with the nature of the universe in the transfinite superset of God's Eternity.

CLINT 'DOC' HARPER
M.A. PHYSICS '73, PH.D. PHYSICS '76, is the Department Head of Physics and Astronomy at Moorpark College, Moorpark, California. He writes, records and performs children's music with the Sunshine Band. Doc also keeps

busy professionally teaching short courses for technicians and engineers through SPIE and has a video course and CD-ROM in optics for engineers that SPIE markets worldwide.

DON HAVENS
B.S. PHYSICS '69, M.A. PHYSICS '72, lives in Irvine, California with his wife Kay and two children. He is currently working for Rockwell.

QIANG LUO
PH.D. PHYSICS '93, has concentrated his main efforts to teaching since he started in Peking University in 1998. While the teaching is going very well, he is experiencing pressure to initiate research and be published. Recently, the department decided to concentrate on computational physics. Qiang's plan is to continue his research program at USC. He is also exploring the possibility of collaboration with others, both inside his department and outside.

EDWARD MAJKOWSKI
B.S. ASTRONOMY '87, married Adriana Ferri in May, 1999. They now reside in Fairfax, Virginia, where Ed works as a contractor at NASA Headquarters in Washington D.C. as a Senior Systems Engineer/Windows NT Technical Lead, providing IT support for the Headquarters Server Architecture (HSA) and networking infrastructure. He also provides backup UNIX support for the email systems. Ed has worked at NASA Headquarters since August 1995.

JUSTIN O'BRIEN
M.A. PHYSICS '89, moved to New York City in 1997 after attending music school in Seattle, Washington where he studied jazz guitar. He lives on the Upper East Side in Manhattan and is Director of Financial Application Development for Forbes.com, where he's been for almost two years.

ROSHAN L. SHARMA
M.S. PHYSICS '55, has been teaching "Telecommunications Network Design" at Southern Methodist University in Dallas since 1993. The course now uses his 1997 book, "Network Design Using EcoNets", published by Intl. Thomson Computer Press in Boston and his user-friendly network design software called EcoNets.

KONSTADINOS SFETSOS
PH.D. PHYSICS '93, has held the position as Maitre Assistant at the University of Neuchatel in Switzerland since October 1999. He is married and has three children.

DAVID SUMIDA
M.A. PHYSICS '79, PH.D. PHYSICS '84, appeared on the June 1999 cover of the nation's top Laser trade magazine "Laser Focus World". The cover story addressed the topic of High Power Yb:YAG Lasers. In Spring 2000, he served on an open house committee at HRL Laboratories to host a party honoring the 40th anniversary of the Laser., which was invented at the HRL Malibu laboratory.

NANSHENG TANG
PH.D. PHYSICS '94, has been with 3D Systems, Inc. in Valencia, California since April 1997. He is Manager of Manufacturing and recently has been in charge of a new product line.

PHILLIP WISE
B.S. PHYSICS '76, M.D. SCHOOL OF MEDICINE, '82, is a urologist in San Diego. He has been married for 14 years and has three children, the youngest of which has autism. His interest is male infertility, vasectomy reversals and prostate cancer. Phillip is the vice president of the California Urologist Association and the vice chair of the Commission on Legislation in the California Medical Association. For fun, he still plays the guitar and snow ski's, however, not at the same time.

WEB SITE

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PhysLink has grown to become one of the top science sites on the Web today. It has received over 40 awards. When asked which meant the most to him, Anton mentioned *Discover Magazine* naming it the 'Science Surfing Site', NASA listing it as a 'SuperSite' in the physics resources category (a top place out of only four resources listed!), and *Science Magazine* placing it as their 'NetWatch Site'.

Anton's aspiration for PhysLink is that it becomes, "The ultimate physics resource on the Web." He seems to be achieving his goal.

Anton is currently in development on a satellite web site. This site will specifically detail Physics Departments in colleges and universities worldwide, showing the degrees available, the particular areas of research being conducted, the size of the departments (including students, graduate students, post docs, faculty, etc.), and the special facilities available. This will become an invaluable tool for those students interested in physics throughout the world.

We are proud of Anton's accomplishments and use his web site extensively within the Department. To visit the site (which as of January 2000, had over 1,000,000 visitors) please go to <http://www.physlink.com>.

Physics Phollies

When asked what time it was a physics professor replied...

"Theoretically speaking, it doesn't really matter."

While visiting our web site, please check out our Alumni pages. If you would like to update your information, or know of alumni we may have lost track of, please let us know. Send email to physicsalumni@usc.edu or US mail to the department, attention Margo Burrows.