

Physics Matters

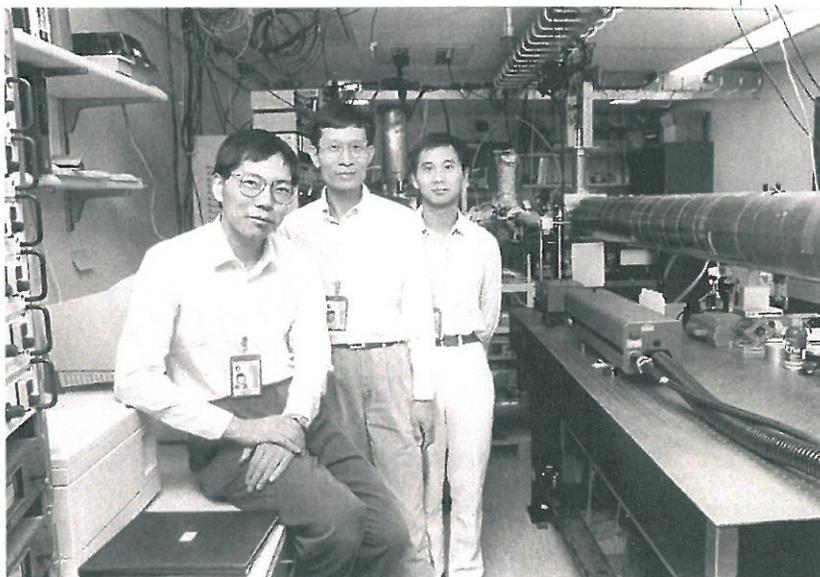
1994-95
Department of Physics

Cluster Matters

Lai-Sheng Wang, assistant professor of physics at WSU since 1993, holds a joint appointment with WSU and Pacific Northwest Laboratories (PNL), where he is affiliate senior research scientist at the Environmental Molecular Sciences Laboratory (EMSL). Lai-Sheng came to us from a postdoctoral stay at Rice University in Professor R.E. Smalley's laboratory, where he studied plain buckyballs and buckyballs with metal atoms inside.

Lai-Sheng received his Ph.D. from the University of California at Berkeley under the direction of chemistry professors David Shirley and Yuan Lee, the latter a winner of the 1986 Nobel Prize in chemistry. He did his thesis on photoelectron spectroscopy using the molecular beam method.

Lai-Sheng and his family live in Richland, Washington, where he teaches Physics and Society at the Tri-Cities campus. The course emphasizes the relationship between science and the environment and has proven to be very popular. This year he will develop Modern Physics as our first regular upper division offering for WSU Tri-Cities. His wife, Li-Qiong, also a Ph.D. from UC Berkeley, is a senior research



Lai-Sheng Wang (left), and members of his research group, Jiawen Fan, Ph.D. '91, physics (center), and Hongbin Wu, Ph.D. candidate, physics, in the lab at Pacific Northwest Laboratories.

scientist in the Materials and Chemical Science Center at PNL. They have two daughters, Roanna, 3, and Selina, 1.

At EMSL, Lai-Sheng and his students are setting up a state-of-the-art apparatus to study metal and semiconductor clusters, intermediate species containing a few atoms to a few hundred atoms. The behavior of clusters of a small number of atoms is generally quite different from that of either a simple atom or atoms in a bulk solid. These clusters bridge the properties of atoms and those of bulk solids.

See Lai-Sheng page 2.

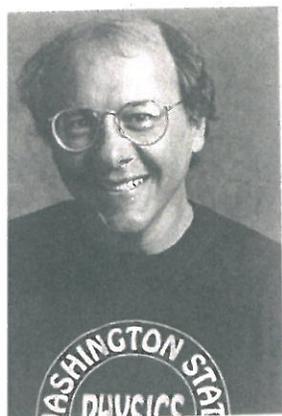
Lai-Sheng from page 1.

He generates clusters by using the so-called laser vaporization cluster beam method, the same technique by which the buckyball was first discovered. In this method, an intense laser pulse is focused onto a metal target and produces a plasma containing the metal vapor. The desired clusters are produced by condensing this high temperature plasma through the cooling effect of a helium carrier gas. A particular cluster is selected through mass spectrometry and is studied by photoelectron spectroscopy, in which the photoemitted electrons from the cluster are detected by an ultraviolet laser. The electronic structure and the quantum energy levels of the cluster are obtained by analyzing the energy distributions of the photoelectrons.

By studying a series of these clusters with different sizes, Lai-Sheng hopes to learn how the discrete energy levels or molecular orbitals of the small clusters are transformed into energy bands in bulk solids as the cluster size increases.

Lai-Sheng's research also touches upon nanophased materials since stable clusters, like buckyballs, can serve as building blocks for new nanophased materials with novel properties. He is also interested in using oxide clusters as models to study environmentally important oxide systems, such as the silicon oxides. This research is supported by the U.S. Department of Energy through PNL. His cluster research is also supported by a grant from the National Science Foundation.

Greetings from the Chair



Michael Miller, Chair
Department of Physics

The past year was highlighted by another successful faculty search. Our new assistant professor is **Steve Tomsovic**, who will fill **Jim Park's** vacated position. Steve received his Ph.D. from Rochester in nuclear theory but during his postdoctoral stints changed his research emphasis to quantum chaos. For the past few years he was a visiting assistant professor at the University of Washington, where he worked closely with **Eric Heller**. He followed Heller to Harvard when the latter was hired to head the new NSF Atomic and Molecular Theory Center. Steve's brother, **Kevin**, is a member of the WSU electrical engineering faculty.

Steve and his wife, **Janice**, a computer software consultant, have two children.

We have a new fiscal specialist, **Jan Bartlett**, who comes to us from the Department of Chemical Engineering. Originally from Michigan, she and her husband live in Deary, Idaho. Our previous specialist, **Ronda Quist**, left after she graduated from WSU with a major in speech and hearing. She is now doing an internship in the Seattle area.

Last summer the department was the local host for an NSF-sponsored LASE workshop. The purpose of the workshop was to help high school teachers integrate lasers and optics into their curricula. Eleven teachers attended from Spokane, Post Falls, Orofino, Colfax, Palouse, DeSmet, Pasco, and Pullman. The

workshop was organized by **Professor Gareth Williams** of San Jose State University. It will be repeated next summer for an additional 10 to 12 teachers.

By the way, our building is now the Webster Physical Sciences Building. It was named in honor of long-time WSU regent **Kate Webster**, Seattle, distinguished community and civic leader.

Because of the department's continued emphasis on the more practical and applied side of physics, we continue to do well. We again have close to 60 graduate students, and we anticipate expending nearly \$2.5 million from grants and contracts. Not bad for 14 faculty!

This year we have begun a substantial push to improve our undergraduate major program. A committee of several faculty, led by **Tom Dickinson**, is examining various ways in which the undergraduate major will be a more useful and desirable degree. This includes developing a program for students whose object is not to go on to graduate school for a Ph.D. in physics. With a core of courses from the usual major, we are examining sets of cognate courses that could provide entry into jobs or graduate work in applied optics, semiconductor technology, medical physics, computer simulation and modeling, and science education. We would certainly appreciate any ideas and opinions from our alumni. We are also developing a freshman honors physics course in coordination with the chemistry department.

The department joins me in wishing you all the best.

Mike Miller, Chair

Around the Department

Al Butler underwent heart surgery in September 1994 in Spokane. He is doing well, and we wish him a speedy and complete recovery.

Yogi Gupta received the President's Faculty Excellence Award for Research. The award was presented by **President Smith** during convocation ceremonies.

Jim Park retired from the physics faculty last January. He came to WSU 27 years ago after obtaining a Ph.D. from Yale in theoretical physics. The department arranged a reception for Jim and **Marion**, which was attended by the faculty, staff, and some of Jim's former students. We chipped in and bought Jim a laser printer as a retirement gift.

Henry Kapteyn won the 1993 Adolph Lomb Medal from the Optical Society of America. One of the organization's top 10 awards, the medal was presented to Kapteyn at the OSA annual meeting in Toronto, Canada, October 1993.



Tom Dickinson (right) and Jim Park share anecdotes at Park's retirement party.

Mark Kuzyk received the Naval Reserve Officer Training Corps Faculty Excellence Award for the 1993-94 academic year. This award was for "superior commitment to the quality of education given to our midshipmen, as well as the student body as a whole."

Philip Marston has won a two-year grant totaling \$100,000 from NASA to conduct research on basic fluids problems that could aid in the development of materials under microgravity. Marston is one of 50 researchers across the country selected out of 217 applicants for the ground-based research funding program. His current work is related to a research project carried on in the space shuttle *Columbia* in June 1992.

We were honored with visits by two Golden Grads at this year's Class of 1944 Reunion:

Although **George Fullmer** was a WSU physics major from 1940 to 1943, he obtained his B.S. in physics from UW in 1947. Nonetheless, he tells us he is a "Cougar at heart." Fullmer served as a USAAF meteorology and air traffic control officer in the CBI theater during World War II. More recently, he re-

ceived the American Nuclear Society's 1992 Award for Meritorious Performance in Reactor Operations. The award, given "for a lifetime of dedicated service that contributed to the safety, efficiency, and performance of the Hanford production reactors," is on display in our thesis display cabinet in the physics faculty-staff lounge in the Webster Physical Sciences Building.

Fullmer began his reactor operating physics career in 1947 with GE in Richland, Washington. In 1971 he joined GE-NE in San Jose. He is now retired and resides with his wife, **Mary (Rusty)**, in Los Gatos, California. Their daughter, **Cathy Tusler**, a 1970 WSU graduate, lives with her family on Bainbridge Island. Their son, **Andy**, was an architecture major at WSU, 1968-70, and served as artistic coordinator on the Disney animated feature, *The Lion King*.

Carl Robert and Virginia (Edsall) Lagergren also visited during the Class of '44 reunion. Lagergren received B.S. and M.S. degrees in physics from WSU. During World War II, he spent two years in the U.S. Naval Reserve, Pacific theater. He obtained his Ph.D. in physics from Minnesota in 1955. He spent his career in analytical research and instrumentation development in mass spectrometry at the Hanford facility in Richland, Washington. He was employed by GE, Battelle, Rockwell, and Westinghouse and retired in 1991. He and **Virginia** have three children: **Ken**, a dentist practicing in Richland; **Alice**, a physician's assistant in Boise; and **Linda**, a civil engineer for the Washington State Department of Transportation.

The friends and members of the physics department congratulate the following faculty and staff for reaching their 25-year anniversary: **Tom Dickinson**, **Jerry Tripard**, and **Wiley Wilson**.

Tom George Elected Fellow of AAAS

Tom George was elected a fellow of the American Association for the Advancement of Science for "research in the theory of laser-induced chemical physics, nonlinear optics, molecular collision dynamics, chemical reactions, energy transfer, molecular clusters, and surface and solid-state chemistry/physics." A theoretical chemist-physicist and provost at WSU, Tom holds appointments as professor in both the physics and chemistry departments. He has a very rich program, which includes dynamics and spectroscopy of matter in various phases, including optical scattering from fractal objects and optical properties of semiconductors and polymers.

Alumni Achievements and News



Patrick Arnott

Patrick Arnott (Ph.D. 1988), an assistant research professor at the Desert Research Institute, Atmospheric Science Center, Reno, Nevada, is involved with cirrus cloud particle characterization. In the picture—taken in a trailer at an Australian air force base in Townsville, Australia—Pat is preparing the DRI ice crystal replicator for flight before a mission on the NASA DC8 research aircraft.

The replicator is usually installed on the wing of the aircraft and is operated from a station on board. The purpose of the replicator is to record, by impact on a liquid plastic film, particles in the atmosphere the plane happens to fly through. The main interest is to capture small ice crystals—sizes less than 100 μm —at the tops of cirrus clouds. Data from the replicator is reduced using video microscopy and digital image analysis.

Gary Lee Bennett (Ph.D. 1970) was elected a fellow of the American Physical Society in November 1993. His award is on permanent display in our thesis display cabinet. In May 1993, Gary received a performance award for outstanding work in the formulation and initiation of the 1993 Pluto Fast Flyby and TIMED small spacecraft technology programs. Gary took early retirement from NASA on July 1, 1994. He and his wife plan to move to Idaho, where they bought 40 acres near Emmett last year.

Edwin A. Karlow (M.S. 1968; Ph.D. 1971) received the Thomas and Violet Zapara Award for Excellence in Teaching at the June 1993 commencement at La Sierra University, Riverside, California.

President's Academic Honor Roll

We are proud to announce the names of the following physics students who earned places on the President's Honor Roll for spring 1994.

Orion Carlisle, South Bend
Daniel Guenther, Clarkston
Jennifer S. (Reece) Hille, Otis Orchards
Leslie H. Miles, Pullman
Julia Plummer, Spokane
Colette A. Sacksteder, Seattle
Einar J. Stauber, Genesee, Idaho
Jason J. Swift, Seattle
Dane R. Vinson, Vancouver, Washington
Ken Guo Chi Yang, Beaverton

Theses and Dissertations

If you have a copy of your physics thesis or dissertation, we would like to have a departmental copy bound and displayed. If you are interested, please send it to us; we will copy it and return it to you by Federal Express. Copies of former student theses and dissertations already on display are listed below.

Ph.D. Dissertations

Aidun, John B.
Anderson, Gordon D.
Arnott, W. Patrick
Barnett, Claude C.
Bhatti, Allah D.
Bjorkman, Michael Dean
Bloomquist, Douglas D.
Byers, Ronald E.
Craig, Jr., James H.
Curran, Donald R.
Dean, Cleon E.
Dick, Jerry J.
Doering, Dale L.
Doran, Donald G.
Durrer, William G.
El-Hussaini, J.M.
Fan, Jiawen
Flock, Robert Alan
Frederickson, Carl K.
Ghebremichael, Fassil
Gilmore, Todd
Glenn, H. David
Gupta, Yogendra M.
Hayes, Dennis B.
Hixson, Robert S.
Hughes, David H.
Johnson, James N.
Jones, Scott C.
Kaduchak, Gregory
Kargl, Steven G.
Kidron, Naftali
Klakken, Michael L.
Koller, Lee R.
Kulawansa, Digala M.
Langford, Stephen C.
Langley, Dean S.
Larson, Lawrence A.
Lebsack, Donald E.
Lehr, William J.
Lerman, Noah
Lindsay, Richard H.
Lonney, Lawrence W.
Loudiana, Michael A.

Ma, Zhen-Yi
Mace, Jonathan L.
Majewski, Peter Paul
Matula, Thomas J.
Michaels, Thomas E.
Muratov, Leonid S.
Nelson, William Frank
Ogilvie, Kendal M.
Perry, Frank C.
Poga, Costantina
Rabie, Ronald Lee
Rosenberg, Gideon
Sheffield, Stephen A.
Shropshire, Steven L.
Simmons, Ralph F., Jr.
Simpson, Harry J.
Singh, Jagan Nath
Singh, Rudra Pal
Snyder, David B.
Unger, Bruce T.
Vorthman, John E.
Wang, Zhenming
White, Richard W.
Williams, Kevin Lee
Yang, Yang

M.S. Theses

Anderson, Gordon
Backus, Sterling
Barnett, Claude C.
Baümer, Stefan M.
Billette, Stuart C.
Curran, Donald R.
Hussain, Muhammad Y.
Jang, Hwa-Jae
Lee, Sunkyo
McGhee, Gregeory A.
Meeves, Bruce H.
Moen, Allen L.
Niaz, Javed
Sy, John C.
Zhang, Ligang
Zimmerman, Kurt A.

Letters from Our Alumni

The letters we receive from you, our physics department alumni, are always greatly appreciated. We hope to hear from more of you. We are very interested and would like to share your accomplishments with your fellow alumni and our current students. If you like, use the enclosed envelope to keep in touch.

...As Mr. [Al] Butler mentioned in his "Early Memories," I also got the impression that physics was basic to all engineering, so it was soon after enrolling in WSU in the fall of 1946 that I altered my plan from becoming an Electrical Engineer to becoming a Physicist. The generality of the education has served me well in my career as I adapted to different job assignments within The Boeing Company over some 25 years of service. Among other things I was involved in developing The Boeing Engineering Thermal Analyzer (BETA), pioneering post-manufacturing automatic checkout of the Apollo/Saturn S-IC stages, doing postflight Trajectory Reconstruction for the launch vehicles for the Saturn V flights as well as determining Lunar Impact Trajectories for spent S-IVB stages, developing Test Program Sets (TPS's) for automatic checkout of B52 bomber and Peacekeeper missile electronic boxes, and finally ending my career working initial verification planning for the Space Station program.

I retired from Boeing management effective Jan. 1, 1992, and am now located in Heber Valley, Utah, enjoying the second year of a welcomed retirement. I am grateful for the education received at Washington State and for the support it has enabled me to provide for my family (of seven children) through the years.

*Raymond D. McCurdy (B.S. 1950; M.S. 1953)
Heber, Utah*

...The day following Pearl Harbor, Dr. Anderson, head of the physics department, advised us, "This war will be won with technology. Your job is to further your technical education [not run down to the armory, as many were doing, and enlist]." We discovered later that Dr. Anderson and other WSC physics profs were active in secret radar research with MIT, and Dr. Anderson's instrumentation innovations to correct for atmospheric inversions contributed significantly in the Pacific naval battles.

*George C. Fullmer (physics major 1940-43)
Los Gatos, California*

...I wish to thank you for the great Physics T shirt. In these days where what one wears must make a statement, you have come up with an extraordinary example. "Save the Whales," "Stop Clearcutting" are quickly read and understood without much thought by onlookers. I notice viewers of the Physics T shirt have a rather blank look as they carefully study the message, apparently in hopes of finding something understandable. Those who ask questions want to know who "Schroder" might be and what all the funny looking symbols are. Attempts to explain this results in a rather glazed look and a change in topics of discussion.

I do need a little help with respect to Schrödinger's cat. I vaguely remember (at 70 all remembrances are a little vague) hearing about his cat, but when I am asked how it fits in with the T shirt I am at a dead loss. I tried looking in texts without any luck. Evidently his "cat" does not make the index of any book that I have found.

*Dale L. Martin (B.S. 1948; M.S. 1950)
Bellevue, Washington*

[Jim Park, who responded to Dale's letter, notes that the cat appeared in a famous story Irwin Schrödinger used to illustrate an enigma in the interpretation of quantum theory. The anecdote and a discussion can be found in the book, *In Search of Schrödinger's Cat*, by John Gribben.]

[The following excerpt is from a letter received by Al Butler in December 1993.]

...After leaving WSC, I spent two years at Caltech, struggling to escape with their consolation prize, an M.S. One gets to rub elbows with a lot of bigwigs, but the pace was fast.

Then, three years' work at Puget Sound Naval Shipyard (where my Dad was still employed); my first job was "naval architect"(!) which was really structural engineering, but after six months I got into the "Scientific and Tests" branch as a physicist. We analyzed ship vibrations and also made tests on a steam catapult on a carrier.

Back to school at Oregon State U., where I eventually got a Ph.D. for a theoretical thesis, atomic structure calculations (lithium atom wave-functions).

In 1960 I got a job on the faculty of the University of Puget Sound here in Tacoma, where I eventually rose to the level of incompetence predicted by the Peter Principle (full prof., dept. chair for ten yrs). I'm now retired but still active on local parks committees and as volunteer consultant for one of the parks (setting up a weather station in a new nature center).

*Bert E. Brown (B.S. 1949)
Tacoma, Washington*

"Loose Lips Sink Ships": Part I

by Alfred Butler

During World War II, "loose lips sink ships" was a common saying, cautioning U.S. citizens to be careful of what they said. It warned people how simply an enemy might pick up information that could be very detrimental to our country. I know of three instances where this might have been the case. Just the most seemingly innocent things but with real potential for problems. Since these are not common knowledge, let me tell about them. Knowing about these instances seems to make me a lot less demanding for exact information from the military, knowing that very simple things may give aid and comfort to the enemy.

The first happened on the club car of the New York Central's Twentieth Century Limited on a trip from New York to Chicago. The chief freight agent of the NYCRR was enroute and decided to go to the club car for some refreshment or news before going to bed. As he entered the club car he noticed that there were only two other men there. They were some distance apart and didn't appear to know one another. One was reading a newspaper and the other seemed to be engrossed in a magazine. After some time, one of the men got up, put his reading matter down and prepared to leave the car. As he passed the second man he quietly said, "I hope we don't have any problem at Hanford. Wilmington wouldn't like that."

That was all. Nothing else was said, and it was the first that the freight agent had any idea that the men knew each other. At this point, however, his freight agent mind went to work. Wilmington probably meant Wilmington, Delaware, the home of Dupont, the big chemical company. But Hanford? As he searched his brain he thought of Hanford, Washington, a ghost of a town alongside the Columbia River on a branch of the Milwaukee Railroad. Ahah! This would be a good spot to locate an ammunition plant, and Dupont would be a likely company to build it. This could mean lots of railroad business. So the agent dropped off a telegram as the train stopped for a couple of minutes at Albany, to his agent in Wilmington. The telegram said to contact Dupont the first thing in the morning and ask them for the business which was going to Hanford.

Almost as soon as the freight agent got to his hotel in Chicago the next morning, he was visited by several FBI agents. They wanted to know what information he had about Hanford. Now, he didn't want to get the men into any difficulty as they certainly hadn't meant to let anything slip, so he tried to fake it by saying something like Hanford would be a likely place for Dupont to build as it was quite isolated, etc. The FBI wouldn't buy that and convinced him that this was a very serious business; they had to know his source of information.



Al Butler lectures to a physics class in the late 1950s.

After assurance that the men, if truly not breaking their secret, would not be punished, the agent explained what had happened. The federal agents were surprised. The two men were top U.S. scientists. They were traveling under assumed names. They were traveling separately on their way west, with this being the only time when they were on the same train. Both of them would certainly have rather died than give any such vital information to the enemy.

With an assurance that the NYCRR would receive its fair share of the business and a caution that this was not to be mentioned, the matter was dropped. Fortunately, no Japanese or German informer had been in the club car that night, and the secret was broken with the dropping of the first atomic bomb on Hiroshima several years later.

"Loose Lips Sink Ships" will be continued in the next issue of *Physics Matters*.

Al Butler, former physics faculty member and renowned educator, earned bachelor's and master's degrees (1935 and 1944, respectively) from Washington State College.

Scholarship Recipients, 1994-95

Nathaniel Hicks, Cheney, received the Paul and Dian Bender Freshman Scholarship in Physics.

Charlotte H. Yoemans, Spokane, received the Claire May Band Freshman Scholarship.

Winners of the Claire May Band Scholarship (for women beyond their first year) were **Nicole L. Dawson**, **Jennifer S. Hille**, **Leslie H. Miles**, **Julia D. Plummer**, and **Colette A. Sacksteder**.

We are looking for additional scholarship funds to support talented freshmen. We would appreciate any donations for this purpose. By the way, any donations for Campaign WSU (announced by the WSU Foundation in October) can be so designated.

The Department of Physics Honor Roll of Donors

We are proud to report the names of the following individuals who have contributed to the Department of Physics in the last several years. Their generosity enables us to build programs of distinction and provides direct support to our students and faculty. We extend our warmest thanks to our donors and encourage others to join them in support of our department.

Laureates

(\$1 million or more in lifetime gifts)

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+William & +Claire May Band
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Larry & Margaret (Fleming) Nielsen '67
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Dale & Leila (Cook) Martin '48, '51

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Frank '60 & Irene Barmore

Donald '58 & Eva (Brownhill) Beale
Gary '70 & Cleo Bennett
Robert '74 & K.D. Bohara
William '50 & Eunice Boyd
Bert E. Brown '49
Eugene '60 & Margaret Burke
Russell & Kathleen (Dahl) Caldwell '70
Charles '69 & Sharyn Cole
Robert S. Cooper '72
David & Teresa Cremers '80
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Leslie '37 & Carolyn Edwards
J.G. '83 & Dian Field
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Julian L. Frese '39
Jeffrey & Kris Furrer '84, '86
Thomas A. Granberg '71
Stacy K. Irwin '90
Gerald & Mary (Skidmore) Johnson '37, '40
LeRoy '71 & Joanne Johnson
Scott & Judy Jones '81, '82
Edwin '68 & Marilyn Karlow
Larry & Susan (Steinhaus) Kimmel '71, '73
Robert '47 & Christy Kinkaid
Wilton H. Kuehn '74
Carl & Virginia (Edsall) Lagergren '44, '50
Mark '79 & Mary Linquist
Chelcie & Katherine (Kyte) Liu '62
Gary L. Lucas '61
Brent & Janet Malgarin
James '52 & Jacqueline McCoy
Raymond '50 & Grace McCurdy
Sergio L. Monteiro '81
Ira '48 & Betty Myers
Robert '65 & Patricia Parry
Bradford Pate & Toshiko Ichiye
Carl A. Paul '72
Allen L. Pitner '64
Warren & Bernice (Birkhofer) Quinn '51, '46
Mario Rabinowitz '64
Carl E. Rosenkilde '59
Victor '51 & Shirley Schmidt
Robert P. Sharp '65
Ralph '77 & Linda Simmons
Harry J. Simpson '88
Daniel '84 & Barbara Sisk
William & Carolyn (Frantz) Slippert '51, '61
Paul R. Spencer '63
Brad S. Stapleton '90
Mildred Stephenson
Richard '64 & Jan Stout
James Thomas & Mary Bartholomew '76
John '59 & Kathleen Wacker
Theodore Watanabe '48
Johannah M. Webster
Jack '62 & Judith Westerman
M.N. & Elaine (Liu) Wise '68, '65

Sustaining

Paul '86 & Cheryl Adams

James '56 & Joann Albers
Christos Bandis '91
Claude '56 & Betty Barnett
Harry '75 & Rita Beeler
Stuart C. Bilette '86
Scott B. Bolon '88
James '49 & Dorothy (Crosby) Burgess
Randy C. Carr '89
David Cissell '69 & Julie Zalikowski
Lewis '72 & Mary Coleman
Charles '70 & Carron Collins
Mark P. Conner '88
Robert '69 & Rose Cunningham
George '69 & Bernice Danker
Kenneth B. Dodson '74
C.Q. & Ruth Ford
Michael B. Gallagher '68
Oliver M. George '25
Timothy J. Haugan '86
George Hauser '71 & Margaret Lacy
Clarence '66 & M.K. Hinrichs
Jay '68 & Catharine Holberg
+Angus L. Hunt '59
Patricia B. Hunt
Bruce J. Jackson '77
Henry '66 & Linda Jones
Lee R. Koller '78
Mark & Patricia Kuzyk
David W. Langford '76
Dean '80 & Lea Langley
Lawrence '79 & Brigid Larson
James '53 & Jean Lonborg
Robbe & Gloria (Aylesworth) Lyon '70, '73
David '51 & Patricia McDaniels
John & Helana (Haytas) McIntosh '92
Everald '68 & Patricia Mills
Dean A. Millsap '53
Baldev R. Patyal '88
Earl '36 & Mary Peabody
Claude & Ruth (Simons) Pevey '32, '33
Fredrick '64 & Denise Reinke
James '54 & Norma Rollins
John & Rhoda (Setterberg) Roper '71, '67
Donald '63 & Terre Rottler
Ivan & Beverley (Becker) Rouse '74, '72
John N. Sanders '81
John '50 & Carolyn Schauble
Frederick '67 & Lila Schultz
Xiao-An '84 & Amy Shen
Leonard '68 & Deborah Slack
David & Suzanne Spencer Uvelli '66
Robert '68 & Margaret Stephenson
Robin R. Townsley '83
David '73 & Elizabeth Unger
William J. Vail '85
Anthony R. Vannelli '72
Mathias & Cornelia VanThiel
Raymond '72 & Betty Warner
Duane P. Wessels '90
Gordon E. Williams '56
Jeffrey & Pamela (Gamble) Wirth '75

+ Deceased

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Each year our student Call-A-Coug callers help us keep in touch with you. If we didn't reach you, please use the attached envelope to make your gift. And don't forget to tell us about the special events in your life so we can share them with your fellow alumni. It is always a pleasure to hear from you.

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Photo Update

We would like to thank Ed Donaldson, Ray McCurdy, Roger Moe, and Jack Schauble for providing the identity of "unknowns" in the 1952 physics

department photo we printed in the last issue of *Physics Matters*. We rerun the photo with all identified.



The Department of Physics, 1952. L. to r., kneeling: A.B. Butler, K.E. Fitzsimmons, Frank Peters (glassblower), Warren Quinn, William F. Nelson, John Barton. Sitting: William Band, Richard M. Brown, S. Town Stephenson, Lois Blackmore, Paul A. Anderson, Thomas Stinchcomb, I. Dale Riggins. Standing, front row: Angus Hunt, William

Cannon, Dave Bushnell, Jack Schauble, Earl Emery, Kelly Marshal, Don Miller. Standing, back row: Reuben Krogstad, Dave Freeman, Raymond D. McCurdy, Roger Moe, Perry Wilson, Raymond Nelson, John Guptill. Ed Donaldson was not in the photo.