INSIDE A MOUNTAIN IN JAPAN, A BOAT PADDLES INTO PARTICLE PHYSICS

The neutrino detector Super-Kamiokande
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Greetings,

It’s been almost as good a year as I can recall in the 34 years that I have served the Department as faculty member and, since 1983, as Associate Chair.

We had one of the largest graduating classes in the country this past spring. Forty-two students earned a physics degree at the University of Washington. Thanks to aggressive recruiting, our graduate program is also very strong. Twenty-nine new students, with an average GPA of 3.67, entered the UW this fall. Two years ago, we had half that number.

The days are over when physics students focused on an academic career. More and more, physics majors are flocking to jobs in industry. Here at the UW, we know that half of our undergraduate majors go into the workplace right after college. Even among our graduating Ph.D.s, about half eventually look for positions in industry. (My son left academia for the private sector where he has prospered.)

The current success of the Physics program at the UW is due in part to our response to that reality. In today’s job market, where positions in academia are few and far between, we take seriously our mandate to prepare students for a wide variety of careers. Our students can obtain a physics degree by taking many related subjects, such as astronomy, atmospheric sciences, geophysics and the biological sciences. Here, students acquire a technical know-how and ability to analyze problems which puts them head and shoulders above other job-seekers.

Our former students report that the strong laboratory experiences they receive as undergraduates are especially valuable in the job market. For example, five recent physics majors have found employment with SYNRAD, a local company that is a world leader in the production and development of carbon dioxide lasers. When students leave our program, they carry with them the priceless skills of being able to take apart and reassemble electronic equipment, build a computer, and turn a PC into a data acquisition device.

A major focus of my first year as chair will be to build a student job network outside of academia. This is where I seek your help. Are you interested in becoming a mentor? Can your company provide internships?

We are doing our part to keep our department strong. I am pleased to report that we have hired three outstanding new faculty who will add greatly to the strength and vitality of our department. Paula Heron provides outreach in physics education and connects us with the engineering school, Gordon Watts gives us a presence in the D0 experiment at Fermilab in Chicago, and Mike Romalis works on tests of fundamental space-time symmetries of nature. For more about these faculty, see page 6.

On a sadder note, we lost two of our most esteemed faculty last fall. Ken Young and Ronald Geballe died within a week of each other in October and November, 1998. Memorial funds have been set up both to honor their memory and help the Department in recruiting graduate students. See the back cover of this newsletter.

We have an opportunity to influence the future of some of the brightest students in the Northwest. As the new chair of the Physics Department, I am anxious to provide the best opportunities for them and I welcome your involvement. Please help us guide the UW Physics Department into the new millennium.

Sincerely,

David G. Boulware
Jeff George "bugging" the metal chassis be built to hold the sonar system that was the UW's contribution to DUMAND.

Jeff George never thought he'd make it through graduate school.

"I expected to be washed out at any moment," says George, who came to the UW in 1991 from a small Seattle college where he was one of only five undergraduate physics majors. "The UW could have kicked me out after my qualifying exam and I would have felt completely fulfilled by my grad school experience."

Not only did George graduate, he really earned his Ph.D. While in graduate school at the UW, he helped solve a problem which has been plaguing physicists for decades — the mystery of whether neutrinos, one of nature's basic building blocks, contain mass. George won the Physics Department's most coveted award, the Henderson Prize, for his Ph.D. thesis on the subject.

George came to the UW from Seattle Pacific University with his sights set on atomic physics. No research funding was available, however, and he began looking for another project. "Jeff Wilkes started to talk to me about neutrino astrophysics and DUMAND," says George, "and in less than an hour he had me hooked." George decided to join Wilkes' research group. "The idea was to build a detector strung on strings anchored to the ocean floor," he says.

DUMAND, however, was a stillborn experiment. When DOE cut its funding after a crucial component was destroyed by seawater, George switched to Super-Kamiokande, then in its final phases of completion. This neutrino detector is a 50,000 ton tank lined with 18,000 light amplifiers. Super-K is buried in a zinc
mine 3,000 feet under the Japanese Alps, about 125 miles west of Tokyo.

Jeff George arrived in Japan in December 1995 to join the international collaboration on Super-K. He and his UW team worked on data acquisition for the outer part of the detector. Sound dry? Not when Jeff George describes it.

"You drive your car down an underground tunnel, right up to the tank lid," he says. "You enter the tank through a large hatch in the lid and drop straight down through open space to the water surface on a small gondola. The water is crystal clear, and to ride down to the boat is like descending into an enormous cathedral filled with golden jewels. The mid-air gondola ride is exhilarating, but the sight of those shining phototubes is breathtaking."

The thousands of phototubes in the tank were there to "catch" light produced by neutrinos, tiny and elusive particles which very rarely interact with matter. If a neutrino did collide with water molecules inside the tank, it would produce a charged particle which would, in turn, emit a flash of Cherenkov radiation — ultraviolet and blue light in a characteristic cone-shaped pattern — that could be captured by the phototubes. Depending on what kind of neutrino it was — and Super-K was built to detect both muon and electron neutrinos — its light pattern would be different.

For years, particle physicists had wondered why they saw so few muon neutrinos, compared to electron neutrinos, in their experiments. Their theoretical models had predicted a lot more. If they could prove that muon neutrinos were changing into tau or electron neutrinos, that puzzle would be solved. If scientists counted fewer light flashes than they expected, it would mean some of the neutrinos were changing "flavor" before they passed through the detector — something they could not do unless they had mass.

Super-K started up on April 1, 1996 at midnight, with about fifty Japanese and American politicians and scientists in attendance. George's team was ready — but barely. "We had gotten the outer detector to show particles for the first time about two hours before the ceremony," says George. The first evidence that neutrinos were changing form inside the tank was most likely recorded that same night.

The results turned the Standard Model of particle physics, which states that neutrinos have no mass, on its head. "This is something that physicists have hoped for and eagerly sought for decades," said John Bahcall of Princeton, a long-time neutrino hunter. One significance of the finding is that neutrinos could account for some of the "missing" matter in the universe.

Jeff George graduated from the UW in July 1998. Now at Caltech in Pasadena, he is researching galactic cosmic rays, particles which fly through space at very high energies. Working with data from a spectrometer on NASA's Advanced Composition Explorer spacecraft, which is "parked" in space between the earth and the sun, George recently observed and measured several isotopes of cosmic rays for the first time. These discoveries may eventually help scientists determine the origin of cosmic rays.

Important as George's research has been, his most lasting impressions of the UW come from teaching. He fondly remembers teaching Physics 110 with Ken Young — physics for liberal arts students. "I had to make physics relevant to them," says George. "I had to show them why physics works the way it does, without getting bogged down in the 'how.'"

Eventually, Jeff George hopes to return to the Northwest to teach physics. Meanwhile, he intends to get as wide a base in research as he can. "The more I learn," George says, "the more I can bring to the classroom."
FACULTY KUDOS AND WELCOMES

WE WELCOME ... 

NEW ASSISTANT PROFESSOR GORDON WATTS
Gordon Watts’ research is focused on the world’s most powerful accelerator at Fermi National Laboratory in Chicago. At the D0 experiment, Watts is responsible for the “trigger” which selects interactions to be written on tape and analyzed. The goal is to find evidence for particles predicted by the current “Standard Model” — or better yet, to find evidence which would lead scientists to new, simpler, more comprehensive models of the building blocks of matter. An excellent and fascinating account of high energy physics in general, and D0 in particular, can be found at the Fermilab website (www.fnal.gov).

AND APPLAUDS THE PROMOTIONS OF:

MICHAEL ROMALIS
Romalis has been working with Norval Fortson on further improving the sensitivity of the mercury atom experiment. As a new Assistant Professor, he plans an experiment using Xenon liquid, which is 100 million times denser than the presently-used mercury vapor, and is expected to yield even higher sensitivity. Much of Romalis’ research will involve a novel, extremely sensitive magnetometer, with possible applications reaching far beyond fundamental physics research.

AND...

PAULA HERON
The goal of Heron’s research is to improve the teaching of physics at every level. Recently named Assistant Professor, Heron works with the Physics Education Group, which is nationally known for its accomplishments in this field. Heron’s new position was created by the Provost’s Office in recognition of the contributions that the Department,

through the Physics Education Group, has made to K-12 science education. Heron is actively involved in research, instruction, and the development of curriculum for introductory physics courses and the preparation of teachers. Her research focuses on difficulties that students encounter in applying concepts from introductory physics in their subsequent studies in physics and engineering. Read more about Heron’s work at www.phys.washington/groups/peg.

AND WE CONGRATULATE ...

NORVAL FORTSON
Atomic physicist Norval Fortson, UW faculty since 1966, on being elected to the National Academy of Sciences. Fortson’s laboratory uses small-scale, table-top experiments to probe basic forces normally studied with much larger (and much more expensive) high-energy accelerators. Instead of high-energy, this approach uses extremely high precision in looking for extremely small effects of new forces and interactions. See the Atomic Group web page at www.phys.washington.edu/~fortson/intro.html.

AND...

WICK HAXTON
Nuclear astrophysicist Wick Haxton, UW faculty since 1984, on being elected to the National Academy of Sciences and the American Academy of Arts and Sciences. While his work spans several areas of physics, a primary area of his concentration is nuclear astrophysics, including solving the puzzle of why there aren’t enough neutrinos coming from the sun. Haxton is also interested in the mechanism by which massive stars collapse into dense neutron stars while ejecting their mantles in spectacular explosions called supernovae.

PH.D. DEGREES AWARDED, 1998-99

BRADLEY S. AMBROSE
Lillian C. McDermott
3/19/99, Investigation of student understanding of the wave-like properties of light and matter

ENRIQUE R. BATISTA
Hannes Jansson
6/11/99, Development of a new H2O-H2O interaction potential and application to molecular processes in ice

JIU-NII CHEN
Martin Savage
8/20/99, Effective field theory for nuclear physics

DOUGLAS E. DAVIDSON
Marcel P. Den Nijs
8/20/99, Fluctuating steps on crystal surfaces

THEODORE J. FREEMAN
George K. Parks
12/17/98, A study of fermi acceleration of suprathermal solar wind ions

KEITH L. FROST
Laurence Yaffe
6/11/99, From instantons to sphalerons: thermal baryon number nonconservation in weak interactions

KRISTI R.G. HENDRICKSON
E. Norval Fortson
8/20/99, Measuring parity nonconservation using a single trapped barium ion

STEPHEN E. KANIM
Lillian C. McDermott
6/11/99, Investigation of student difficulties in relating qualitative understanding of electrical phenomena to quantitative problem-solving

DAVID E. KAPLAN
Anne E. Nelson
8/20/99, Flavor mediated supersymmetry breaking

continued on page 11
The 1999 Nobel Prize in Physics was awarded to Gerardus 't Hooft and Martinus Veltman, for "elucidating the quantum structure of electroweak interactions in physics."

The first difficulty is to correctly pronounce the name 't Hooft. Our resident expert, Prof. Marcel Den Nijs, informs us that it is pronounced "ut Houft" (in two distinct words, meaning "the head" in Dutch).

The second, more substantial difficulty is to explain, in non-technical terms, what it is that is being honored. Veltman, speaking on Dutch television, joked of his struggles trying to explain his work. He said: "It is a difficult and abstract subject and something that I have never been able to explain to my wife and children."

Here is an attempt to explain the subject to an interested non-expert. The current Quantum Field theories of Nature are afflicted by a problem: when calculating some basic properties such as mass or charge of the electron, or rates of interactions between particles, we get an infinite value, in a dramatic conflict with reality. At first sight, the way in which this is resolved is just a "fix:" simply re-define, "renormalize" the values by a subtraction of another infinity. In fact, this procedure is quite sensible: the theory deals with "bare" or "naked" isolated particles. However, in reality each particle is surrounded by a cloud of virtual particles of all kinds (i.e. it is "dressed"), and it is the mass and charge of these dressed particles which should be finite. Clearly, we must insist that the number of infinities which are cured be much larger than the number of necessary subtractions (a theory with a "fix" necessary for each prediction would have no predictive power at all). Theories for which a small number of subtractions cure all infinities are called "renormalizable."

The theory of electromagnetic interactions was shown to be renormalizable in the 1940's. A remarkable illustration of this success is closely connected with the UW Physics Department: the value of the electron's magnetic moment, measured by our own Nobel Laureate (1989) Professor Dehmelt and his colleagues, compares with the theoretical value as follows:

- measured value: 1.001 159 652 ...
- calculated value: 1.001 159 652 ...

Steve Weinberg says: "The numerical agreement between theory and experiment here is perhaps the most impressive in all science."

In the late 1960's, several physicists including Weinberg worked out a field theory describing the weak interactions. However, the proof of renormalizability turned out to be very difficult for Weinberg as well as for his colleagues. In fact, these difficulties caused some real doubts and pessimism about the prospects of Quantum Field Theories in general. To quote Steve Weinberg again: "we were not clever enough."

It was a 23-year old Dutch graduate student who was clever enough to accomplish this proof. In 1969 Gerardus 't Hooft started to work on the problem under the supervision of Professor Veltman, and just two years later the problem was solved. The electroweak theory became a respectable and indispensable part of what is now called the "Standard Model" of elementary particles.

The Nobel Committee decision is not always greeted with unanimous approval. Sometimes, the field being honored is questioned; sometimes, the selection of individuals is controversial. This year, both the teacher and the student are recognized for a truly fundamental contribution to our understanding of Nature. It is pure joy.

Vladi Chaloupka
GRANITE, MUONS, QUARKS AND GLUONS

TALK ABOUT A MOVING JOB.
It took five strong men and the world’s most powerful forklift to move 25 tons of granite into the basement of the UW’s Physics-Astronomy building last December.

“They had to cut a ten-foot hole through a wall that holds up the building,” says physics research engineer David Forbush, who supervised the move. “People were nervous.”

Getting the 10’ x 15’ table-shaped rock into the building took three days. But that’s nothing compared with the work it took to dig this piece of white granite out of a mountain in Colorado, grind it flat, and ship it to Seattle in the first place. When you add moving costs to the price of the table, this piece of rock cost a cool hundred grand.

This very expensive table can now be found in a clean room in the basement of the Physics building, where Dave Forbush is learning how to measure it. “It’s got to be flat, because our wires have to be precisely aligned,” Forbush explains. Now, the table is flat to one-quarter of one-one-thousandth of an inch. The future of particle physics at the UW may depend on its staying that way.

During the next four years, parts of the world’s largest particle detector, ATLAS, will be built on this granite table. The components will be shipped to Geneva, Switzerland to the European Laboratory for Particle Physics (CERN), along with detector components now being built by physicists in 35 other countries. When all the pieces of ATLAS have arrived in Geneva, the $500 million detector, consisting of layers and layers of smaller detectors, will be assembled 92 meters underground.

When it’s finished, ATLAS will resemble a can of soda that’s about 60 feet tall. It will straddle one of several caverns inside the Large Hadron Collider (LHC), a huge tunnel 16 miles around that already exists underneath the suburbs of the city of Geneva. LHC is filled with superconducting magnets that will whip beams of protons in both directions to almost the speed of light. ATLAS and its sister detector will catch particles created in the fallout from protons colliding head-on.

Physicists from Seattle to Sydney are beside themselves at the experiment’s prospects. “The Large Hadron Collider will generate the highest-energy atomic particles ever created by human beings,” says UW physicist Paul Mockett. “If new particles exist, we will find them.” Physicists are hoping to find the Higgs boson, a particle which in theory, gives matter its mass.

With such a discovery, the field of particle physics would take a whole new direction. That is why, for the first time, the U.S. government is helping to fund the construction of a particle collider outside the country. There are about thirty players involved in the U.S. contribution, which is funded by the National Science Foundation and the Department of Energy. Paul Mockett and Henry Lubatti are the lead scientists at the UW, and a large number of physics students and other faculty will also be involved.

The American physicists will collaborate on building particle detectors for the endcaps of Atlas to catch the
most elusive charged particles. These are muons, produced when protons collide at very high energies. Physicists believe muons are sometimes the “offspring” of the Higgs boson — so the presence of muons may indicate the presence of the mysterious and much-hunted Higgs. “In particle physics, when something decays, what it decays into is very much of interest,” says Mockett. “Decay products from Higgs are often muons.”

In the basement of the Physics building, on the granite table, Dave Forbush is supervising the construction of the first of 96 “muon-catchers” — particle detectors for the endcaps of Atlas. They consist of pieces of aluminum shaped like trapezoids, to which six or eight layers of aluminum tubes are glued. Each tube contains a hair-thin tungsten wire placed exactly in its center. The UW team will make 38,000 of these tubes.

When the Large Hadron Collider is launched, protons will run around the underground tunnel at the highest energies since the Big Bang. Powerful magnets will lure protons into ATLAS, where they will bash together, breaking up into quarks and gluons. The shower of particles will be filtered through ATLAS’ many layers, where their behavior will be recorded. At the detector’s outer ends, muons will escape through the tubes being built at the UW, leaving little “footprints” of freed electrons. These electrons will zap the wires inside the tubes, causing sudden spikes in voltage.

“From those spikes, we’ll have to infer exactly where the muon went through,” says Mockett, “to the width of a human hair in precision.” The researchers will be able to track the muon’s journey through the detector back to the original collision point, where the muon broke off from its parent particle. By making detailed observations about the muon, they will have clues about the particle from which it came.

If in a significant number of collisions, it looks like muons are coming from the same parent particle, it will make physicists very happy. “Then we can say, ‘Aha, this is a Higgs boson decaying into muons,’” says Mockett. “Nobel Prize for somebody.”

A diagram of the ATLAS detector. Parts in gray indicate the UW’s contribution.
DARRELL RETIRES

Do you remember Darrell Scattergood?

If you went to the UW within the last thirty years, you probably do. That’s how long he was administrator of the Physics department.

Maybe you went to his office, where his desk was invariably foot-deep in papers, for a bit of unofficial career advice. Perhaps you’d run into him in the basement, holding court in the shop. Maybe, when you were younger, you were even in his Scout troop.

A native of New York state, Darrell Scattergood was in graduate school in physics at the University of Arizona when Boeing came knocking on his door. “They made me a beautiful salary offer,” Scattergood recalls, “and the World’s Fair was in Seattle. It was very glamorous.” Scattergood accepted the job as an electronics research engineer and moved to Seattle in 1962. When he invented an ion beam deposition system to make integrated circuits without using masks, Boeing was sufficiently impressed to ask Scattergood to join an elite group of scientists whose research was mostly unconnected with making airplanes. “It was quite a blue sky atmosphere,” he recalls.

Literally, Scattergood joined the Geoastronomy group, where he tracked atmospheric damage to supersonic flights, among other things. Boeing was about to fall on hard times, however. “My boss had warned me the clock was ticking,” Scattergood says. With tuition paid by Boeing, Scattergood enrolled in business school. He was one of the UW’s first part-time MBA students.

In 1967, one year after he graduated, Scattergood left Boeing to work for Ronald Geballe, the chair of the UW’s Physics Department. “There were no formalities,” recalls Scattergood. “Ron just said, ‘Darrell, I want you, when can you start?’” Scattergood was the first official departmental administrator at the university — now, virtually every UW department has one.

Darrell Scattergood left his mark on the UW in many ways. The instrument-makers in the physics shop, for instance, will never forget him. In the early 1970s the Washington State Higher Education Personnel Board threatened to change the job classification of instrument-makers to that of less-skilled machinists, who are paid less. (Salaries for these positions are set by the state.) “If the Board had succeeded,” says Heinz Guldenmann, former shop foreman, “it would have been impossible to attract the caliber of tradespeople the Physics Department needed.” Scattergood went down to Olympia to testify in support of the instrument makers. “He went to war for them,” says Guldenmann. Today, instrument-makers all over the state retain the more favorable job classification, thanks partly to Darrell Scattergood.

Then, there was the new Physics-Astronomy building, a 10-year process from design through construction. According to Mark McDermott, department chair at the time, Scattergood was on top of every detail. “He bird-dogged that operation,” says McDermott. For a project so huge, the building process was relatively smooth. It stayed on schedule and came in under budget by almost $2 million. “We did a good job,” concedes Scattergood today. (Maybe he should have been in charge of building Safeco Field.)

Darrell Scattergood is a long-time outdoorsman, and the founder of the Young Mountaineers, an outgrowth of the Seattle Mountaineers Club. Before that, he had a Scout troop and an explorer post for many years. Often, former members of his Scout troop, grown up into UW college students, would show up in his office to say hello.

One thing people probably won’t miss about Darrell Scattergood is his interoffice memos. “We called them Scattergrams,” laughs Mark McDermott, “long memos on short subjects.”

One of Scattergood’s most vivid memories — when Hans Dehmelt won the Nobel Prize — happened in the shop in the old Physics building. “Hans said we should have the celebration in the shop,” remembers Scattergood, “because the instrument-workers played such a big part in his success.” (They worked long hours helping Dehmelt build his elementary particle traps. You can still see these traps today in the display cabinets in the Physics building.) “The president of the university even came down to the shop to congratulate Hans,” says Scattergood. “It was quite a glorious occasion.”

That memory brings a wistful tone to Darrell Scattergood’s voice. “For me, one of the great honors of working here has been to meet many great men of science,” he says. “Almost all of them have treated me as an important member of the science community.”

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established a graduate fellowship. The Ronald and Marjorie Geballe Endowment will provide periodic awards to outstanding graduate students in physics. The goal is to reach an endowment level of $100,000.

KEN YOUNG
Ken Young suffered his second heart attack on October 23, 1998 and died on November 6 at the age of 61. He grew up in Vancouver, British Columbia and attended the UW as an undergraduate, receiving his Ph.D. from the University of Pennsylvania. After a distinguished career in experimental particle physics, he switched to experimental astrophysics. At the time of his death, he was in the middle of a groundbreaking experiment showing that the elusive neutrinos do have some small but definitely non-zero mass (related article on page 4). Ken was also a dedicated teacher, helping to establish the Physics of Music course at the UW; more recently, he created a new and very successful course in the physics of sports. Ken loved music, played the cello and sang well. He was also a passionate sculler.

Ken was fun to have around. He had the uncanny habit of apparently dozing off during seminars and meetings, only to suddenly “wake up” and ask an incisive and very relevant question. He is greatly missed by all.

The Ken Young Memorial Fund, established by his family and friends, will be used to support graduate students.

FOR MORE INFORMATION ABOUT THE RONALD GEBALLE OR KEN YOUNG MEMORIAL FUNDS, OR TO MAKE A CONTRIBUTION, PLEASE CONTACT LINDA NELSON AT 206-616-9652 OR lnr@phys.washington.edu.

Darrell Retires, continued from p. 10

Newly-retired, Scattergood is not spending time reminiscing. Over the summer he installed central heating in his house(!) and began putting on a new roof. He took a hiking trip through the North Cascades and went kayaking for eleven days on Canada’s west coast. And there’s so much more to do. “I have a great curiosity about many things,” Darrell says. “I expect I’ll spend one day a week in the library.”

Ph.D. Degrees Awarded, continued from p. 6

JONATHAN J. KARAKOWSKI
Gerald A. Miller
12/17/98. Can the neutron polarizabilities be determined in a compton scattering experiment?

CHRISTIAN H. KAUTZ
Lillian C. McDermott
8/20/99. Identifying and addressing student difficulties with the ideal gas law

DAVID J. KAY
David A. Jay
12/17/98. Mixing processes in a highly stratified tidal flow

SHELLEY D. KELLY
Robert L. Ingalls
3/19/99. XAFS study of the pressure induced B1 to B2 phase transition

MICHAEL P. KELLY
Kurt A. Stover
3/19/99. Highly excited nuclei: does the width saturate?

FRANCOIS B. LEPEINTRE
David B. Kaplan
12/17/98. Supersymmetric models of flavor

MICHAEL E. LOVERUDE
Lillian C. McDermott
6/11/99. Investigation of student understanding of hydrostatics and thermal physics

BRIAN L. MASON
J. Gregory Dash
12/17/98. An experimental investigation of charge transfer during ice contact interactions

ANNA V. POIARKOVA
John J. Rehr
3/19/99. X-ray absorption fine structure Debye-Waller factors

ALLEN C. PRICE
Larry B. Sorensen
3/19/99. Coherent soft x-ray dynamic light scattering from Smectic-A films

JOHN Y. PUTZ
Joseph E. Rothberg
6/11/99. A measurement of the branching fraction of the Ds meson to a muon and a neutrino

ROBERTO C. RAMOS
Oscar E. Vilches
8/26/99. Liquid-vapor coexistence in two-dimensional 3He-4He mixtures

VADIM L. TSEMENKHMAN
David J. Thouless
12/17/98. Charge relaxation, current distribution, and breakdown of the quantum hall effect
RONALD GEBALLE

Professor Ronald Geballe passed away on October 28, 1989 at the age of eighty. A native of California, he studied atomic physics at Berkeley and came to the UW in 1943 to do research for the Navy. Geballe joined the physics department faculty in 1945, where he and his graduate students worked on electrical discharges in gases and atomic collisions. In 1957 Geballe was named Chair of the Physics Department. In his sixteen years as chair, Ron Geballe guided the department's evolution into a nationally-known research center. He later became Dean of the College of Arts and Sciences and Dean of the Graduate School.

Ron Geballe and his wife, Marjorie, had a generosity and enthusiasm which helped bring people together, both within the Physics Department, the university at large, and the international physics community. Geballe also provided leadership in many physics organizations, and led national efforts to improve physics education in high school and college. While he retired in 1985, he was actively involved in science education until the day before he died.

A committed civil libertarian, Geballe joined a UW faculty group in the post-McCarthy era that successfully challenged a loyalty oath imposed by the state of Washington. The lawsuit, which went all the way to the US Supreme Court, prevented other states from imposing such oaths.

In honor of Ronald Geballe's many contributions to the University of Washington, his friends and colleagues have