WOODSIDE . PORTOLA VALLEY . SHARON HEIGHTS
LADERA . STANFORD HILLS . SKYLINE . portions of
WEST MENLO PARK and ATHERTON

Controlled Circulation
Postage Paid At
Menlo Park, Ca. 94025

the Country Almanac

Section 1 of 2 sections | 20¢ Copy | 3030 Canada Lane, Box 4033, Woodside, California | Phone 851-0730 | VOL. XI, NO. 11 | NOVEMBER 10, 1976

Nobel Prize winner's new building block

Lightning—in the form of a Nobel Prize—has struck Stanford for the eighth time.

Professor Burton Richter of the Stanford Linear Accelerator Center has been selected to receive half of the world's highest honor in physics for a discovery at the Stanford Linear Accelerator which may herald a new level of order in man's understanding of the fundamental building blocks of the universe.

Professor Richter and Dr. Samuel Ting of the Massachusetts Institute of Technology will share the $160,000 international prize for their independent discoveries of a whole new family of particles which have revolutionized thinking about the basic consituents of matter.

"It is all very unreal," Dr. Richter commented in his office overlooking the linear accelerator. However, he is rapidly coming out the fog under the mundane realities of buying tickets and getting reservations for himself and his family to go to Stockholm for the award ceremony in December.

It was two years ago this week that Dr. Richter's team, working through the night at SPEAR (Standord Positron-Electron Accelerating Ring), discovered a new and unexpected peak in the production of certain nuclear particles as the energy of the particles colliding in the ring inched up above 3.1 billion electron volts. A frantic weekend of measurements and analysis confirmed that the "very sharp peak" represented a new particle—named psi and pronounced sigh—which had startling different properties from those previously observed in the laboratory or predicted by theory. "Psi" is three times heavier than a proton, according to Dr. Richter, and lives some 1000 times longer than the theories said it should—that is it lasted all of .00000000000000000001 seconds before disintegrating into more familiar particles.

"Instant confirmation" of the existence of the new particle came from Dr. Ting who discovered the same particle at almost the same time by a completely different experiment. He named his particle "J."

"Psi" was created when electrons and positrons rotating in opposite directions in the ring at the end of the accelerator collided; it was then found by tracking the particles created when it disintegrated. As any youngster who follows space programs and science knows, electrons and positrons which are their anti-matter equivalents annihilate each other in an explosion of energy when they meet. By contrast, Dr. Ting's "J" particle was discovered at Brookhaven Laboratory on Long Island by bombarding beryllium with fast protons from a different type of accelerator.

By the time the parallel discoveries were published in the same December issue of "Physical Review Letters," they had created a tidal wave of excitement in the international physics community. Dr. Richter explained, "The discovery created a huge furor because high energy physics has been floundering. There have been many ideas and little experimental evidence to back them.'

Professor Richter and his team of 38 physicists are continuing the age-old search for the fundamental building blocks of matter in the ring at the end of the linear accelerator's two-mile beam tube. Here they are bringing the whole arsenal of modern technology, science, and computers to bear on the thesis first posed by Democritus 2500 years ago: that all matter is made up of indivisible units, which Democritus called "atoms" from the Greek word meaning indivisible.

The atom has long since proved spectacularly divisible, and the search for a fundamental particle has continued to the nucleus and beyond. But Dr. Richter still poses the same basic question, "Is there a simple underlying structure?"

PROFESSOR BURTON RICHTER will receive half the Nobel Prize in Physics for the discovery of a new family of sub-atomic particles made at the Stanford Linear Accelerator Center.

Dr. Richter's discovery gives new hope that there is. It strengthens and gives new direction of the "quark model" of the structure of nuclear particles. This is a model that was proposed some ten years ago to try to explain the apparent chaos in proliferation of sub-nuclear particles in terms of fundamental building blocks called quarks.

Dr. Richter described the confusion in elementary particle or high energy-physics as the search for the basic constituents of protons, neutrons and electrons turned up "literally hundreds" of new elementary (?) particles. When the search for a fundamental order brings you to a system with hundreds of particles, it becomes "uneconomical" in a philosophical sense, Dr. Richter explained.

The lexicon of names given to the new particles and their properties in recent scientific literature suggests the degree to which the physicists themselves were confused by the new abundance. A sample of the "strange" particles includes hadrons, baryons, bosons, leptons, mesons, and quarks, plus their complementary anti-particles. These have exhibited new properties classified as strangeness, charm, and color (red, white, and blue).

As originally proposed, the quark model attempted to explain the sub-nuclear particles as being made up of three fundamental constituents—or building blocks—called quarks, Dr. Richter explained. However the number of quarks proposed—three—violated the basic sense of simplicity, order, and symmetry which scientists were seeking.

The new particle, psi, was the first of the sub-nuclear particles that could not be explained within that framework, Dr. Richter said. But an extension of the quark model to include the more symmetric number of four quarks can fit the psi particle into the quark model. It reinforces the model and gives new direction to research. "It is clear there must be at least four fundamental building blocks," Dr. Richter said.

"For the moment the discovery of the psi particles answers more questions than it raises," Dr. Richter commented. Since its discovery ten-to-15 more of the same type have been discovered, he noted.

Dr. Richter, a soft-spoken man who lives on the Stanford campus with his wife and two children, is a diligent worker, often arriving at the office at 7 a.m. He directs the team of 38 physicists from Stanford and the Lawrence Berkeley Laboratory of the University of California who carry out the immensely complex and technical operations necessary to extend the frontiers of basic science.

Dr. Richter has pursued an unswerving interest in science since high school. By the time he was a freshman in high school he knew he wanted to go into either chemistry or physics, he said. And by his first year at the Massachusetts Institute of Technology, he knew it would be physics.

In his spare time? "I play squash, I ski, I go to the opera ... and I loaf," he said.

What will be the next questions that future research will address?

Dr. Richter looked ahead. "If we have found there are not three but four quarks, one of the questions is, 'are there more?' " He noted there are two schools of thought on this question. One says there are a finite number of building blcoks, and we will eventually get to Democritus' true atom; the other believes there will be more and more layers of building blocks like a Chinese puzzle.

"We can never prove we have reached the end—but if you go up in energy and don't find more, there is a real assumption you can stop," Dr. Richter said.

The next step to reach this goal is the construction of the positron-electron storage ring (PEP) which is planned to begin at the east end of the linear accelerator next spring. The new ring will give scientists about four-to-five times more energy to study whether there are still more building blocks. "They should show up in this range," Dr. Richter said.

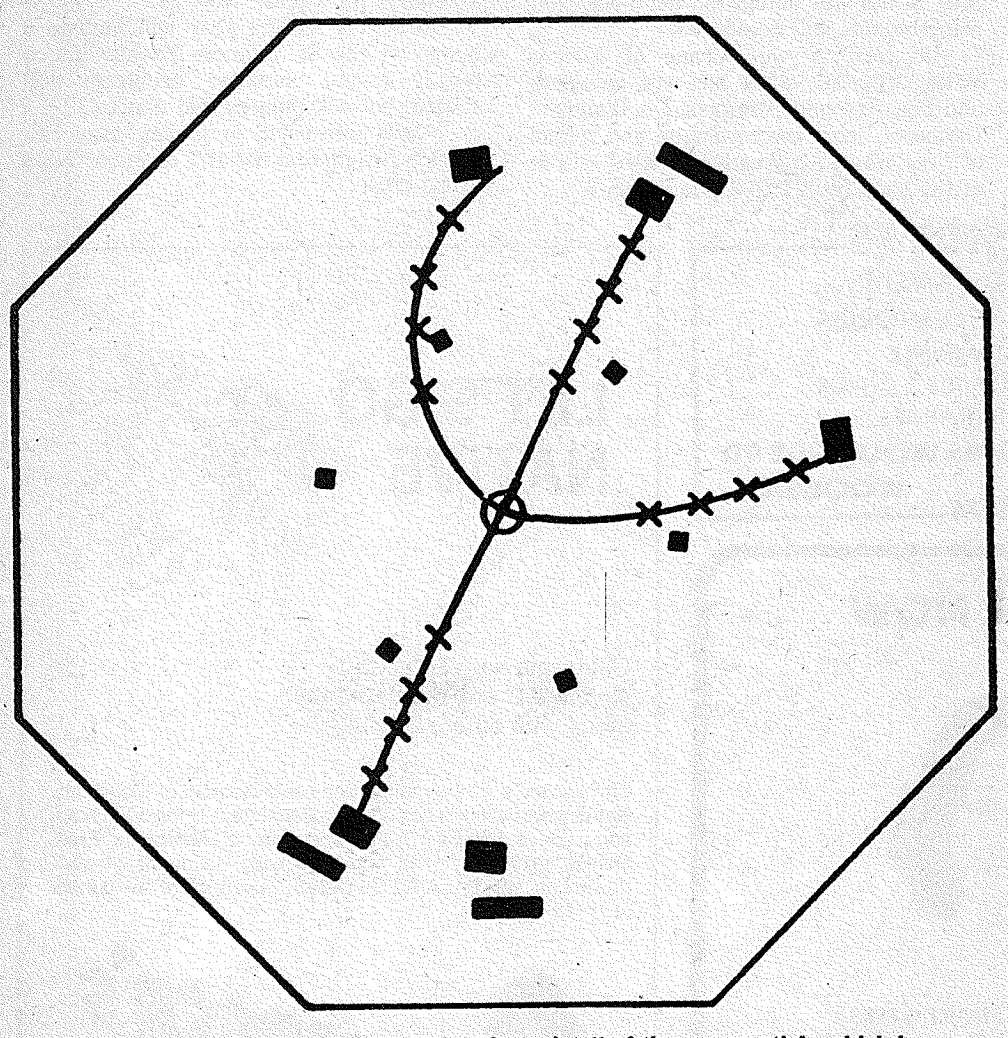
Another reason for building the new facility is to give scientists a further opportunity to study the forces which hold matter together. So far there are four of these although scientists since Einstein have been searching for ways to tie them together. Dr. Richter named the fundamental forces—gravity, electron-magnetism, the strong force that binds the nucleus together, plus "the weird one," the weak interaction that is responsible for radioactivity. "Are any of these related?" Dr. Richter asked. He hopes that the new storage ring will give some answers.

Dr. Richter talked about the fundamental value of basic research in contrast with practical applications.

"Whether the quark will have any practical application I don't know," he said. "Ask the question in about 50 years."

At the present moment particle physics

Continued to page 2



TRACK OF THE "PSI": Here the "footprints" of the new particle which has shaken up modern high energy physics form its name—the Greek letter "psi." One of thousands, this particular event shows the tracks left when a "psi" particle decayed in a magnetic detector. The straight tracks were made by a positron and an electron; the curved tracks by plus and minus pions. The "psi" was created when a positron and an electron collided in an experimental area at the end of the Stanford Linear Accelerator and annihilated each other. The picture was reconstructed from data fed into a computer. (Picture from "SLAC Beam Line," January 1975.)

Farm Hill school site sale

The 40-acre Farm Hill campus of the Sequoia Union High School District is slated for sale at $1,866,000 Nov. 10. High bid for the surplus site was presented by Harrington-Kulakoff of Palo Alto in joint venture with Morris Carpo, a condominium and high rise developer from the Philippines.

Walter Harrington submitted the top bid. He is an Atherton resident and served as trustee in the Sequoia district from April 18, 1973 until July of this year. He urged the district to have a $10,000 land use study done of the site when trustees voted to sell the hilltop campus two years ago. The site was purchased in 1959 for $281,982 and the distraict added $139,688 in payments for improvements, making a total of $421,670. About 30 acres are in the city of Redwood City with the remainder in the Town of Woodside.

The Carpo-Harrington-Kulakoff bid was accompanied by a cash deposit of $112,000 for an option plan which includes modifications suggested by Mr. Harrington after he resigned from the board.

Trustee Jack Robertson raised this point and was told by Deputy Superintendent Dee Sanford that the district attorney had followed all procedures and been represented when the bids were open.

"The district attorney found no legal reason to disqualify the bids, and Mr. Harrington has no advantage over anyone else," Dr. Sanford said. He reported that his office had contacted 60 to 75 realtors and other persons who might have interest in bidding. There were five potential bidders when the envelopes were opened, and only two made firm bids. There were no oral bids as permitted by law at that time, he said.

Dr. Sanford said Redwood City has a general plan which calls for income producing development on the site, but the zoning now is for half acre residential lots. "It's complicated," he concluded. Trustee Ted Wellings said "It's in our interest to take a position to get the general plan changed so that the school district can maximize its income."

A spectator in the audience, there because of another agenda item on mountaineering, was Robert Norris, Redwood City councilman who lives in Redwood Shores.

The Sequoia district advertised for bids last summer and received two bids on July 20. One was from Mr. Carpo who bid $1,200,000, and the other from Dividend Industries, Inc., of Santa Clara for $1,250,000. Subsequently Duncan Matteson of Stanford Financial Company said he was prepared to bid $1,350,000.

On the basis that higher bids would be made on another try, and upon suggestions by Mr. Harrington that increasing options for bidders would up the sale price, trustees rejected the Dividend bid and readvertised the sale.

In the second bidding, Stanford Financial Company entered a joint bid with Eureka Financial Corporation for $1,375,000.

Mr. Harrington said he met Mr. Carpo after the initial bidding. It was then, he explained, that the two decided upon the joint venture for the second bidding.

Mr. Harrington said he envisioned a project of about $20 million that would be phased over five years. He said open space would be a prerequisite of his plan and that the serpentine area would not be disturbed.

"I've always thought this was a great piece of property," Mr. Harrington added. "I think a typical subdivision would miss the mark. I'd like to meet the general plans of Redwood City, the needs of Woodside and keep within financial parameters."

He said Carl Holvick, a contracting firm which specialized in commercial and office buildings, would be a part of the joint venture. Mr. Harrington listed several examples of the work the Holvick firm had done and named the office building in which Trustee Ted Wellings has his offices as a certified public accountant in Menlo Park.

Association with Mr. Holvick would bring expertise in commercial buildings since Mr. Harrington and his business partner, Alexander Kulakoff, have specialized in residential projects, Mr. Harrington said.

by Nita Spangler

MOUNT RITTER and Banner Peak are two of the highest mountains in Mammoth Lake region. Their jagged 13,000 foot tips rise dramatically to the west of the lower Mammoth Mountain. Photo by J. W. MacBride.

Nobel Prize winner

continued from page 1

and cosmology are the farthest frontiers of science and the farthest from practical application. Yet Dr. Richter sees value in them, "If you take a long range view, you can let history be your guide. We find that as man has understood more about the universe he has been able to do more about it," he said, pointing to the fluorescent lights in the ceiling. "Electricity was once very far out in basic research."

Dr. Richter likes to quote Sir Ernest Rutherford, who first discovered the nuclear nature of the atom early in this century.

Asked about the practical application of the nucleus, Rutherford said, "Anyone who believes that we shall get power from the atom is talking moonshine."

by Marion Softky

Impact of new PEP ring

The final Environmental Impact Statement for the Positron Electron Storage Ring at the Stanford Linear Accelerator Center is now available.

The half-inch document describes the environmental impact of building a circular tunnel 700 meters in diameter and six-to-30 meters underground at the east end of the present linear accelerator. Copies of the document and information on the project are available from Douglas Dupen at the accelerator, 854-3300.

The final version has been drastically rewritten from the draft document which was circulated to local agencies for comment last spring. It responds to many of the comments submitted and contains a 69-page appendix which includes all the comments submitted with specific replies to each.

The $78 million project, which is due to be completed in 1980 if funding and construction go according to schedule, will involve moving 320,000 cubic yards of dirt on the property. The tunnel will be primarily bored with no blasting, according to the report. It also discusses drainage, traffic, power and water, noise, construction and other impacts and the efforts to mitigate them.

According to Nobel-Prize winner Burton Richter, who is heading the project, it is in the final design stages. Actual construction on the site is expected to begin next spring.

Conservation gifts

The gift shop of the Peninsula Conservation Center, 1176 Emerson St., Palo Alto, is now open from 9 a.m. to 5 p.m., Weekdays with Saturday hours of 11 a.m. to 3 p.m., Nov. 20, Dec. 4, 11, and 20.

Gifts for sale include bird books, wildflower seeds, notepaper, Sierra Club books, calendars and posters. The Committee for Green Foothills Christmas cards and wrapping are also for sale.

Special events at the gift shop will include an appearance by Genny Schumacher Smith, editor of "Mammoth Lakes Sierra," from 3 to 5 p.m., Nov. 13. Mrs. Smith will autograph her books and refreshments will be served.

On Nov. 30 Sue Crane of Portola Valley will talk about her work methods and share tea and crumpets. Dr. Walter F. Dabberdt, local meteorologist and author of "The Whole Air Weather Guide," will be at the shop from 2 to 4 p.m., Dec. 9.

Doll sale

Stuffed animals, dolls, and toys will be featured in the annual doll sale to be held at the Bargain Box, 318 Cambridge Ave., Palo Alto beginning, Nov. 15.

Included will be some Steiff animals, Kiddles dolls, hand puppets a few English-made string puppets and foreign dolls for the collector, but mostly just lovable dolls and animals, according to chairman Mrs. Frank A Walsh.

The Bargain Box benefits the Childrens Health Council which offers diagnostic and treatment services to children with emotional, mental and learning disabilities.

Square dance

Woodside and Portola Valley residents are invited to join the Los Quadros Square Dance Club which meets on the second Saturday of each month in the Ladera School multi-use room with the next dance scheduled for 8 p.m., Nov. 13.

Activities for the year will include a dinner at the St. Francis Yacht Club, a family dance, summer barbecue and several potluck dinners and dances.

Those interested in joining may call Shirley Brandon at 854-5175 or Joan Gates at 851-1280.