BABAR Find New Massive Particle

By Heather Rock Woods

On Thursday, June 30, at the international Lepton-Photon symposium in Uppsala, Sweden, the BABAR collaboration announced the discovery of a new massive particle with curious behavior.

The particle is produced in collisions between electrons and their antimatter counterparts, called positrons. For the moment the particle has been named Y(4260), reflecting the measured mass of 4260 Mega-electron volts but the unknown nature of the state. The discovery is the subject of a paper recently submitted to Physical Review Letters.

See whole story...

KIPAC Launches New Public Website

By Jennifer Formichelli

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See whole story...

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By Monica Bobra

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called the Western Bluebird, the six homes were simply an initial trial “just to get an idea of bluebird activity,” said Kirk Stoddard (EPR). Now SLAC plays an active role in Western Bluebird preservation.

See whole story...

Summer Students Square the Circle at SLAC

By Francoise Chanut

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See whole story...

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http://www2.slac.stanford.edu/tip/2005/july15/ssi.htm
BABAR Finds New Massive Particle

By Heather Rock Woods

On Thursday, June 30, at the international Lepton-Photon symposium in Uppsala, Sweden, the BABAR collaboration announced the discovery of a new massive particle with curious behavior.

The particle is produced in collisions between electrons and their antimatter counterparts, called positrons. For the moment the particle has been named Y(4260), reflecting the measured mass of 4260 Mega-electron volts but the unknown nature of the state. The discovery is the subject of a paper recently submitted to Physical Review Letters.

“This is a very beautiful result,” said Persis Drell, Director of Particle and Particle Astrophysics. “The techniques used to extract the signal take full advantage of the enormous BABAR data set. We don’t yet know what this new discovery is telling us... but we know enough to be surprised. This isn’t what we expected!”

One unusual aspect of the discovery is the Y(4260) is seen in events where the annihilating electron-positron pair are accompanied by an energetic photon emitted before the collision, and nothing else. This allows BABAR physicists to establish the particle’s quantum numbers—which define a particle’s intrinsic properties such as spin and charge. However, they have yet to learn which combinations of quarks and gluons—the universe’s indivisible bricks and mortar—make up the particle.

The most likely scenario is that Y(4260) is part of a large family of particles, known as psi mesons. These are particles composed of a charm quark and an anti-charm quark tightly bound by the strong force. Although they have the same basic composition, psi mesons exist with different masses, in just the same way as an electron bound to a proton in a hydrogen atom can only have certain allowed energies according to quantum mechanics.

There are problems with this explanation. What intrigues the research team is the implied pattern of

A plot showing the resonance of Y(4260), the curious new massive particle whose discovery was recently announced by BABAR. (Image courtesy of BABAR)
Y(4260) decays into other particles. BABAR has only observed one set of decay products, a J/psi, pi+ and pi-. If this new particle is a type of psi meson—and it does have the same quantum numbers—it ought to decay much more often into particles containing a charm quark and a non-charm quark. Other measurements of total electron-positron annihilation rate suggest that this cannot be the case.

“We’re seeing hints that the particle doesn’t decay the way you would expect if it was part of the psi family,” said BABAR spokesman David MacFarlane. “It’s mysterious. Either we don’t understand the theory that explains how the strong force works in these bound states or the particle is more exotic than a simple charm anti-charm particle.”

The exotic possibilities include bound diquarks, particles with two quarks and two antiquarks, and hybrid mesons, particles with a quark, antiquark and bound gluon.

The discovery of the Y(4260) adds to the growing list of exotic new particles that have been seen in recent years at BABAR and Belle, the experiment at the KEK laboratory in Tsukuba, Japan. Some of these, such as the DSJ(2317) and DSJ(2458), refine our understanding of how quarks are bound into particles; others, such as the X(3872) and (3940) also defy conventional explanations and challenge our understanding of nature.

In addition to announcing Y(4260), the BABAR collaboration presented 65 papers at the Lepton-Photon symposium. The experiment is actively pursuing hints that matter-antimatter asymmetries in certain types of decays, called penguin modes, may be influenced by non-standard physics such as supersymmetry. This possible new symmetry of spacetime, where each of the presently known fundamental particles would be partnered by a very massive ‘superpartners.’ Existence of this or other new physics could impact penguin modes, which are particularly sensitive to the resulting effects. Two of the conference papers present data on two new types of penguin decays, one that follows standard physics and one that adds to the growing set of hints from BABAR and Belle that non-standard physics such as supersymmetry might be influencing these decays.

“We expect to double our data set by July 2006,” said MacFarlane, “which will possibly give us enough statistical significance to convincingly show that new physics is occurring in the penguin modes. It’s an exciting time.”

Some 600 scientists and engineers from 75 institutions in Canada, China, France, Germany, Italy, the Netherlands, Norway, Russia, Spain the United Kingdom and the United States are working on BABAR.
Breeding Bluebirds

By Monica Bobra

Since May 2004, miniature wooden houses have hung from various trees around the SLAC campus (see http://www2.slac.stanford.edu/tip/2004/may07/nest.htm).

Constructed to accommodate a dwindling species called the Western Bluebird, the six homes were simply an initial trial “just to get an idea of bluebird activity,” said Kirk Stoddard (EPR). Now SLAC plays an active role in Western Bluebird preservation.

Currently, there are six hundred Western Bluebird homes in San Mateo County, eleven of which hang on SLAC trees. Of these, five contain bluebird nests, while three lodge nests of other birds: the Bewick’s Wren, Chestnut-Backed Chickadee and Plain Titmouse. Both Stoddard and Juana Rudati (SSRL) monitor the homes weekly during the nesting season, which runs from February to July.

The 25-square-inch homes were supplied by Howard Rathlesberger of the California Bluebird Recovery Project, which is part of a nationwide effort to bring the bluebirds back to their natural habitat. The five-inch-tall birds build their nests in the cavities of rotting trees called snags. However, most construction workers uproot snags, unaware that they are an incredible resource—a whole ecosystem in itself, according to Stoddard. SLAC doesn’t uproot such trees, he reported, unless they present a safety hazard. The birds easily slip through the 1.5-inch diameter hole on the front panel of their home, specifically constructed to let in only the Western Bluebird.

However, more aggressive birds like the woodpecker have enlarged the holes and stolen the bluebirds’ homes. As a result, Stoddard replaced the woodpecker-damaged wooden boards with a metal plate pierced with a 1.5-inch diameter hole. Now the woodpeckers stay away.

A month ago, a member of the San Francisco Golden Gate Chapter of the North American Bluebird Society spotted a Western Bluebird in the former Presidio in the first recorded sighting of a San Francisco-residing bird since 1936, according to Rathlesberger. “The western bluebird kind of left the cities and now we’re getting them to come back,” he said, calling it a tremendous achievement.
Hundreds of county-wide bluebird organizations report to the North American Bluebird Society, pioneered by Lawrence Zeleny in March, 1978. Birdwatchers identify the Western Bluebird by its reddish breast, white belly, and bright blue wings and throat. The Western Bluebird, however, is not on the endangered species list. Why, then, are so many people devoted to preserving this small, friendly animal? “My guess would be the role that the bluebird plays in popular culture, which is an old, well established one,” said Mitch Snow, a spokesperson for the U.S. Fish and Wildlife Service. Rathlesberger has a different opinion: “Well, because the bluebird is really attractive,” he said. “You just fall in love with it.”

One of the reinforced birdhouses is suspended from an oak tree behind Bldg. 280C.

(Photo by Monica Bobra & Topher White)
Summer Student Square the Circle at SLAC

By Francoise Chanut

How many summer students does it take to coil 693 feet of RG220 coaxial cable neatly inside a square box? Five, according to John Krzaszczak (ESD).

He recently rounded up five summer students and four SLAC employees, who together loaded three cables totaling approximately 700 pounds into an 800 pound wood crate. The cables will be shipped to Japan later this summer.

It was not easy. On top of being heavy, the RG220 cable is stiff because it houses a copper wire a quarter of an inch thick. Moreover, it must not be twisted during handling, nor should it be coiled too tightly before shipping, because that would squeeze the wire and compromise its performance at high voltage.

The solution came in the form of an 8’x 8’ wood crate Krzaszczak and colleague Doug McCormick (ILC) designed specifically for this shipment—a case of “thinking inside the box,” Krzaszczak said.

“The crate has castors and we spun it around while removing the cable off the factory reel,” he explained. The result was a stack of three spirals with a comfortable curvature (at least a three-feet radius) inside the square crate—a snuggly squaring of the circle.

“It only took about an hour,” said Brian Domitilli (ESD), a UC Santa Cruz junior in legal studies who doesn't recoil from physical work.

The three 231-foot cables will provide the Pulse Forming Lines (PFL) of a kicker system that SLAC staff are installing on the damping ring at KEK in Japan. The kickers will move electrons in and out of the linear accelerators, sending them to the ring where they become focused into sharp beams. Kickers work in pulses whose duration depends on the PFL’s length. The KEK ring uses pulses of 300 nanoseconds, which requires a PFL of exactly 231 feet.
Krzaszczak and his student coordinator Tony Beukers (ESD), a UC Davis physics senior spending his fourth summer at SLAC, choreographed the packing. In keeping with the Integrated Safety Management System (ISMS), the team went through a safety evaluation before setting down to the task. Then, Domitilli hauled the cable off the reel while Sean Fong (ESD), a UCSC sophomore, and Neil Williams (ESD), a UCSC computer science student, stretched it out on the floor to measure it, and meted it out to someone standing in the crate. That person set the cable inside guiding grooves while the rest of the crew, including An Nguyen (ESD), a recent high-school graduate, rotated the crate. It took about ten full spins to coil each line inside the crate.

Once in Japan, the lines will remain coiled and will breathe electric pulses into the KEK kickers from the comfort of their wooden casing.
KIPAC Launches New Public Website

By Jennifer Formichelli

On Wednesday, July 6, the Kavli Institute for Particle Astrophysics and Cosmology (KIPAC) launched a new website.

KIPAC, an independent laboratory of Stanford University, is part of the newly-formed Particle & Particle Astrophysics science area of SLAC, and the new website is intended to showcase the research of KIPAC.

The first goal of the redesign was at once to fit the design of the KIPAC site into the SLAC family and visually representing KIPAC’s mutual affiliations with both SLAC and Stanford.

A news and events box was created on the left side of the page, in order to showcase events connected with KIPAC.

The center of the page was devoted to a revolving graphic which changes each time a user clicks on the page, and highlights both scientific images produced by KIPAC members, and artists’ renderings of the two new buildings KIPAC will eventually inhabit: the Fred Kavli Building at SLAC, and the Physics & Astrophysics building on campus. For further interactivity, webcams featuring the construction of both buildings are available underneath the News & Events box.

The navigation system was designed to have a similar feeling and structure to that on the SLAC homepage. It was also engineered to encompass a range of information specific to KIPAC, and to make that information immediately and easily accessible. Another menu was added for audiences within or affiliated to KIPAC.
The page also features a search box from which one can also launch a KIPAC search, or a SLAC web or people search. Links to SLAC and Stanford Physics Department on the bottom of the navigation menu highlight KIPAC’s unique dual affiliation.

The web page created thanks to Beck Reitmeyer, Ruth McDunn and Xeno Media.

Please feel free to send your comments to Jennifer Formichelli at jlf24@slac.stanford.edu.
The New Chemical Management System is Almost Here!

By Teresa Larson

A little over a month ago we updated you on the status of SLAC’s long-awaited chemical management system. We are now only four weeks away from full site-wide implementation!

There have been many accomplishments since our last update. One of these is the successful completion of the chemical move from SLAC Stores to the Haas hub in Gilroy. The transfer went without a hitch, and those chemicals previously stored on site can be ordered through the Haas on-line system (see link below).

Additionally, the number of workgroups ordering their chemicals through the on-line system has increased to 12, with another six to come on line within the next one to two weeks.

Cost savings have already been realized for several workgroups and many customers report that they are very pleased to have a full-time, on-site Haas resource to handle their orders and field issues quickly and efficiently.

Also, the Chemical Management System Team performed a full, on-site and off-site inventory of all SLAC-owned compressed gas cylinders. Site safety will continue to improve as unsafe cylinders identified during the inventory process are removed and/or replaced with newer, safer gas cylinders.

Two important milestones to report on:

1. **July 20 and 21**

CMS Project/Haas User Training will be held on site for those individuals with operator privileges in the Haas system.

2. **August 1**

The facility-wide go live date. Remember, everyone who initiates a chemical transaction on or after this date must use the Haas on-line system.

Again, thanks to all those who have helped make this project a success. If you have any questions or concerns, please contact one of the following divisional representatives:
Public Affairs & Tours Office Moved!
Welcome New Employees!
Milestones

EVENTS
Register Now for Kids Day @ SLAC!
Registration Ends July 22!

For more information, see the project web site at http://www-group.slac.stanford.edu/esh/cms/

The Stanford Linear Accelerator Center is managed by Stanford University for the US Department of Energy

Last update Friday July 15, 2005 by Topher White
Do You Have An E-mail Related Question?

Find The Answer on the New SLAC E-mail FAQs Site

We hope you’ll find the site helpful.

Here is an example of a few of the more commonly asked questions:

**Q:** Why can’t I send email through smtpserv anymore?

**A:** Many ISPs are starting to block SMTP traffic to anything but their own SMTP server. SBC/Yahoo did this a few months back. If you notice your outgoing emails not working this could be the reason. You will need to switch to your ISP’s SMTP server or try the SLAC Authenticated/Secure e-mail server. For more information see:  
http://www2.slac.stanford.edu/comp/messaging/faq/smtpfailure.htm

**Q:** How do I prevent certain e-mails from going into the SPAM Quarantine?

**A:** You can manage your own ‘whitelist’ and ‘blacklist’, view all e-mails in your quarantine and release e-mails from quarantine by using the PureMessage web server here at SLAC. You can find out how to do this on our PureMessage Quarantine web page at: 
http://www2.slac.stanford.edu/comp/messaging/Reference/spam-quarantine-explained.htm

For all the pages referenced above and a lot more, you can visit the SLAC E-mail web site at:  
http://www2.slac.stanford.edu/comp/messaging
Items Under Consideration for Deletion from Stores Inventory

After looking at the overall usage rates of certain Stores items, SLAC Stores plans to eliminate a number of items from its inventory. Many commercial vendors are now able to deliver commodities very quickly (‘just-in-time’ delivery) and, in many cases, this is a much more efficient and economical way to get what SLAC needs to do the job.

General and Metal Store Items

Any General and Metal Stores items that have not been issued since May 31, 2003 are slated for deletion.

Complete List of Other Items Scheduled for Deletion

A comprehensive list of many other items scheduled for deletion can be found on-line (http://www-group.slac.stanford.edu/pur/inactivestoresitems.xls). If you prefer, a hard copy of the listing is also available at the Stores service counter.

Is There an Item on the Deletion List You Would Like Retained?

SLAC Stores will need a justification to continue stocking any of the planned deletion items. If you still need Stores to maintain these items in stock, please e-mail your justification to: Tom Murphy at smurf@slac.stanford.edu no later than 1:00 p.m., Friday, July 29.

Contact:
Tom Murphy
Purchasing Department
Ext. 3582, smurf@slac.stanford.edu
New Safety Service Line

Need help with a safety issue or to get in touch with someone in the Chemical and General Safety (CGS) Department but do not know whom to contact? Then call the new Safety Service Line at Ext. 4554. You can also use this line to report environmental concerns or to ask environmental questions.

The Safety Service Line is for routine safety issues such as reporting unsafe conditions, chemical concerns, policy clarifications, hazard evaluations and minor incident reporting. For emergencies call 9-911, not Ext. 4554.

For anonymous reporting of unsafe events and/or compliance violations, use the ES&H Hotline (Ext. 4641).

We have implemented this new service as part of our ongoing effort to improve effectiveness, efficiency and customer satisfaction. The line is staffed with knowledgeable safety personnel from CGS who will either be able to address your concerns directly or obtain a solution from the appropriate subject matter expert.

All requests will be tracked to ensure that all issues have been adequately addressed.

If you call Ext. 4554 and nobody answers, leave a message and someone will be paged automatically. Please state if the matter requires immediate attention. Our goal is to respond to all calls as quickly as possible.

The Safety Service Line will be staffed from 8:00 a.m. to 5:00 p.m. Mondays through Fridays. Calls placed after hours will automatically roll over to Security.

For more information how to contact CGS or the ES&H Division in general, visit our web site at http://www-group.slac.stanford.edu/esh/
Computer Security for Home Users

By Teresa Downey

If you have DSL at home, you will need to be extra vigilant to keep your computer safe.

These are some basics you need to know:

- Use a firewall.
- Run anti-virus software and keep those definitions up to date.
- Keep your computer patched.
- Be smart about the way you use e-mail and the web.

There is a Web page that covers all these topics and more and we highly recommend you take a look at it. You can find a link for it on the SLAC Computer Security User Education page at:

http://www2.slac.stanford.edu/computing/security/education/

SLAC Computer Security sets aggressive patching deadlines for home and mobile Windows systems. The latest list of patches required can always be found here at: https://www-internal.slac.stanford.edu/comp/windows/security/slac_security_critical_issues.asp

If your home computer or laptop comes into the SLAC network via VPN, DHCP or Dial-up, it is required to have the latest critical patches applied. You could lose your ability to use these services until the system is up to date with all required patches.

Information on viruses, hoaxes, phishing, spam and more can be found on the SLAC Computer Security web pages. Please take a few minutes and browse the pages at:

http://www2.slac.stanford.edu/computing/security/

Contact: Teresa Downey
SLAC Post Master, Ext. 2903
teresadowney@slac.stanford.edu
Mark the Date!

Samuel Bodman
U.S. Secretary of Energy

will visit SLAC and Address the Staff on Thursday, August 4!

Additional information to follow.
The Public Affairs & Tours Office will be vacating its space next to the Central Lab lobby on July 14.

Come by and check out the new decor in room G111 in the Central Lab!

The Public Affairs phone number (Ext. 2204) will not change.
Welcome New Employees!

The new employee orientation held on July 7 included (left to right) Anthony Ban (PUR), John Choi (CEF), Frederick Jones (CEF), Paul Tomasi (MFD) and Gereon Meyer (ESRD).

(Photo by Erin Shatara)
**MILESTONES**

**Service Awards**

**5 Years**
Ivanov, Valentin (ACD), 7/24
Musselman, Reed (ESRD), 7/16
Zhou, Ken (SCS), 7/16

**10 Years**
Smith, James (EP), 7/17

**15 Years**
Ash, Teresa (PUR), 7/23
Gaillant, Eric (MFD), 7/23
Heifets, Samuel (ARDA), 7/23
Kruger, Karen (BSD), 7/17

**25 Years**
Zelinski, Joseph (KLY), 7/21

**35 Years**
Row, Georgia (TIS), 7/27

**Retirements**
Ferandin, Bette-Jane (DO), 6/30
Reif, Robert (EB), 6/18
Winick, Herman (SSRL), 6/15

To submit a Milestone, see: [http://www.slac.stanford.edu/pubs/tip/milestoneindex.html](http://www.slac.stanford.edu/pubs/tip/milestoneindex.html)

See Awards and Honors at: [http://www.slac.stanford.edu/slac/award/](http://www.slac.stanford.edu/slac/award/)

http://www2.slac.stanford.edu/tip/2005/july15/milestones.htm
Register Now for Kids Day @ SLAC!
Registration Ends July 22

By Teresa Troxel

Kids Day @ SLAC 2005 will be held on Wednesday, August 10. Registration will begin Monday, July 5, and will close on Friday, July 22. As in the past, SLAC employees and contractors may sponsor a 9-16 year-old child.

This year there will be 19 hands-on workshops for the kids to attend. These include electronics, mechanics, welding, rockets, magnetics, radiation, vacuum and paleontology to name a few.

There are four new workshops added to the choices: monster muscles, catapults, optics and electric motors. The workshops are grouped so that each kid attends different workshops in the morning and the afternoon. A kid would need to attend Kids Day for six years in order to attend all of the workshops!

There are additional safety considerations this year and each parent will be required to read about the risks involved in each workshop as well as to comply with required PPE (long pants and closed-toe shoes) for each kid.

The cost for the day is $12 and will cover a t-shirt, lunch and ice cream. This year’s t-shirt logo design winner is Jenine Fernandez, age 14. Her central figure is an inquisitive Albert Einstein—very timely for 2005, the ‘Year of Einstein’!

For additional Kids Day information, go to: http://www-
Public Affairs & Tours
Office Moved!

Welcome New Employees!

Milestones

EVENTS

Register Now for Kids Day @ SLAC!
Registration Ends July 22!

ABOUT TIP

Staff/Contact
Submission Guidelines

The Stanford Linear Accelerator Center is managed by Stanford University for the US Department of Energy

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The Interaction Point

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Send submissions to tip@slac.stanford.edu, or mail to TIP Editor, MS 58, Stanford Linear Accelerator Center, 2575 Sand Hill Road, Menlo Park, CA 94025.

TIP is available online at: http://www2.slac.stanford.edu/tip/