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SLAC * today

Thursday - August 17, 2006



Kids Day a Roaring Success

by Krista Zala

In conference rooms, on lawns, and across labs and shops, children fiddled with lenses and lasers, hunted for buried shark teeth and launched balls from trebuchets yesterday at SLAC's 5th Annual Kids Day.

"It was a good day," said event co-organizer Barry Webb. "We didn't lose anybody."

This year's event had 18 workshops led by SLAC employees. Divided into two age groups, the children took part in a wide variety of activities that included: cryogenics, biology, radiation, magnetics, welding, waves and astrophysics. Additional features of the day were an ice cream social and a science talk with KIPAC's Phil Marshall.

Chloe Zubieta welcomed all 254 participants with a discussion of how she came to be a scientist and her own impressions of the field. "The more time I spend in science the more I see how diverse it is," said Zubieta, a staff scientist with Joint Center for Structural Genomics at SSRL. Whether travel takes you to Brazil or to France, as a physicist or as a biologist, "we all share a fundamental curiosity of how things work," she said.

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BaBar Tames the Mischievous Penguin

by Andrei Gritsan



BaBar physicist Andrei Gritsan, from Johns Hopkins, explains penguins.

The BaBar collaboration is studying the phenomenon of "CP violation," Nature's preference of matter over antimatter in the universe. Physicists often illustrate this matter-antimatter asymmetry with the "[Unitarity Triangle](#)," a graphical representation of the fundamental processes that lead to CP violation. A precise determination of the three angles (α , β , γ) of this triangle is one of BABAR's primary goals. Until recently, most physicists assumed that the angle α would be measured in the simple decay of a B meson to two π mesons (pions).

However, quantum effects, so-called "penguin" processes, interfere with the direct measurement of α , particularly for this simple two π mode. BaBar needed a way to tame the mischievous penguins.

The breakthrough came three years ago when physicists on BaBar

Physicist Takes Third in Poker Tournament

by Krista Zala



Michael Binger
(Click on image for larger version.)

"Since middle school, I've always had plans to get rich," says Michael Binger, a theoretical particle physicist at the Stanford Linear Accelerator Center (SLAC). Last week, his dream came true. On Aug. 11, Binger placed third at the World Series of Poker Championships in Las Vegas and walked away with \$4,123,310.

"The championship included all the best players on Earth, and a lot of the worst players," Binger says. "It's about knowing how to weave your way through people and survive."

The no-limit Texas Hold'em tournament drew nearly 9,000 entrants, each of whom paid a \$10,000 "buy-in," which supplied the \$87 million later apportioned to the top 10 percent of players. Stakes were raised every 2 hours.

At the 36th level, Binger's last, the minimum bet was \$400,000. After another player folded, leading chip holder Jamie Gold drew a straight to

Events ([see all | submit](#))

- August 17: (10:00 a.m.) [SLUO Statistics Lecture: Density Estimation \(III\)](#)

Access ([see all](#))

- [LCLS Construction Surveyors](#)
- [A&E ADA Restroom Renovation](#)
- [Bulb and Ballast Replacement in Bldg. 84 and 40](#)
- [Road Closure - Access to B062 \(End Station B\) Parking](#)

Announcements ([see all | submit](#))

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Community Bulletin Board

- [San Francisco Jug Band Festival](#)
- [SF Opera in Golden Gate Park \(Sun. Sept. 10th 1:30pm\)](#)

discovered the B decay to two charged ρ mesons, which are heavier cousins of the pion. The experimenters cleverly exploited a quantum feature of the ρ meson, its spin angular momentum, to help distinguish this rare (1 in 50,000) $\rho\rho$ decay from the much larger pion background.

But studying this decay was only one step in measuring α . The physicists knew they needed to find the analogous decay to two neutral ρ mesons, the $\rho^0\rho^0$ decay. This one-in-a-million decay is dominated by the penguin mechanism. The initial results from earlier BaBar data showed that the $\rho^0\rho^0$ decay was about 20 times less likely than the $\rho^+\rho^-$ decay and indicated much smaller "penguin pollution" in the $\rho\rho$ measurement of α than in the two-pion decay.

However, $\rho^0\rho^0$ was still a missing piece of the puzzle and BaBar was determined to find it. In the last year, the excellent delivered luminosity of the PEP-II collider promised to provide more than 100 million additional B-meson decays that would be needed to see the $\rho^0\rho^0$ decay. It was actually a surprise when, after many months of preparation, the experimenters "opened the box" and discovered a large signal that exceeded expectations. In statistical language, the probability that they found $\rho^0\rho^0$ is more than 99.9%.

The surprise sighting of $\rho^0\rho^0$ indicates that the penguins cannot be ignored in the measurement of α . Now the analysts at BaBar have another clever trick up their sleeves. The neutral ρ meson itself decays into two charged pions, and this

beat Binger's pair of tens, landing the SLAC physicist third place.

A longtime card player, Binger recalls a year-long surreptitious game of seven-card stud in his high school sophomore chemistry class. He moved from blackjack to poker in 2001, when a friend invited him to a poker table in San Francisco.

After winning a thousand dollars on a good day at Lucky Chances south of San Francisco, he tried a table with higher stakes. "I stepped into that and got killed," he says. "I realized there was more to the game than I'd known." Binger studied books on poker with the goal of winning back the ten thousand dollars he had lost, and did so within months.

"Blackjack is entirely solvable, but poker always involves adjusting to the precise environment," Binger says. That environment includes the vagaries of opponents' psychology—as well as luck.

"That's the difference between poker and golf," Binger says. "Nobody is ever going to beat Tiger Woods. In poker, luck does dominate in the short run, but usually the better players win in the long run."

Over the last five years, Binger has spliced forays into poker with earning a doctorate in theoretical particle physics from Stanford. Rewards in the two pursuits have coincided: He received his doctorate two months ago. But beyond skills in probability and statistics, Binger says "there's very little direct overlap" between his training in physics and his poker feats.

Binger still plans to work on his research at SLAC, competing in the poker tournament circuit about once

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- [Marc Ross's Farewell Party](#)
- [Reminder: Bike Safety](#)

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unique feature of the qq system will a month. Otherwise, he says he will allow BaBar to disentangle quantum keep financial plans modest—unless effect ambiguities. It seems the he's bluffing. penguins are our friends after all.



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