Schwarz Outlines Past, Future Of Superstring Theory Development

By MARK POLINKOVSKY

On the evening of Wednesday, February 11, 2004, Professor John Schwarz addressed a packed Beckman Auditorium in his Wason Lecture Series on string theory. Dr. Schwarz, the Harold Brown Professor of Theoretical Physics at Caltech, fittingly titled his lecture ‘String Theory: Past, Present and Future.’ In the lecture, he outlined the development of string theory and then continued on to describe problems that the theory has yet to overcome. In his introduction, Professor Tombrello described some of the honors that Professor Schwarz has received. He also emphasized the important work Dr. Schwarz has done. Professor Schwarz divided his lectures into three periods in the development of string theory. The first period, ‘The Past’ stretched from 1968 to 1993, ‘The Present’ continued from 1994 to 2004 and ‘The Future’ addressed the major problems still remaining.

String theory was first devised to explain the strong nuclear force. Originally proposed in 1968, it quickly became an area of very active research. Soon, however, quantum chromo-dynamics (QCD) was developed for the same reason. It was more successful at explaining the strong force and string theory was abandoned by the majority of theoretical physicists. Several problems made string theory unpopular at the time. It involved 26 dimensions, did not describe protons and neutrons and gave massless particles when the ones in question should have mass.

Yet, there was a breakthrough. In 1960, string theory was abandoned. String theory made string theory unpopular at the time. It involved 26 dimensions, did not describe protons and neutrons and gave massless particles when the ones in question should have mass.

Monologues Entertain, Raise Women’s Issues

By ROYAL REINECKE

With a name like The Virginia Monologues, Friday night’s sold-out production in Baxter Lecture Hall promised a provocative and evocative performance, certainly not a show to skirt the issues—and it definitely delivered on that promise. In awe of the show’s direct, frank and confrontational treatment of women’s issues, one anonymous male audience member ironically exclaimed, “That takes balls!”

Friday the 13th of February

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Health Survey to Hitting Inboxes Today; Curtis Targets Base Data

By KAYTE FISCHER

Today, Tuesday, February 17th, the first comprehensive health survey ever conducted on Caltech campus will be emailed to graduate and undergraduate students. The email will include a unique link for each student, sending them to the American College Health Association’s (ACHA) confidential, web-based survey. The topics on the survey range from bike helmet use to oral sex habits.

According to Jane Curtis, Baxter Lecture Hall Bristol, the intent of the survey is to get baseline data on a broad spectrum of student health behaviors and then to create programs based on the identified needs.

Says Curtis, “Evidence based and data-driven programs are always far more effective. We must ask, ‘What are the needs of this campus?’ And it’s up to the students to give accurate honest data.”

Caltech enters the four year old survey as the 180th college campus, in the company of a large variety of two and four year institutions. Schools such as USC and Penn State have had excellent results with the programs created because of this survey. This is the first term for the web-based survey to appear; Curtis believes that many more schools will take the survey, increasing the number involved to well above the current 106,096 students. Health educators across the country are collaborating to assess the general health status of the college community.

Curtis elaborates, ‘This survey is the most comprehensive instrument available for college campuses.’

The main benefit of this survey will be the variety of Caltech-specific programs it will generate.

Voter Figures Indicate Confidence in ASCIT

By KEVIN BARTZ

In a departure from the last year’s record-setting turnout, low vote totals signalled broad contentedness as a crew of familiar faces swept ASCIT balloting last Monday in what was widely seen as a vote of confidence for the outgoing board of directors.

“We have lower voter turnout,” said outgoing President Tom Fletcher ’04. “People are less angry. They are pleased with what has been done.”

Not that one not tried to shake up the system this year. Outsidr after outsider bit the dust last week, from those in more prominent positions like the race for Academics and Research Committee chair to those for more localized positions like treasurer.

In particular, the hotly contest­ed HIC chair election emerged as the focal point of this year’s slate of contests. ARC representative Kim Popendorf ’06 came out on top of a disparate field of candi­dates promising everything from freshmen in Avery House and more frequent ‘Mudoo’ gaming shows to a return of Dean of Stu­dents Jean-Paul Revel’s no-show-de­fect weekly commentary.

None received more than 21% of first-place votes, but after eight tense redistributions Popendorf edged out Roshlock icon Michael Pricio ’05 by a mere 14 votes, barely enough to overcome ASCIT’s margin of error. Popendorf followed by five others in the mar­kedly divided seven-way race.

Still, even the runners-up ac­knowledged that the battle was a decisive victory for Popendorf, the first sophomore elected to the position in 12 years.

“Kim has a lot of friends be­cause she’s a really nice per­son, and with the support of her friends, I’m sure she’ll do a fine job as HIC chair,” said fourth­place finisher Chris George ’06. Dual Blacker and resident Andrea Kung ’05, who placed sixth, echoed, “I believe that Kim will do her best to serve as a liaison between the students and the administration,” she said.

‘She cares deeply for the student...
With Few Exceptions, Returning Veterans Dominate Challengers

Continued from Page 1, Column 5

In ASCIT's complex preferential voting system only one choice was required. No candidate accused more first-place votes than Tiwari, but Tiwari's 55% share was far above the 38% of second- and third-choice votes that ASCIT officials redistributed losers' ballots. Priolo, for instance, started off with 22% but catalyzed past the eighth round on the assumption that his second-choice ballots would have enough to double his total. Tiwari inched from 84 to 98. It was an almost eerie replay of last year's IHC chair race, which saw Neda Afsharmanesh '04 fall to Jennifer Lin '04 in a run-off election despite receiving considerably more support.

Disputes like this typically arise when a candidate presents a position that conflicts with a previous one. Tiwari, an ASCIT unknown who campaigned hard on a bid to consider the Avery option for freshmen. He also pressed heavily for off-campus residence halls as a hodgepodge of perceived ASCIT failures.

While he congratulated Popendorf, said Tiwari, "I am expressing reservation on her willingness to reach out to those out of the main stream on campus houses. To be fair, I will not make any judgements before I have heard her "social abilities," said Tiwari. "However, I am deeply concerned by her campaign. ASCIT must reach out to those whom the IHC has left behind."

Fletcher saw the result as the byproduct of a "touchy issue" regarding ASCIT. "Tiwari ran for first in first-place votes," explained Fletcher. "But picked up only 1% second-place votes. I think we're seeing that there was a strong vote of 'not Neil.'"

The senior class co-presidential election was won by Andrea Vasconcellos '05 and Tammy Ma '05, who ran a winning campaign theme of "survive while we're temporarily displaced," she said. Runner-up Priolo who declined comment, had crafted a similar platform.

"This was a triumph of determination. Hartman's win will provide an example of what can be accomplished with a hodgepodge of perceived ASCIT failures," said Tiwari. "However, what she sees as many students' lack of confidence in students and administration." Despite his loss, which he himself expected, Harris was equally pleased with Fisher's win. "She is probably more qualified for that job than I am," he conceded: "I think she will do a good job."

In ASCIT's shrouded world of discipline, the public ratified incoming Board of Control Secretary J.J. Hsu's statement broadcasted last week's round filled out the remainder of the BoD and ASCIT's academic positions. "There's new blood moving through," said Fletcher. "We've elected a good mix of freshmen."

Fletcher promised to continue their tradition of dedication to the paper. "You'd be hard-pressed to find two people as passionate about the paper as we did," they wrote.

Meanwhile, Lee pledged to use his CoRJ experience to shape delinquent editors into deadline-compliant editors. "Working as an executive editor for the past three issues of CoRJ has given me a lot of experience in dealing with student publications and organizing a staff of editors who don't always want to work," he explained.

All three are poised to face their roles with considerable relevant experience, mirroring a larger trend in this year's election.

In ASCIT's heavily contested weeks of elections which earlier placed Galen Lorum '05 at the BoD's helm and later affirmed Ann Bolgas '06, last week's round filled out the remainder of the BoD and ASCIT's academic positions. "There's new blood moving through," said Fletcher. "We've elected a good mix of freshmen."
Gay marriage arouses controversy from coast to coast

Massachusetts Supreme Court ruling spurs debate on the sanctity of marriage, equality

By PARAG BHANANI

On February 4, the issue of gay marriage was thrust into the national spotlight as never before after a Massachusetts Supreme Court ruling declaring that nothing short of allowing homosexuals to marry is constitutional.

The court reaffirmed the concept put forth by the Supreme Court in the 1954 Brown v. Board of Education ruling, that separate is inherently unequal under the authority of the Constitution. Therefore, gay people must be allowed to marry and enjoy all of the same rights and privileges that heterosexual people have, such as being an insurance beneficiary for a spouse and having hospital visitation rights. Marriage is necessary because terms like “life partners” and “civil unions” delegate gay and lesbian citizens to second-class status. This recent decision reinforced a November, 2003, ruling that struck the head of the Alliance for Marriage, proclaimed that, “we cannot thrive if we continue to see the disintegration of the family unit. Gay marriage opponents say that families necessarily must have one father and one mother. However, this precise combination is not needed in order to ensure a family that is successful in raising children.

Indeed, millions of children right now are being raised by homosexual couples without an epidemic of corruption of young ones. Another conservative commentator, Maggie Gallagher, claims that children are left to adjust to “alternative” families with two same-sex parents or a father who has left the mother. Therefore, families with two gay parents or just a mother are equivalent in comparison to a mother and father family. Her idea is that “alternative” families where a father has left may teach a boy to do the same when he grows up, thereby continuing a trend of single-parent homes.

What Gallagher fails to realize is that marriage, both parents are present. Therefore, the son would not pick up such ideas that is acceptable to leave the family as a grown man. The child instead will see that two responsible parents, whether or not they are the same gender, is beneficial to the upbringing of the family unit. Additionally, the anti-gay wedding Family Research Council issued a press release on Friday condemning the actions of Newt Gingrich and Henry Hyde-the main proponents of the Clinton impeachment) are guilty of infidelity. We also hear stories every day of men beating their wives, and occasionally, of women beating their husbands. The recent performance of The Vagina Monologues was, in fact, to help the plight of battered women.

Considering all of this, we must keep in mind that significance of marriage is not that it is reserved for one man and one woman, but that the two people who enter into this bond remain devoted to each other for the rest of their lives. As conservative scholar David Brooks writes, “Gay marriage critics say] it is women who domesticate men and make marriage work... In truth, it is moral commitment, renewed every day through faithfulness, that dominates all.”

I will close with the words of Sullivan, who feels that while one may disapprove of homosexuality, be it for religious or other reasons, “disapproval needn’t mean disrespect. And if the love of two people, committing themselves to each other exclusively for the rest of their lives, is not worthy of respect, then what is it?”

Mike Kahler, left, puts a ring on partner on finger of Kevin Fox, both of Oakland, CA. Other marriages take place in the background.
Sports Week: Tennis, Love, Baseball Posts Losses

By MIKE RUPP
February 9, 2004

Athlete of the Week
Kristen Zortman:
Women's Track & Field
The Junior from Stevens Port, Wisconsin, in only her first full season playing Track & Field, gave Caltech something to cheer about at the 2004 Caltech All-Comers Track and Field meet this past weekend. Zortman threw a personal best in the Women's Javelin competition. Zortman also posted an impressive 14.66 Time in the Women's Meter dash. A three-sport athlete at Caltech, Zortman is also a major contributor for the Women's Volleyball team, and played Baseball her first two seasons at the Institute.

Week in Review

Men's Basketball (0-18)
Head Coach: Roy Dow
The Men's basketball team continued to slowly narrow the gap this past week. Junior Forward Jeffrey Lamb was the high scorer for the week, scoring 19 points for a 9.5 average. Sophomore Guard Day Boyd accounted for Caltech's sole run with the first home run of his collegiate career. The second game was lost 10-7 despite home runs by Sophomore Tim Boyd and Sophomore Shortstop David McKean. The team plays next this Saturday.

Women's Basketball
Caltech.................. 20
LA VERNE.............. 59
CAL LUTHERAN.......... 82
CALTECH................ 13

Women's Basketball
Caltech................. 20
LA VERNE.............. 59
CAL LUTHERAN.......... 82
CALTECH................ 13

Women's Swimming/Diving
Caltech................ 79
OCCIDENTAL........... 133

Women's Swimming/Diving
Caltech................ 79
OCCIDENTAL........... 133

Caltech Track and Field
The Men's and Women's Tennis teams both split their weekend matches, each sweeping La Sierra University on Sunday after being swept themselves by Redlands on Saturday. Highlighting Sunday's performances, Freshman Philipp Perpelitsky led the Men, winning both at #2 singles 6-0, 6-0, and then touring with last week's Caltech Athlete of the week John Howard to win at #1 doubles, 8-0. Sophomore Jenny Husio had one of the best weekends for the women, going 6-0, 6-0 at #4 singles before teaming with Sophomore Mariana Nomanbhoy to win 8-3 at #1 doubles. Tennis plays this Tuesday at home against Biola.

Baseball
Head Coach: John D'Auria
The Men's Baseball team lost both games of their double-header to Simpson College this past Saturday. Junior Isaac Gremmer pitched an outstanding 7 innings in the first game, giving up only two earned runs in a 5-1 loss. Sophomore Tim Boyd accounted for Caltech's sole run with the first home run of his collegiate career. The second game was lost 10-7 despite home runs by both Gremmer and Senior Shortstop David McKean. The team plays next this Saturday.

Track & Field
Head Coach: Julie Levesque
The Men's Baseball team lost both games of their double-header to Simpson College this past Saturday. Junior Isaac Gremmer pitched an outstanding 7 innings in the first game, giving up only two earned runs in a 5-1 loss. Sophomore Tim Boyd accounted for Caltech's sole run with the first home run of his collegiate career. The second game was lost 10-7 despite home runs by both Gremmer and Senior Shortstop David McKean. The team plays next this Saturday.
In order to prepare for self-defense, one needs to learn about the various techniques and strategies involved in self-defense. Participating in a self-defense course can help individuals develop the skills and knowledge necessary to protect themselves in dangerous situations.

The Beckman Political Internship will be available again this summer. The internship, supported by friends of Arnold O. Beckman, will pay a stipend of $5,000. It allows a selected intern to spend the summer working in the office of a politician or a government agency and to see from the inside the process of government. The applicant is expected to make arrangements with the appropriate political persons or organizations.

The first 2003-2004 Everhart Lecture, "Cancerous Stem Cells: Insight into the Origins of Human Brain Tumors," will be given by Professor David E. Relander, a Caltech-UCLA-MD-PhD student in biology.

A start-up in the technology industry is looking for someone who wants to make extra money. They are seeking to hire a technical consultant to help other companies develop new products. The consultant will be responsible for providing technical advice and guidance to clients, helping them to develop innovative solutions to complex problems. The ideal candidate will have a background in computer science or a related field and will be comfortable working with a variety of technologies.

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For more information on the available positions, please contact: Lincoln Laboratory, Attn: Human Resources, 244 Lincoln Street, Lexington, MA 02421.
Production Succeeds In Spite of Naysayers

In the third week of January and required minimal time commitment from the actors, roughly six to eight total rehearsals, each woman was invited to attend a couple of them. The main purpose of practices was to help women get to know each other and speak with the script so that they would be comfortable on stage. During these rehearsals, the actors also had the opportunity to share their experiences with one another, which was a powerful moment for some. The Vagina Monologues provide a unique platform for women to connect with each other and share their stories in a safe and supportive environment.

The reading began by focusing on the lack of open discussion regarding vaginas. In an insightful analogy, the character exposes the reality of how “There’s so much darkness and secrecy around it. It’s like the Bermuda Triangle—no one goes there!” The speaker introduces the concept of “our vaginas,” and emphasizes the need for open dialogue about these issues.

The reading concluded with the most powerful moment of the evening, when the audience was called upon to stand and applaud. The ovation was thunderous, and the atmosphere was charged with emotion and energy. The actors were visibly moved by the response of the audience, and the experience was one of the highlights of the evening.

As the night came to a close, the audience was left with a sense of empowerment and solidarity. The Vagina Monologues have become an important tool in the fight for women’s rights and in the continued conversation about the importance of open dialogue on issues of gender equality and sexual health. The production at Caltech was a testament to the power of art to bring people together and inspire change.

The audience was moved, and many felt a sense of empowerment and a desire to stand up and fight for their rights. The Vagina Monologues are an important tool in the fight for gender equality, and the production at Caltech was a powerful example of their impact.
Survey Questions To Cover Several Topics

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Collider to Confirm Superstring Theory

Continued from Page 1, Column 3

in 1971, when Pierre Ramond Andre Neveu and Dr. Schwarz developed an improved string theory, which included fermions (protons and neutrons). Also surprising, one of the massless particles had the same characteristics as the graviton, the carrier of the gravitational force. In 1974, Joel Scherk and John Schwarz proposed string theory as a candidate for unifying the four fundamental forces. String theory had two benefits over more traditional "point-particle" theories. Stringy fluxes resulted in conventional theories would yield infinities. Further, most of the dimensions would curl up and become unobservable, making the theory more consistent with observations. Still, most physicists remained uninterested.

Soon after, Dr. Schwarz began collaborating with Michael Green. Together, they developed supergravity theory. The biggest surprise came in 1984, when they showed that supergravity theory free of anomalies in several cases. Soon, computing became a science in itself. Adv. Yet, through space and strength dualities, the field was reduced to just two dimensions.

Soon, many advances were made in superstring theory. The most important problem was to describe the behavior of strings under high gravitational forces. Ed Witten and others showed in 1994 that an 11th dimension becomes important at high "g." It was also hypothesized that all free superstring theories were just different manifestations of a single, higher-order theory, called M-theory.

Soon after, "branes" were introduced. A group of cells, called D-branes held the endpoints of strings and it has been shown that open strings end on them but closed strings, with all points joined, don't.

Despite the many recent advances, Dr. Schwarz emphasized that a lot of work remains. People's understanding of the subject is fragmented and fundamental principles may be missing from different versions of the theory. The solution which best describes particle physics still needs to be formulated. Several vital questions need to be answered. The exact role of supersymmetry in elementary particle physics needs to be determined and dark matter must be explained.

Fortunately, the Large Hadron Collider being built in Geneva, Switzerland promises to confirm significant aspects of the theory. It will be able to create particle collissions with enough energy to form super symmetry partner particles. Studying their properties will help to develop the theory further. Professor Schwarz ended by saying that: "We are able to develop new mathematical tools and concepts to solve these problems. Supersymmetry theory leads the key to many unanswered questions and advancing it will likely increase humanity's understanding of the Universe."