



TERRAscope program continues earthquake research

CYNTHIA ELLER
Caltech Today

Since the magnitude 6.7 Northridge earthquake 20 years ago (January 17, 1994), researchers at the California Institute of Technology (Caltech) have learned much more about where earthquakes are likely to happen, and how danger to human life and damage to property might be mitigated when they do occur.

“The Northridge quake really heralded the beginning of a new era in earthquake research, not only in southern California, but worldwide,” says Michael Gurnis, John E. and Hazel S. Smits Professor of Geophysics, and director of the Seismological Laboratory at Caltech.

In the years just prior to the Northridge earthquake, Caltech launched a program called TERRAscope supported by the Whittier foundations, which placed high-quality seismic sensors near where earthquakes occur. The Northridge earthquake was, in effect, the first test of TERRAscope in which Caltech scientists could infer the distribution of an earthquake rupture on subsurface faults and directly measure the associated motion of the ground with greater accuracy. “With a modern digital seismic network, the potential of measuring ground shaking in real time presented itself,” says Gurnis. “The real time view also gave first responders

detailed maps of ground shaking so that they could respond to those in need immediately after a quake,” adds Egill Hauksson, senior research associate at Caltech.

To give us this new view of earthquakes, Caltech collaborated with the U.S. Geological Survey (USGS) and the California Geological Survey to form TriNet, through which a vastly expanded network of instrumentation was put in place across southern California. Concurrently, a new network of continuously operated GPS stations was permanently deployed by a group of geophysicists under the auspices of the Southern California Earthquake Center, funded by the USGS, NASA, NSF, and the Keck Foundation. GPS data are used to measure displacements as small as 1 millimeter per year between stations at any two locations, making it possible to track motions during, between, and after earthquakes. Similar and even larger networks of seismometers and GPS sensors have now been deployed across the United States, especially EarthScope, supported by the NSF, and in countries around the world by various respective national agencies like the networks deployed by the Japanese government.

Initially, says Gurnis, there were not many large earthquakes to track with the new dense network of broadband seismic instruments and

GPS devices. That all changed in December 2004 with the magnitude 9.3 earthquake and resulting tsunami that struck the Indian Ocean off the west coast of Sumatra, Indonesia. Quite abruptly, Caltech scientists had an enormous amount of information coming in from

of geophysics Mark Simons using data from GPS systems installed by the Japanese had produced extensive measurements of ground motion, as well as earthquake models constrained by this data, that provided new insight into the mechanics of plate tectonics and fault ruptures.

The Tohoku-Oki earthquake was unprecedented: scientists estimate that over 50 meters of slip on the subsurface fault occurred during the devastating earthquake. Currently, scientists at Caltech and the Jet Propulsion Laboratory are prototyping new automated systems for exploiting the wealth of GPS and satellite imaging data to rapidly provide disaster assessment and situational awareness as events occur around the globe. “We are now at a juncture in time where new observational capabilities and available computational power will allow us to provide unprecedented speed and resolution,” says



-<http://www.fema.gov>

the instrumentation in Indonesia previously deployed by the Caltech Techtonics Observatory with support from the Gordon and Betty Moore Foundation. By the time the magnitude 9.0 Tohoku-Oki earthquake hit northern Japan in 2011, the Seismological Laboratory at Caltech had developed greatly expanded computing power capable of ingesting massive amounts of seismic and geodetic data. Within weeks of the disaster, a team led by Caltech professor

Simons. Earthquakes are notable—and, for many, particularly upsetting—because they have always come without warning. Earthquakes do in fact happen quickly and unpredictably, but not so much so that early-warning systems are impossible. In a Moore Foundation-supported collaboration with UC Berkeley, the University of Washington, and the USGS, Caltech is developing a prototype early-warning system that may provide seconds to tens

of seconds of warning to people in areas about to experience ground shaking, and minutes of warning to people potentially in the path of a tsunami. Japan invested heavily in an earthquake early-warning system after the magnitude 6.9 Kobe earthquake that occurred January 17, 1995, on the one-year anniversary of the Northridge earthquake, and the system performed well during the Tohoku-Oki earthquake. “It was a major scientific and technological accomplishment,” says Gurnis. “High-speed rail trains slowed and stopped as earthquake warnings came in, and there were no derailments as a result of the quake.”

Closer to home, Caltech professor of geophysics Robert Clayton has aided local earthquake detection by distributing wallet-sized seismometers to residents of the greater Pasadena area to keep in their homes. The seismometers are attached to a USB drive on each resident’s computer, which is to remain on at all times.

The data from these seismometers serve two functions: they record seismic activity on a detailed block-by-block scale, and, in the event of a large earthquake, they can help identify areas that are hardest hit. One lesson learned in the Northridge earthquake was that serious damage can occur far from the epicenter of an earthquake.

The presence of many seismometers could help first responders to find the worst-affected areas more quickly after an earthquake strikes.

Caltech scientists have also been playing a leading role in the large multi-institutional Salton Seismic Imaging Project.

Continued on page 3

In this issue

NEWS

New events from the Caltech Year

3

FEATURE

Style tips for the career fair

4

FEATURE

Nailen reviews The Crystal Method

5

SPORTS

Caltech gets new volleyball coach

7

News briefs from around the globe

Helping readers burst out of the Caltech bubble

Need to know

< **100** words about the world this week – topics sorted from good to bad

by *The Tech Eds*

Iran agrees to new deal	5% purity, not 20%, for Uranium enrichment agreed to be new limit [CNN]
US reduces caloric intake	118 -calorie average decrease in consumption reported by USDA [TIME]
Colby arsonists caught	3 individuals arrested for starting fire that has burned 1900+ acres [LAT]
Venezuela to raise prices	56% inflation leads president to plan decrease in govt. subsidies [NYT]
Famous conductor dies	80 -year-old Claudio Abbado (La Scala, Vienna Philharmonic, etc.) died [NYT]
Taliban attacks again	22 killed, civilians & military, in attack on Pakistani army checkpoint [CNN]
Sochi Games threatened	22 -year-old suspected suicide bomber may have slipped by security [ABC]

Food with Mannion!

*Do you like eating food?
How about free food at nice restaurants?
Ever want to tell the world exactly what you think of said food?
The Tech will be beginning a new column to chronicle the foodie experiences of new writers every other week... The Catch: They'll be going head-to-head with Tom Mannion who will be reviewing the same restaurant. If you have ever thought you were more of a gourmand than our resident master chef, now's your chance to prove it!
Email us for a spot on the list at tech@caltech.edu*

The California Tech

Caltech 40-58, Pasadena, CA 91125
advertising e-mail: business@caltech.edu
editorial e-mail: tech@caltech.edu

Editors-in-Chief
Jonathan Schor
Stanford Schor

News Editors
Neera Shah
Nehaly Shah

Photography Editor
Alex Hsu

Staff
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Nailen Matschke
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The Tech is published weekly except during vacation and examination periods by the Associated Students of the California Institute of Technology, Inc. The opinions expressed herein are strictly those of the authors and advertisers.

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ASCIT Minutes*

*(Still no new minutes)

Minutes for November 19, 2013. Taken by Catherine Jamshidi

Officers Present: Zach Rivkin, Connor Coley, Malvika Verma, Connie Hsueh, Michelle Tang, Catherine Jamshidi

Guests: Connor Rosen, Margaret Lee

Call to Order: 9:05pm

President's Report (Zach):

- In my candidacy statement from April, I advocated for student leadership to take a level headed approach with the administration and focus on increasing student mental health resources. The process has usually been successful, and the most recent and largest accomplishment is an evening hours pilot program. After half a year of civil discussions with Kevin Austin, Leslie Nye, Tom Mannion, Anneila Sargent, John Dabiri, plus many other invaluable participants, along with a recent hardline passionate Faculty Board presentation, a limited evening hours trial will go into effect until the end of this academic year. This is an incredible step forward for the Caltech safety net and auspiciously points towards a positive shift in relations between students and student affairs. I hope to see further improvements during the next half of ASCIT's term and in the years ahead. Significant thanks goes to those mentioned above along with the student leadership, the Head UCCs, and especially to the IHC Chair Connor Coley for spending an innumerable number of hours and offering constant support through the entire process.
- Club funding has been completed.
- The ASCIT retreat and midyear reviews occurred. Survey responses were very helpful for framing discussions and supplying appropriate feedback.

Officer's Reports:

- **V.P. of Academic Affairs (ARC Chair: Malvika):**
 - Meeting with Provost Online Education Committee
 - Flipped classroom vs. online courses
 - Faculty don't want to dumb down standards
 - Concrete proposal: CS0
 - The second Student-Faculty Lunch was this past Thursday. We have continued to see a large amount of interest in this program from both students and faculty.
 - The ARC is interested in adding a compliments section to the ARC Concern Box on Donut.
- **V.P. of Non-Academic Affairs (IHC Chair: Connor):**
 - The IHC is working with Jon Webster and Dining to enter nutrition information of food options. If you're interested in helping us with data entry (for some money), send me an email. We'll likely begin around winter break.
 - Invite your professors to your house dinner! It's a great way to get to know them in a non-academic context.
- **Director of Operations (Connie):**
 - Remember that you can still register a new club anytime! Apply at clubs.caltech.edu
- **Treasurer (Monica):**
 - We finished Club Funding and I will be publishing the breakdown of the 2013-2014 budget on Donut.
- **Social Director (Michelle):**
 - The Ice House comedy show event will likely be made a termly event.
 - Page Interhouse: Daft Punk was this past weekend.
 - The Wallpaper. concert will be Friday, December 6th, at 9PM on Bechtel Mall (just west of Millikan).
 - There will probably be an after-party (details to follow) with a Snap Yourself! Photo booth.
- **Secretary (Cat):**
 - Connor Rosen and I have created a follow-up survey to gauge trends in feedback on the student experience. It should take no more than 5 minutes to complete and there will be several Amazon Gift Cards awarded to randomly selected people who responded to the survey. Go fill it out!!
 - I sent out all of the club funding decision emails and tried to provide reasoning for our decisions. If any clubs have any questions, please do not hesitate to ask!
 - I'm working to schedule ASCIT meetings for 2nd term.
 - I've posted all of the recent minutes on the Donut Website and have compiled a list of action items to follow-up on for each BoD member.

If anyone has any questions or concerns about a section of the minutes please email the appropriate officer. We are happy to answer any questions.

Meeting Adjourned: 10:53 pm

Caltech Y Column: Look out for new events

**PHOEBE ANN
LAURA SANTOSO**
Contributing Writers

Hi everyone! This is the Caltech Y Column, designed to inform you about the Y and the opportunities we provide for you to inspire your passions, whether by participating in our programs or leading your own!

Founded by students in 1916, the Y was organized to provide extracurricular activities planned and implemented by students as an opportunity to gain leadership skills and discover their passions and themselves. The mission of today's Y remains the same—to provide opportunities that will prepare students to become engaged, responsible citizens of the world. The Y seeks to broaden students' worldviews, and raise social, ethical, and cultural awareness through teamwork, community engagement, activism, and leadership.

The Caltech Y's mission and core values stand on five key pillars: leadership, civic engagement, service, adventure, and perspective. Regardless of which pillars capture

your interest, feel free to attend any of the below programs, or contact us to organize your own!

Here's a sampling of past programs held by the Y:

- Alternative Spring Breaks: Costa Rica, New York, Yosemite, San Diego, San Francisco

- Make-A-Difference Day: Hillsides Home for Children, LA County Arboretum and Botanic Garden, Children's Hospital Los Angeles (Coachart), Eaton Canyon, Lifeline for Pets

- Explore LA: Cirque Du Soleil TOTEM, *Next to Normal* musical, Norton Simon Museum trip

Upcoming events:

1. The Caltech Y Science Policy Series and Caltech Pre-Med Association present: a Bioethics discussion with Dr. Kohlase

Friday | January 24th | 12:00 noon to 1:30 pm | RSVP is required - lunch is provided, space is limited (priority given to students)

The Caltech Y Social Activism Series and Caltech Premed Association present Dr. Kohlase, a bioethicist from Huntington Hospital, who will explore the

debate of whether the right to patient autonomy has become illogically extreme, leading to demands by patients and families which result in medically ineffective treatment. Dr. Kohlase will discuss dynamic case examples of when physicians, patients, and families are in conflict with medical decision-making issues and discuss ideas for improving communication between the stakeholders.

The talk and discussion will be in 125 Steele from 12:00-1:30pm. Lunch will be provided, space limited to 25. Contact santoso.laura@gmail.com for more information or if you are interested in organizing similar events. The Science Policy Series was made possible with generous support from the George Housner fund. RSVP is required to guarantee a spot!

2. Mt. Waterman Day Hike

Saturday | January 25th | 9:00 am

I know your legs have been itching since all the calories from Grammy's fifth winter roast

ham found their way through your digestive system into your quadriceps, and now is your chance to relieve them! January 25th the Caltech Y-Outdoors is leading a basic day hike to Mt. Waterman. This will be a ~5 mile hike up to and down from the peak. Cost is limited to some gas money for your driver. You will need to bring lunch and some basic equipment (WATER (2+liters), layers, sturdy shoes, sun protection). Meeting time is 9:00 am at the Caltech Y (Just south of San Pasqual and Wilson, south of the Catalinas). We will only take as many people as we have drivers, up to 20. Email me wfrankla@caltech.edu if you have any other questions.

3. Talk and Book Signing: Alexis Ohanian, co-founder of Reddit

Thursday | January 23rd | 7:00 - 8:30pm (talk) | 8:30 - 10:00 pm (book signing and reception) | Hameetman Auditorium in Cahill

Alexis Ohanian (<http://alexisohanian.com/>), co-founder of Reddit which you're probably on right now, and author of *Without Their Permission* (<http://withouttheirpermission.com/>),

will give a talk about how he got to be so cool and how his book came about. He will also chat with one of our very own alums. There will be limited space so come early! Bring your Caltech ID to show at the door as well. The book can be purchased and Alexis will stay until all books have been signed and chat with as many people as he can in the Cahill Foyer. RSVP on the FB event page if possible to give us a feel for how many people will be attending the talk.

If you have any questions at all, feel free to contact the Caltech Y at (626) 395-6163 or caltechy@caltech.edu. Feel free to drop by at one of our weekly meetings at the Caltech Y at the Caltech Y (505 S. Wilson, next to CEFUCU), time TBA.

Go to <http://caltechy.org/lists/> to self-subscribe to announcement lists for upcoming events and sign-up information.

For a student's perspective, feel free to contact Phoebe Ann at phoebe.ann2@gmail.com or Laura Santoso at santoso.laura@gmail.com.

Research continues 20 years after Northridge quake

Continued from page 1

The project is mapping the San Andreas fault and discovering additional faults by setting off underground explosions and underwater bursts of compressed air and then measuring the transmission of the resulting sound waves and vibrations through sediment. According to Joann Stock, professor of geology and geophysics at Caltech, knowing the geometry of faults and the composition of nearby sediments informs our understanding of the types of earthquakes that will occur in the future, and the reaction of the local sediment to ground shaking.

In addition, Caltech scientists learned much through simulating—via both computer modeling and physical modeling techniques—how earthquakes occur and what they leave in their aftermath.

Computer simulations of how buildings respond during

earthquakes recently allowed Caltech professors Thomas Heaton, professor of engineering seismology, and John Hall, professor of civil engineering, to estimate the decrease in building safety caused by the existence of defective welds in steel-frame structures, a problem identified after the Northridge earthquake. Researchers simulated the behavior of different 6- and 20-story building models in a variety of potential earthquake scenarios created by the Southern California Earthquake Center for the Los Angeles and San Francisco areas. The study showed that defective welds make a building significantly more susceptible to collapse and irreparable damage, and also found that stiffer, higher-strength buildings perform better than more flexible, lower-strength designs.

Caltech professor of mechanical engineering and geophysics Nadia Lapusta recently used computer simulations of numerous

earthquakes to determine what role "creeping" fault slip might play in earthquake events. It has been known for some time that, in addition to the rapid displacements that trigger earthquakes, land also slips very slowly along fault lines, a process that was thought to stop incoming earthquake rupture. Instead, Lapusta's models show that these "stable segments" may become seismically active in an earthquake, accelerating and even strengthening its motions. Lapusta hypothesizes that this was one factor behind the severity of the 2011 Tohoku-Oki earthquake. Taking advantage of advances in computer modeling, Lapusta and her colleague Jean-Philippe Avouac, Earle C. Anthony Professor of Geology at Caltech, have created a comprehensive model of a fault zone, including both its earthquake activity and its behavior in seismically quiet times.

Physical modeling of earthquakes is carried out

at Caltech via collaborative efforts between the Divisions of Geological and Planetary Sciences and of Engineering and Applied Science. A series of experiments conducted by Ares Rosakis, the Theodore von Kármán Professor of Aeronautics and Mechanical Engineering, and collaborators including Lapusta and Hiroo Kanamori, the John E. and Hazel S. Smits Professor of Geophysics, Emeritus, used polymer plates to simulate land masses. Stresses were then created at various angles to the fault lines between the plates to set off earthquake-like activity. The motion in the polymer plates was measured by laser vibrometers while a high-speed camera recorded the movements in detail, yielding unprecedented data on the propagation of seismic waves. Researchers learned that strike-slip faults like the San Andreas may rupture in more than one direction (it was previously believed that these faults had a preferred

direction), and that in addition to sliding along a fault, ruptures may occur in a "self-healing" pulslike manner in which a seismic wave "crawls" down a fault line. A third study drew conclusions about how faults will behave—in either a classic cracklike sliding rupture or in a pulslike rupture—depending on the angle at which compression forces strike the fault.

"Northridge was a devastating earthquake for Los Angeles, and there was a massive amount of damage," Gurnis says, "But in some sense, we stepped up to the plate after Northridge to determine what we could do better. And as a result we have ushered in an era of dense, high-fidelity geophysical networks on top of hazardous faults. We've exploited these networks to better understand how earthquakes occur, and we've pushed the limits such that we are now at the dawn of a new era of earthquake early warning in the United States. That's because of Northridge."

Students discuss recommendations from Hunt Report

CONCERNED STUDENTS
Contributing Writers

In March 2007, President Jean-Lou Chameau and Acting Vice-President John Hall appointed a committee composed of students, staff and faculty, to be chaired by Vice Provost Melany Hunt. The committee's discussions culminated in what is known as the Hunt Report.

The charge included the timeless question: "Is Student Affairs successful in its roles of supporting students? Is the current office and management structure of Student Affairs appropriate and effective?"

In answering these questions, the committee members put forth a series of recommendations.

"The Committee strongly endorses the creation of a position for an Assistant or Associate Dean of Residential Life reporting through the Dean of Students. By centralizing the oversight of students' nonacademic and academic lives within the Dean of Students Office these two areas of responsibility will be integrated to allow for better support of students' lives both inside and outside of the classroom.

"The Assistant/Associate Dean would be responsible for ensuring

the well-being of students within Institute housing. In consultation and collaboration with the Dean of Students, undergraduate House leadership, graduate student leadership, and the Housing Office, the new Dean would develop policies and an approach that ensures the welfare of students while respecting and strengthening the balance between the Institute's responsibilities for their welfare and the unique role of student self-governance within the Houses.

"To be successful, the new Dean should possess certain critical experiences and qualities and receive sufficient support from the

administration in his or her efforts. The residential life Dean should have an advanced degree in Student Affairs or a related field, have a solid background in residential life programs, be knowledgeable about current laws that regulate student housing and activities, and be able to take a collaborative approach in the development of policies that govern student life in the Houses.

"He/she must demonstrate respect for student house leadership and the principle of student self-governance at the same time as he/she will be guided by the Institute's responsibility for student welfare in the Houses."

In 2011, Associate Dean Lesley Nye joined the Dean's Office to help Dean Kiewiet and Dean Green "in supporting the academic success and well-being of Caltech students." In the spirit of continuous improvement, we must ask ourselves if the establishment of this position has accomplished its mission. Ensuring well-being and welfare? Collaborative approach? Respect?

The answer to this question is left as an exercise for the reader.

The author(s) wish to remain anonymous to avoid a potential conflict of interest.

Brad/Chad: The Interview Series Part 1, Career Fair

BRAD CHATTERGOON
Contributing Writer

Hey ladies and gents. Hope everyone had a good MLK weekend.

It's week 3 and that means career fair will soon be upon us (as will midterms).

As a frequent visitor to the career fair, I can tell you that it is hot and not particularly well ventilated. Bear this in mind when deciding on your "Give me a job" outfit.

Here are some recommended guidelines to follow.

Gents:

1.) Deodorant. And not just that body spray stuff either. I mean real antiperspirant deodorant. As I mentioned before it is hot and not well ventilated, which leads to all sorts of olfactory wonders.

2.) Do dress well. A career fair is all about making some sort of impression on the recruiters so that they will remember who

you were instead of just noticing that you happened to drop off a resume. That said, no impression is better than a bad impression, and that includes your clothing choice. Opt for a pair of your better looking jeans or a nice pair of khakis or chinos, all of which are expected to be devoid of rips and discolorations despite how cool you think they are. Also, you probably won't look any more like a CS major just because you decided to show up in your PJs, so avoid those as well.

3.) Do not wear a full suit. I repeat NO SUITS. Every career fair I see the few guys that show up in a suit. I'm being very adamant about this so I'll defend my position. Firstly, like



Sophomore Dryden Bouamalay preps to get a job.
-Jonathan Schor

I said before, it is hot. Do you know what suit jackets are good at? If it's well tailored, then it's good at making you look awesome but regardless of that, it is good at keeping you warm. You can probably do the math here, but for you bio majors out there (I jest), Hot Day + Attire to keep warm = Perspiration. Next, why are you wearing a full suit to the career fair? I understand that you want to make a good impression, but these people haven't even offered you an interview yet. Why are you investing so much in trying to impress them when they haven't invested back in you?

4.) I recommend a tie, but this is personal preference. Here are some guidelines for a tie.

Thinner ties are, in general, better, but also try to pair the size of your tie with the width of your body. Wider individuals can benefit from a wider tie whereas thin individuals should avoid them like the plague. Learn to tie a tie.

Just google it if you don't know how and for a career fair I recommend a pratt knot for just the right bit of formality paired with a hint of youthfulness.

Ladies:

1.) See number one above.
2.) Business Casual is the buzzword here. According to my sources your goal should be either a pair of slacks in a neutral color, a trim skirt in a likewise neutral color, or a pencil skirt in black.

3.) As for your top, a nice solid color blouse in a non-neutral color will work well.

4.) Shoes are flexible but do avoid trainers or sneakers. Best of luck at the career fair!

THE CALTECH COUNSELING CENTER IS LAUNCHING A NEW PROGRAM FOR STUDENTS:

There will now be evening drop-in hours for consultation on Monday and Wednesday evenings from 7-10pm. The slots will be divided in 30 minute segments and can either be signed up for in advance, or students can come and block off the time that they want by marking an "X" on the white board next to the time that works for them. They will be held on the 2nd floor of the CSS building in the health educator's office. Access will be through the stairwell on the south side of the building.

*Contact the Counseling Center if you have any questions.
(626) 395-8331*

The Crystal Method releases modern pop EDM album

NAILEN MATSCHKE
Contributing Writer

The genre of electronic dance music (EDM) is by all means an ever-changing one, with different points in its history decidedly

this style, while the popular eye had moved on, making it a weak entry into a dying scene.

Then 2009 saw the release of *Divided by Night*, where the group made some effort to update themselves but ended up sounding

same beat for a couple minutes at max volume; the bass in this song is almost painful to listen to.

Luckily the next song, "Over It," is a great improvement, with some of the coolest synth riffs and licks I've ever heard and an impossibly

the peak of its annoyance about midway through the track when we are treated to almost 25 nonstop seconds of parts of it being repeated over and over.

As a sort of throwback to The Crystal Method's roots, "110 to

more mellow than its predecessors, with some emotional vocals and cathartic clean synth chords thrown in for good measure.

I could see it getting some radio play, though there's nothing really catchy about it to point to.

"Difference," on the other hand, was another favorite, with a perfect balance and interplay between the instruments and the vocals and masterful transitions from each section to the next, across the spectrum of volume and aggression.

It also has a disgustingly sick beat that pulses and pushes the song forward with pure power.

"Metro" follows as a strange, ethereal break in the album filled with airy synths and a long sample taken from inside a subway car.

In a way, it sets up the more low-key "After Hours," though it turns out to be a bit disappointing since it's mostly another exercise in popular modern EDM production.

In the end, *The Crystal Method* is still recognizable (as one should hope) as a Crystal Method album, with relentlessly synth-laden textures and not a single sonic imperfection.

It certainly is darker and more aggressive than

their previous work, unashamed to draw inspiration from popular dubstep acts and adopt modern percussion conventions over the breakbeats of the '90s.

There are still moments where the group slips back into their past (such as the second half of "110 to the 101"), but it's more a tasteful addition of variety now than the dependence it has been in prior work.

It crosses over many modern sub-genres excellently, but it doesn't excel in much else.

Anyone who's followed other aging EDM acts like The Prodigy, Fatboy Slim, or the Chemical Brothers will probably appreciate this album, but in reality it doesn't add anything to the already well-populated EDM genre and can be safely overlooked.



-<http://thecrystalmethod.com/>

linked to specific sounds. For many people, the mid- and late '90s were marked by the big beat style, full of repeated breakbeats and low, powerful synth lines.

The Crystal Method was the American answer to the British dominance of the scene, producing tracks that were almost impressive in the sheer amount of electronic precision and gloss that they possessed.

After meeting in Las Vegas and then moving to Los Angeles, the duo released their first album, *Vegas*, in 1997.

This made them relative newcomers to their genre, but both *Vegas* and its 2001 follow-up, *Tweekend*, are regarded as some of the best work of the time period. However, 2004's *Legion of Boom* didn't mark any deviation from

like they weren't quite sure how to do so.

This year, they tried to change this with their self-titled LP, which released on January 14.

One thing is indisputable: they definitely figured out how to produce a more modern sound.

While this may sound like a good thing, it is instead one of the album's greatest weaknesses as it quickly becomes a 50-minute showcase of modern pop EDM more than anything else.

The album's opening track, "Emulator," was unfortunately released as the lead single to the album, as it is one of the album's weaker songs.

The best comparison for it would be an attempt to make an angrier Daft Punk that got wrapped up into looping over the

catchy hook delivered. The structure of this song is also nice, if simple, with a constant buildup for the first half followed by a bright, string-driven bridge.

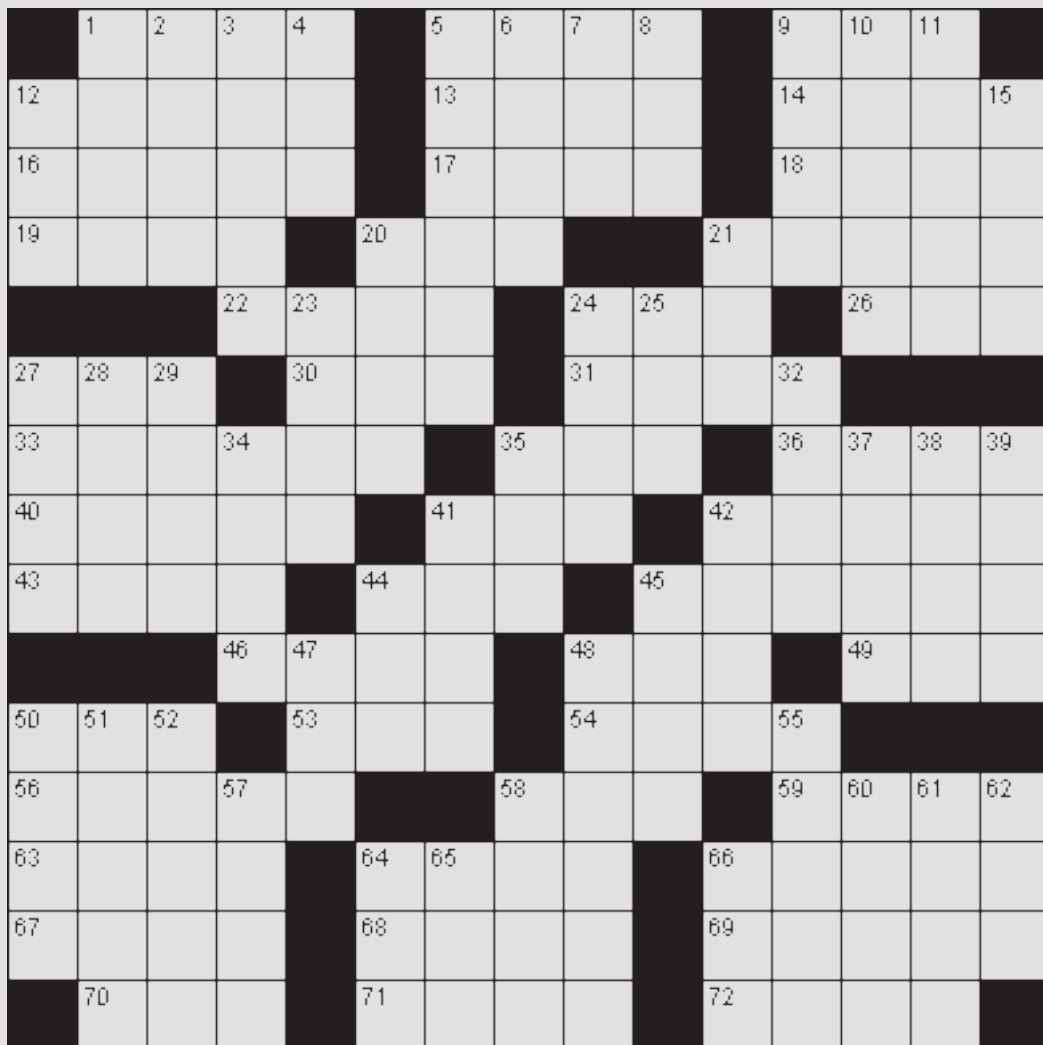
Track three, "Sling the Decks," is acceptable, as it spends a couple minutes building up to a well-executed half-time section, but then seems unsure where to go and retreats into repetition.

"Storm the Castle" starts off loud and basically just alternates between cliché, half-minute breaks and in-your face beats, synths, and vocals.

The repeated vocal clip in this song is one of the most egregious examples of pointless sampling that I've ever heard.

It's not just irrelevant and grating, but needlessly loud and overpowering as well. It reaches

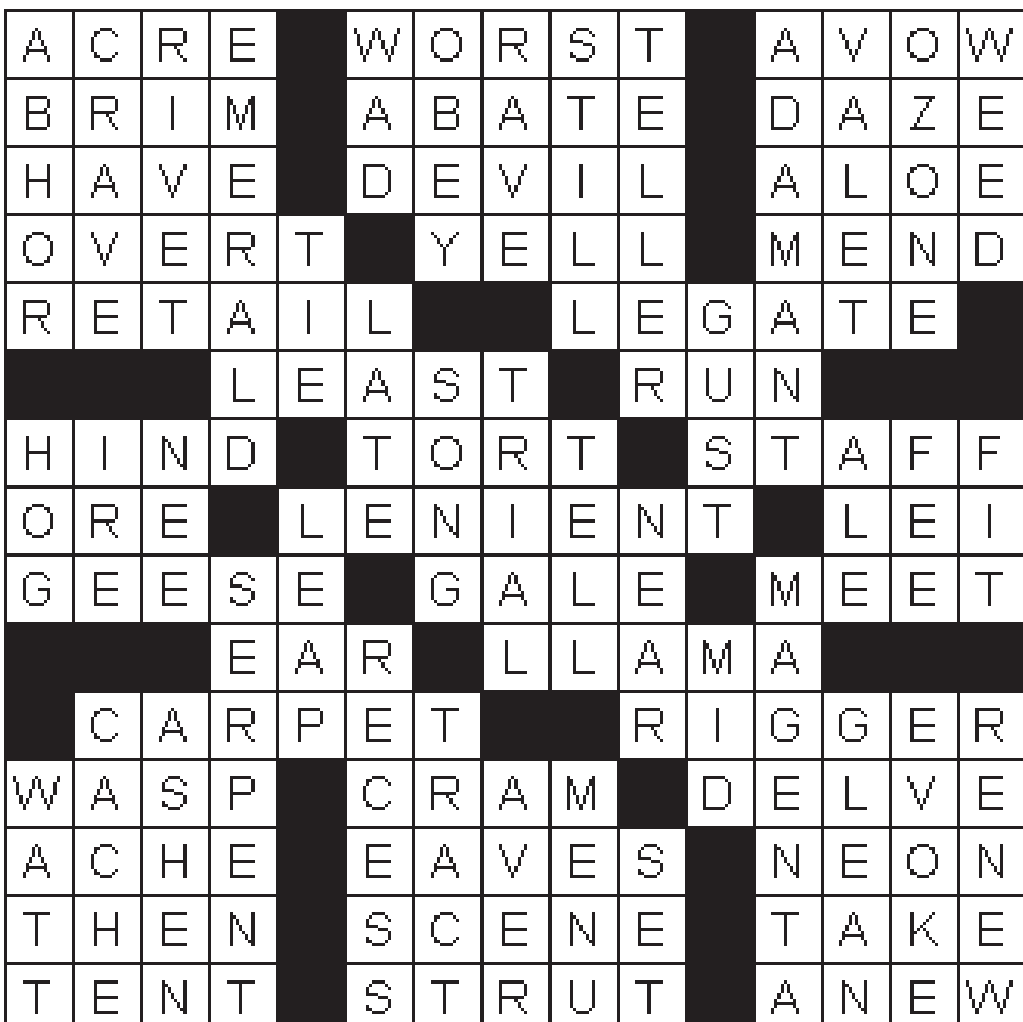
Today's Puzzle: Crossword



[www.puzzlechoice.com]

- Across**
- 1. Large brass instrument
 - 5. Type of file
 - 9. Astern
 - 12. Relating to audible sound
 - 13. Malevolence
 - 14. Average
 - 16. Aplomb
 - 17. Urban area
 - 18. Group of three
 - 19. Singing voice
 - 20. Young goat
 - 21. Colossus
 - 22. Orderly
 - 24. Number of items in a brace
 - 26. Moose
 - 27. Pastry item
 - 30. Beer
 - 31. Submerged ridge of coral
 - 33. Recommendation
 - 35. Assistance
 - 36. Particle
 - 40. Gear projections
 - 41. Limb
 - 42. Clan
 - 43. Leporid mammal
 - 44. Hard-shelled seed
 - 45. Part of the ear
 - 46. Miserly
 - 48. Offspring
 - 49. Oculus
 - 50. Witness
 - 53. Pertinent
 - 54. Roman cloak
 - 56. Mettle
 - 58. Part of a Morse code signal
 - 59. Hirer and firer
 - 63. Impulse
 - 64. Object of worship
 - 66. Automaton
 - 67. Roofing material
 - 68. Misplace
 - 69. Tusk
 - 70. Snakelike fish
 - 71. Sharp
 - 72. Encounter
- Down**
- 1. Implement
 - 2. A single undivided whole
 - 3. Large shaggy bovid
 - 4. Hotshot
 - 5. Narrate
 - 6. Zealous
 - 7. Be seated
 - 8. Travel a route regularly
 - 9. Not in favor
 - 10. Part of a sword blade
 - 11. Test
 - 12. Health spring
 - 15. Member of a religious order
 - 20. Type of cabbage
 - 21. Forepart of a hoof
 - 23. Apiece
 - 24. Pare down
 - 25. Marry
 - 27. Track
 - 28. Notion
 - 29. At any time
 - 32. Cultivate by growing
 - 34. Detail
 - 35. Products of human creativity
 - 37. The fourth dimension
 - 38. Comply
 - 39. Small pond of standing water
 - 41. Female relative
 - 42. Tart spicy quality
 - 44. Short sleep
 - 47. Consume
 - 48. Purloined
 - 50. Closed
 - 51. Spooky
 - 52. Bird of prey
 - 55. Higher up
 - 57. Bobbin
 - 58. Measured portion of medicine
 - 60. Woodwind
 - 61. Classify
 - 62. Pig pen
 - 64. Kind of person
 - 65. Female deer
 - 66. Flange

Answers to last week's crossword puzzle from puzzlechoice.com



Caltech Public Events is now hiring student ushers. \$15 per hour to work concerts, performances, lectures, films and parties.

*No experience needed, no hard labor, flexible schedules.
Requirements: Caltech student, Positive attitude, Friendly personality

To apply email Adam Jacobo (ajacobo@caltech.edu) or call (626) 395-5907

For info on Caltech Public Events visit: www.caltech.edu/content/public-events

Swim team grabs victories over Mills and Chapman

GoCaltech

The Caltech swimming and diving team welcomed Chapman and Mills for a tri-meet on Sunday afternoon at the Braun Pool.

The men's team posted a win over Chapman while the ladies grabbed victory over Mills.

During the men's dual meet between Chapman and Caltech, the Beavers came away with wins in 10 of the 13 events. In the head-to-head competition between the Beavers and Mills, Caltech won 11 of the 13 events.

In the tri-meet on the women's side Chapman and Caltech claimed all the first place finishes. Leading the way of the Beavers was Jacqueline Masehi-Lano.

She started her day with a win in the 200-yard IM by touching the wall in 2:23.84. Three races later the junior won the 100-yard butterfly in 1:01.24.

Kalyn Chang claimed first place during the 100-yard freestyle race as the first-year was just over a second faster than the runner-up with a time of 1:01.07. Chang had a great swim in the 50-yard freestyle as she placed second with a time of 27.76 which was just .07 seconds slower than the top finisher.

Iris Liu battled well in the 100-yard breaststroke event. The senior's

effort came up just short of first-place by under three seconds as she clocked a time of 1:21.29.

The competition got off on the

time of 1:49.28. In the 200-yard individual race, Bradley touched the wall in 1:55.96 to outdistance himself from his nearest

Gao claimed an individual event win as well by winning the 100-yard breaststroke in 1:12.78.

Yu won a pair of events to help

C.J. Culpepper posted a start-to-finish win during the 500-yard freestyle race. The junior posted a time of 5:19.51 which was nearly 20 seconds faster than his closest competitor in the race.

In the men's 100-yard race, sophomore Patric Eck posted a time of 49.75 to top Taylor Ford to exact a measure of revenge after Ford won by .08 seconds over Eck in the 50-yard race.

On the diving board Ben Grabowski posted a pair of personal best scores en route to two first place finishes. The junior started the day with a score of 210.95 on the three-meter board, and then tallied 203.10 points when he won the one-meter



Caltech divers and swimmers compete at home against Chapman and Mills.

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right foot for the men's team. The Caltech 200-yard freestyle relay team of Leon Ding, Galen Gao, Kevin Yu and Chris Bradley posted a 10-second win with a finishing

competitor by over nine seconds. Ding also won an individual event as he claimed the top spot during the 100-yard butterfly race with a finishing time of 56.98.

boosts the men's team victory. He won the 200-yard IM with a time of 2:08.52 then proceeded to claim victory in the 100-yard backstroke (57.50).

competition.

This meet against Chapman and Mills marks the first collegiate head coaching wins for Caltech's first-year coach Jack Leavitt.

Caltech welcomes Gardner as head volleyball coach

GoCaltech

The Caltech Athletics, Physical Education and Recreation department is pleased to announce the hiring of Tom Gardner as the head women's volleyball coach.

He is the 12th head coach in the program's 38-year history. Gardner will begin his appointment in February.

"I am excited for the opportunity to coach at one of the top schools in the country with dedicated and driven student-athletes," Gardner said. "I will build the same level of confidence in my athletes that they have in the classroom to bring great success to Caltech Volleyball."

Gardner spent the past three seasons as the head coach of Southern Maine. During the 2013 season he guided the Huskies to the best record in school history (22-11) en route to being named the Little East Conference's coach of the year. He took a program that had six wins the season prior

to his arrival to the school's first conference tournament appearance in a decade.

"Tom was a joy to discover in our search process. He is a thoughtful educator of young people, someone committed to development and support every bit as much as to driving skill acquisition and competitiveness," said athletic director Betsy Mitchell. "He has the volleyball knowledge and coaching experience that we need to



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continue the positive momentum of Coach Lindsay provided. In addition he has the motivational skill, communication style and understanding of the learning process required to work with students that have a range of abilities. Tom is also a physical educator who looks forward to the dual aspects of this position and teaching the general student body in our physical education program as well."

Prior to his stint with the Huskies he served as the varsity coach at Cactus Shadows High School (2007-2011) in Cave Creek, AZ. Gardner tallied an outstanding

record of 45-1 in the Desert Sky Region leading the squad to the conference's championship four times. Moreover, his teams placed second in the state twice and earned a third and fifth place finish during his tenure.

While serving at Cactus Shadows, Gardner also held the position as recruiter and scout for Trevecca Nazarene University in Nashville, TN (2008-2001) and was the Club Director for Club Summit Volleyball in Scottsdale, AZ (2005-2011).

The native of Manhattan Beach, California earned his Master's of Education in Educational Leadership from Northern Arizona University in 2007 and his bachelor's degree in Advertising in 1993. Gardner also earned a Teaching Certification from Northern Arizona in 1997.

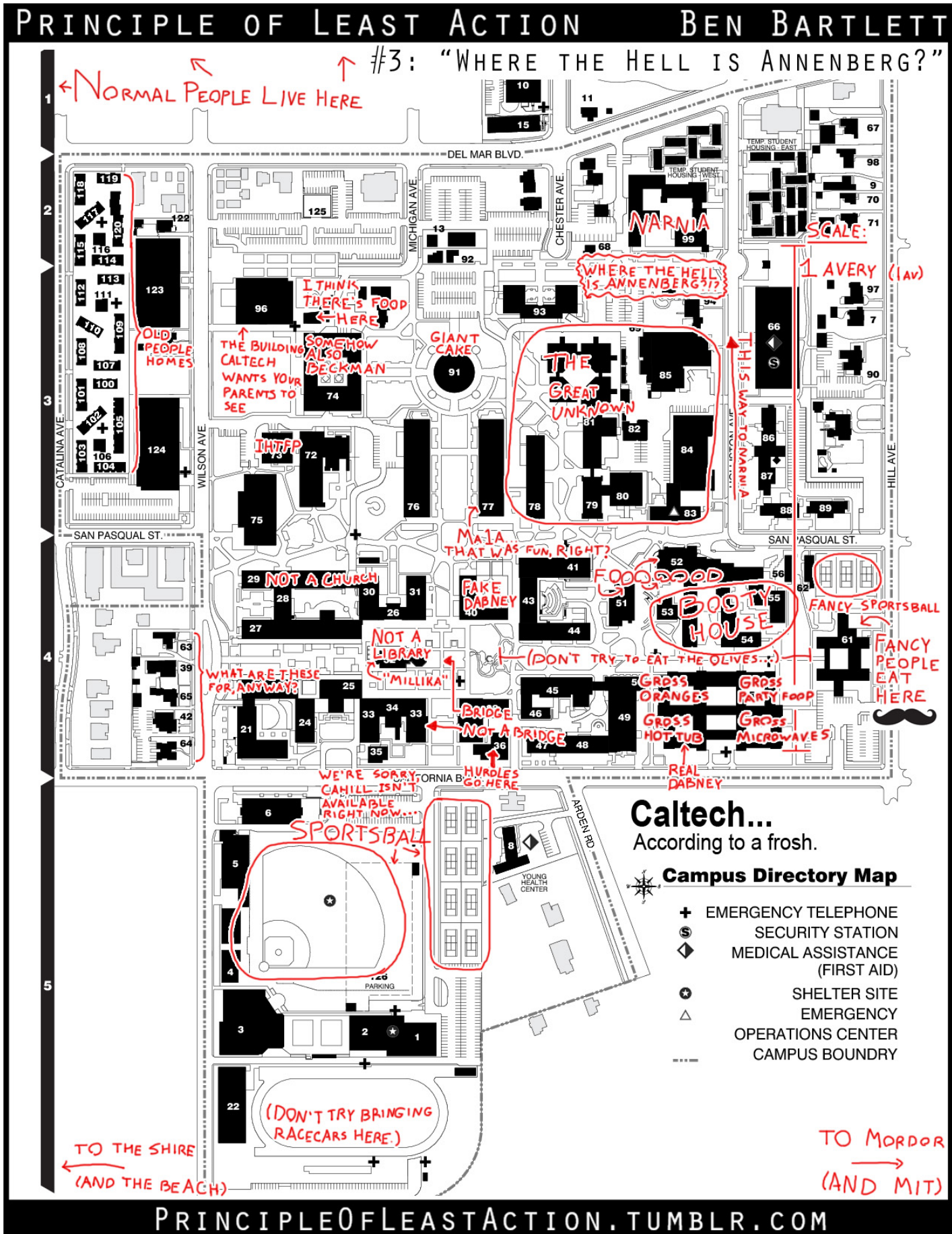
He takes over the helm of the program from Jodi Lindsay who resigned after four seasons to pursue club coaching opportunities.

Weekly Scoreboard

Women's Basketball
@ Claremont-M-S
L, 88-39 Final

Men's Basketball
@ Claremont-M-S
L, 75-50 Final

Women's Basketball
vs. Whittier
L, 100-73 Final



For more photos, videos, and archives of previous issues, check out the Tech website!

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The California Tech
Caltech 40-58
Pasadena, CA 91125