



VOLUME CXVIII NUMBER 7

PASADENA, CALIFORNIA

TECH.CALTECH.EDU

NOVEMBER 17, 2014

The California Tech

Matthew Elgart gives strong six-string performance

ALEX BALL
Contributing Writer

Dabney Hall burned to the ground during an intentionally fiery performance by classical guitarist Matthew Elgart last Saturday evening, one of four planned in the Los Angeles area. Elgart showcased his command of the instrument to benefit the Caltech performing and visual arts department. The concert featured pieces by Villa Lobos, Krenek, Satie, Scarlatti, Ponce, and Bach, as well as two original compositions.

The program pitted elegant, classical pieces against jagged, modern ones. To a less flexible player, the conflict of styles would have spelled disaster, but Elgart used the clash to keep the audience's attention. Percussive twangs and atonal phrases would

transform into beautifully sweet progressions, and would do so extremely smoothly, thanks to Elgart's enlightened sense of dynamics. This contributed to a strong sense of premeditation in the performance, a sense that there was a specific idea the audience was supposed to take away from each passage.

The whole effect was compounded by the intimate setup of the venue. The audience surrounded Elgart's chair in concentric half-circles, with a single spotlight illuminating him and his guitar, the two of which fought for attention throughout the



Matthew Elgart performed the concert with just him and his guitar, surrounded by concentric half-circles of chairs for the audience.

Photo Courtesy of Alex Ball

performance. Elgart would set up pieces with a short anecdote or humorous comment, then have to adjust his seat and footrest to accommodate the apparently-too-stubborn-to-move instrument. The guitar, though, loved attention, and so would quickly be coaxed into playing. From the audience's point of view, Elgart may as well have been talking out loud to his guitar during the performance. This "conversational" style that Elgart conveyed really elevated his concert from musical exposition to a kind

of grand performance. And who wouldn't want to watch that? An unconventional concert by an unconventional man, I would highly recommend any of Dr. Elgart's future performances, especially if you never considered yourself a concert-goer.

In addition to performing, Elgart also teaches beginner, intermediate, and advanced level classical guitar classes at Caltech each term. If you have any interest in either learning how to play guitar or how to be cooler than you currently are, you should consider enrolling. No previous experience or guitar ownership is required. The classes are a mix of technique instruction, solo and ensemble practice, copious amounts of life advice, and explanations of what it means to have a conversation with the guitar.

Techers come out for fun at the SAAC carnival



The SAAC carnival was just a clever recruiting tactic on behalf of the athletes. Students were lured in with sushi and then given the opportunity to play carnival games, which all conveniently resembled intercollegiate sports teams at Caltech. Coincidence? I think not.

Photos Courtesy of Monica Enlow



(From left) Henry Baer looks like he's having a lot of fun. The sushi was good. 10/10, Grace Park and Rachel Morton. Now that soccer is over, Christopher Haack tries his hand and face at baseball.

Photos Courtesy of Monica Enlow

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Caltech Y Column

CALTECH Y

The Caltech Y Column serves to inform students of upcoming events and volunteer opportunities. The list is compiled by Neera Shah from information given by the Caltech Y and its student leaders.

Founded by students in 1916, the Y was organized to provide extracurricular activities planned and implemented by students as an opportunity to learn leadership skills and discover 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, raise social, ethical, and cultural awareness through teamwork, community engagement, activism, and leadership. More information about the Caltech Y and its programs can be found at <https://caltechy.org>. The office is located at 505 S. Wilson Avenue.

Upcoming Events:

1. Reproducibility in Science Seminar Series: A Conversation with Professor David J. Anderson

Thursday | November 20th | 12:00 to 1:30 PM | Steele Library Rm 114

Lunch is provided, but space is limited | RSVP required

For the next installment of our scientific reproducibility series, we will be discussing the reproducibility of biological findings including the impact of experimental design and the interpretation of results. Prof. Anderson will discuss his experiences with these and similar issues.

David J. Anderson, Ph.D., is Seymour Benzer Professor of Biology at the California Institute of Technology where he has been on the faculty since 1986. Dr. Anderson is also an Investigator of the Howard Hughes Medical Institute. Dr. Anderson received his A.B. from Harvard, Ph.D. from the Rockefeller University under Gunter Blobel and was postdoctoral fellow with Richard Axel at Columbia. Dr. Anderson played a key advisory role in the initial foundation of the Allan Institute for Brain Sciences and the Allen Brain Atlas, and now serves on their Scientific Advisory Board, as well as on the Advisory Council for Project MindScope and the Connectional Atlas. He has also been a Visiting Scientist at HHMI's Janelia Farm Research Campus. Dr. Anderson received the Alden Spencer Award in Neurobiology from Columbia University in 1999, and was elected to the National Academy of Sciences in 2007.

2a. Pasadena LEARNS

Friday | 3:00 - 5:00pm | Madison and Jackson Elementary School | Pasadena

Come volunteer at Madison and Jackson Elementary School! We are partnered with the Pasadena

LEARNS program and work with their Science Olympiad team or do regular tutoring along with occasional hands-on science experiments. Transportation is provided. For more information and to RSVP, contact vkkumar@caltech.edu.

2b. Hathaway Sycamores

Thursday | 5:30-8:30pm | Highland Park

Volunteer at Hathaway-Sycamores, a group that supports local underprivileged but motivated high school students. There are a variety of ages and subjects being tutored. The service trip includes about an hour of travel time and 2 hours of tutoring. Transportation is included. For more info and to RSVP email Sherwood Richers at srichers@tapir.caltech.edu.

Other Announcements - Beyond the Caltech Y

Reading Partners in Pasadena

Reading Partners in Pasadena is looking for community volunteers to help provide one-on-one support for elementary school students reading below grade level. Our volunteers become so much more than just reading partners. By sharing their knowledge and experience, tutors become mentors, friends, and positive role models in the life of a child. Our organization is partnered with four high-need schools in the Pasadena area, and Madison Elementary is just 2 miles from Caltech's campus. The program model is backed by evidence-based research, proving students in the program make significant gains in reading. With as little as one hour a week, you can become a reading partner and tutor a child, changing his or her world and yours. To join us, please contact Chloe Oliveras, Volunteer Coordinator at chloe.oliveras@readingpartners.org.

Ongoing Volunteer Opportunities:

1. Pasadena Unified School District Tutors Needed

Pasadena High Schools have started after-school tutoring programs coordinated by teachers. Tutors are needed at each school to help out with the tutoring. This is a great way to work directly with teachers and students. Tutors may volunteer on any days for which they are available. High School tutoring/homework help hours are as follows:

- Blair High School M-F 3:20-4:30 (Math) contact Ronaldo Hunter at (626) 720-2578

- Marshall High School M-F 3:05-4:30 (All Subjects) contact Cati Acevedo at (626) 720-2587

- Muir High School M-Th 3:20-6:00 (All Subjects) contact Nicole Stephens (626) 720-2567

- Pasadena High School 3:20-6:00 (All Subjects) contact Arman Ter-Grigoryan at (626) 720-2589

If you have any questions feel free to contact the Caltech Y at caltechy@caltech.edu.

Philae lander makes history

HANNALORE GERLING-DUNSMORE
Contributing Writer

On Nov. 12, the European Space Agency (ESA) made history with the first controlled landing on a comet, as the Philae lander touched down onto Comet 67P/Churyumov-Gerasimenko (67P), a 4.1 km x 4.5 km comet 500 million km from Earth. To give a sense of scale for the distance to 67P, consider that data from Philae took a full 28 minutes to travel back to Earth while being transmitted at the speed of light.

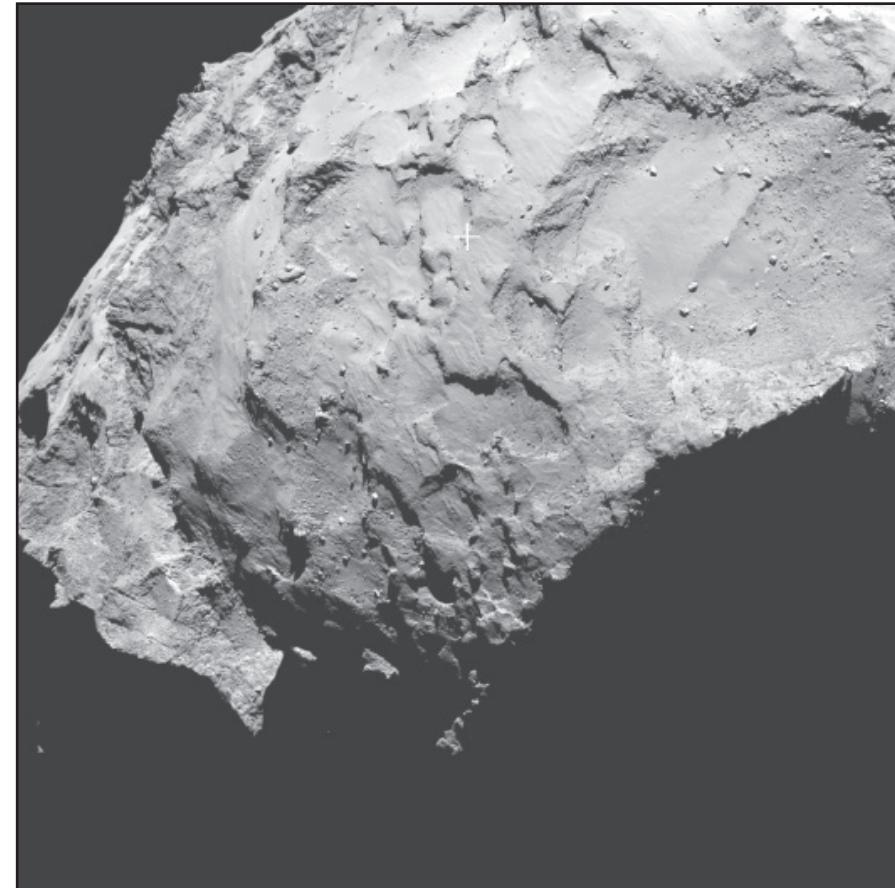
Philae was launched with the Rosetta spacecraft on March 2, 2004, and traveled a total distance of 6.4 billion km to get to 67P. On Nov. 11 and 12, a series of Go/NoGo checks were performed on Philae, revealing that the lander's downward thruster was not working. However, due to hopes of being able to repair the thruster, Philae was given the Go. At 08:35 UTC (Coordinated Universal Time; approximately equivalent to Greenwich Mean Time) on Nov. 12, Philae detached from Rosetta and landed on

67P seven hours later. Philae had a total of three landings, as the first two attempts to land resulted in the 98-kilogram Philae bouncing off the comet's surface. The first bounce was the largest bounce of a lander in history, at approximately one km in height, and lasted about two hours; the second bounce lasted about seven minutes.

Once settled onto 67P, Philae's harpoon (designed to anchor the lander to the comet) failed to fire. However, Philae remained on the

comet, though with a new challenge. Due to the landing difficulties, Philae ended up approximately one km from its intended landing site, which put it in the shadow of a cliff. Subsequently, Philae received only 1.5 hours of sunlight per day, instead of the intended six to seven hours. As Philae's battery only had approximately 60 hours of charge

On Nov. 14, Philae was lifted 4 centimeters and rotated 35 degrees in an attempt to get more sunlight to the lander's solar panel. Despite the repositioning, Philae lost power later at 00:36 UTC on Nov. 15. As 67P and its new passenger travel closer to the sun, Philae may find itself in an orientation with more sunlight, and thus may



Philae's primary landing site was Site J, located on the head of Comet 67P/Churyumov-Gerasimenko.

-<https://www.flickr.com/photos/europeanspaceagency>

and extremely limited means to recharge by its solar panel, the ESA had to prioritize the data Philae was to collect. Amongst the most vital data was a soil sample taken from a 25-centimeter hole Philae drilled in the comet, which Philae then analyzed before transmitting its results. Philae also used radio waves to image the internal structure of the comet and took stunning photographs of the comet's surface.

regain power at a later point. The ESA will continue to search for a signal from Philae, in case it does power back on. However, even if Philae never again re-establishes communication with Earth, the mission has been considered a massive success. The data collected from 67P will help answer questions about the formation and evolution of the solar system as well as potential roles comets may have had in Earth's early history.

News briefs from around the globe

Need to know ~ 100 words about the world this week

New treatment for Ebola targets virus in blood

1st trial in filtering virus out of patient's blood proves successful [[TIME](#)]

Refurbished federal exchange website back online

100K new applications on first enrollment day proves far better than 2013's six [[NYT](#)]

Australia, China agree to free trade deal

95% Australian exports to China hoped to be tariff free in coming years [[BBC](#)]

Tsunami alert lifted after Indonesia quake

7.3 quake caused brief tsunami alert; no casualties reported yet [[BBC](#)]

Future of Okinawa US base uncertain

26k troops' future uncertain as base opposition candidate set to win gov. elections [[BBC](#)]

Corruption discovered in Brazilian oil firm Petrobras

18 arrested so far as police raids uncover corruption and money-laundering scheme [[BBC](#)]

Obama confirms another ISIS attack

26-year-old US aid worker Peter Kassig becomes latest victim to ISIS beheadings [[TIME](#)]

FEATURE

THE CALIFORNIA TECH

NOVEMBER 17, 2014 3

Bloodstone & Diamonds contributes little to metal

NAILEN MATSCHKE
Contributing Writer

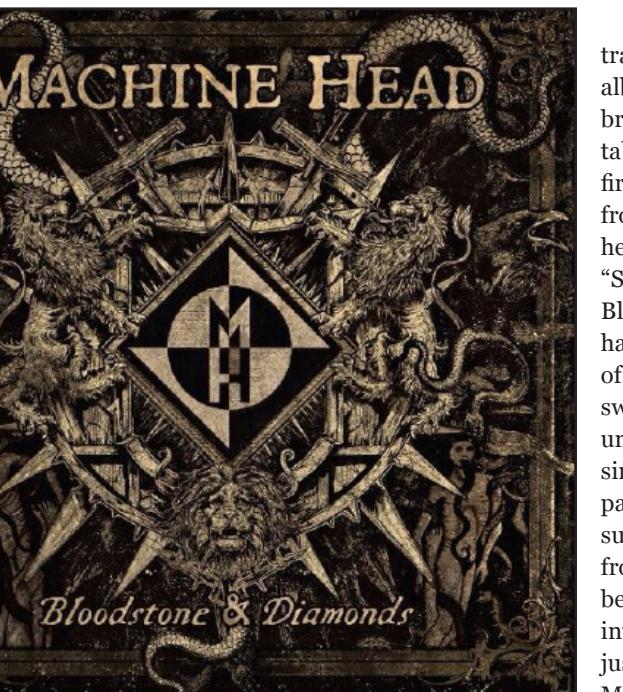
Machine Head, as one of the prominent acts of the New Wave of American Heavy Metal (NWOAHM) around the turn of the century, bears much of the responsibility for the aggressive, primarily death metal-influenced style of instrumentation that has dominated American metal within the past decade, but also (along with acts like Lamb of God) helped pioneer "groove metal," a more riff- and melody-oriented style. Despite little significant change in their musical style, through steady output and touring they have managed to cement themselves as a quintessential part of modern metal, and it would be difficult to argue that they don't deserve it. *Bloodstone & Diamonds*, released Nov. 7, stands as their eighth full-length studio album since 1994. This newest effort is certainly a worthy addition to their discography, displaying a band that functionally is a well-oiled metal-producing machine. However, compared to the field it's being released into, it just doesn't stand out, except as an example of why producing such sterile albums simply isn't a viable tactic anymore for metal.

The album comes in with its second-longest track, "Now We Die," a pounding but forgettable attempt at the sort of epic sound, complete with a string intro and backing to the chorus that makes symphonic metal so hilariously entertaining. The main riff is respectable, but quickly devolves into eighth note chugging and some slides, the sort of thing your typical middle school metal band would write, not to mention the utterly uninventive drums. The minute-long guitar solo is another place where Machine Head's disconnect from their competition is apparent;

it pales in comparison to the much more stylistically innovative (and usually more impressive) guitar work of progressive crossover acts like Between the Buried and Me or The Dillinger Escape Plan, and no amount of fancy hammer-ons and tapping can make up for the fact that bluesy, thrash-style solos have been the norm since the '80s.

This sort of reliance on early NWOAHM songwriting clichés continues on for much of the album. The second song, "Killers & Kings," doesn't do much better in the guitar department, with the same sort of simplistic chugging interspersed with some four-note licks that legitimately sound like what my friends and I produced when we were 13 years old, not 20 years into our career. Both of the song's breakdowns disappoint as well, doing little else besides satisfying the "brutal chugging" requirement, especially as far as any sort of complex rhythm is concerned. Its successor, "Ghosts Will Haunt My Bones" is even worse on the instrumental front, with a repeated theme that sounds like something Hatebreed would write, which for the unfamiliar is a *really* low standard, and even though the track features quite a bit of clean vocals, Rob Flynn does little to differentiate himself from any other mainstream metal vocalist of this era, ending up sounding like a calmer Corey Taylor (of Slipknot).

The fourth track, "Night of Long Knives," is pleasantly relatively interesting, telling a story about the Manson family that "brings the night of long knives" in "the hills



-<http://commons.wikimedia.org>

of Hollywood," a more memorable theme than its company, backed by some particularly aggressive instrumentation, even (shockingly) including a couple blast beats. This brings me to one of my biggest complaints about the album, which is that the drums are just flat-out bad. Dave McClain has manned the kit for Machine Head since 1995, and one would think that this naturally leads to some degree of technical proficiency. This album is completely devoid of polyrhythms, complex footwork, or really any effort put into keeping the space between snare hits interesting. Metal drumming is a skillful art with some truly impressive members, and for a band as big as Machine Head to just fall so short on the percussion is nothing short of disappointing.

The remaining tracks on the album don't bring much to the table on top of the first few, apart from some quirks here and there. "Sail Into the Black" has a first half comprised of some bass swirling around underneath a simple acoustic pattern and subdued singing from Rob Flynn, before exploding into basically just another Machine Head song. "Beneath the Silt" has a nice Southern feel to it, with deep, swinging riffs à la Down and undeniably Phil Anselmo-influenced vocals, but this also basically the only thing that happens in the entire song, which feels like a waste of one of the more unique songs.

After that the album starts to get weird, with "In Comes the Flood" starting off with an off-key sample of "America the Beautiful" before transitioning to an almost cringeworthy song whose chorus involves the line

"Wake up, America," amidst other edgy assertions such as "I wanna burn down Wall Street, baby." My favorite, though, is "Imaginal Cells," which is three and a half minutes of samples from the audiobook *Spontaneous Evolution* with lines about the future of human civilization like "the fractal image will repeat itself" and other pseudoscientific mumbo-jumbo. While I understand the band probably included it mostly for the aesthetic, it doesn't add anything to an album that already suffers in other, more important areas.

As a genre, metal has displayed an impressive resilience to the changing music landscape since its inception in the '70s and '80s, managing to sustain its fanbase as contemporaries like punk come and (for the most part) go. As it has pushed the boundaries of abrasiveness and fragmented into increasingly divergent subgenres, the space for mainstream, "accessible" metal has shrunk, and while some bands have been able to adapt, Machine Head just doesn't seem to have put any effort into doing anything but what they've always done. I'm sure hardcore fans of the band will appreciate *Bloodstone & Diamonds* as another addition to the collection, but at this point it adds very little to the metal lexicon, and most metal fans can safely skip it.

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Special Free On Campus Student Screening of Interstellar December 1

On the evening of **December 1**, Caltech students will be treated to an amazing Caltech-only experience featuring a screening of the movie *Interstellar* with a special talk on the science in the film by Professor (and Alumnus) **Dr. Kip Thorne**. Dr. Thorne has been an Executive Producer and the science advisor for the film and was involved in it from its inception, ensuring that real science is built into its fabric. He has also written the book "The Science of *Interstellar*," which should NOT be read before viewing the film; it is full of spoilers.

Please save the date and plan on joining your fellow students for what will most definitely be a thrilling, unique inside look into the movie *Interstellar* and the science behind it. More details will be sent to all students in the near future. Save the date!!!!

“Kshit”: the name in front of the man

KSHITIJ GROVER
Contributing Writer

Hey Techers! Thanks for picking up a copy of the paper this week—I’m a sophomore and I’ll be writing some thoughts in this very column a couple times a month. Naturally, I thought I’d start by introducing myself. Now, I know what you’re thinking ... don’t get intimidated by the jumble of letters you see above this article. Most people know me as “Kshit.”

You see, introducing myself has never been easy for me. My name, Kshitij, is rather peculiar. Just ask any substitute teacher who’s ever had to read roll call. Just ask every interviewer who’s started the conversation with “So I don’t want to mess this up. How do you say your name?”

At first, it used to bother me. It stopped me from going up to people at events—I would have to explain to them how to pronounce my name all over again.

The “K” is actually silent, and there’s not a hard “t” in there.

After three or four times, maybe they’d get it. Maybe they wouldn’t. It didn’t matter, because I didn’t particularly make the effort to correct them. I saw it as a ritual and a drag. It was an everyday thing, of course.

At Starbucks, I was Sean.

Yet, something amazing happened junior year of high school. One of my friends started calling me “Kshit.” I thought it was just a light joke—after all, I had been called everything from Chi-chi to Seatej (by my soccer coach) over the years. This one didn’t go away after a good laugh though. It stuck. As high school wound down, I didn’t think much of it. A few friends to call me “Kshit”—so be it. Easier for them, easier for me.

That was all before the day I slipped up. As I was standing in the line for Subway, the guy behind the counter asked me my name. Just another mundane greeting. Grouped around all my friends, I blurted out, “Kshit.” I stuttered a bit, trying to take it back. Then, I saw a smile spread across his face.

I won’t forget that man. See you next week.”

That struck a chord. I won’t forget that. That’s it! My name. It was the secret sauce in my pitch. Every conversation ever—you’re pitching yourself to someone. I had the perfect opener. I could grab anyone’s attention with the shake of a hand and one word.

It got worse (er, better). The first couple days of Caltech when I first met my advisor, a Ph.D. in geology, he asked what my name was. Confidently, I replied, “Everyone calls me ‘Kshit.’”

With a knowing smile, he said, “If I can call you ‘Kshit,’ you can call me ‘Paul.’”

Caltech was the perfect way to start this anew. Besides some close friends, everyone here knows me as “Kshit.” It’s unique. It sticks. It’s a bit of a lesson in finding a silver lining. Maybe it even shows something about living life with a bit of levity. Stealing from Oscar Wilde, “Life is far too important a thing ever to talk seriously about.”

The name’s “Kshit.” I would tell you not to forget, but trust me, it ain’t easy.

Arca’s debut: a dizzying, visceral exploration of beauty and brutality

CRYSTAL LIANG
Contributing Writer

The world of electronic music has been abuzz with activity this autumn. Established names like Aphex Twin and Flying Lotus, as well as Radiohead’s Thom Yorke, dropped albums in the same week of late September. Christmas seemed to have come two months early for intelligent dance music (IDM) fans.

And now the Venezuelan electronic producer Arca, who initially drew attention through his collaborations with Kanye West and FKA Twigs, has burst onto the scene with his debut *Xen*, officially released on Nov. 4. While *Syro* showcased the refinement of Aphex Twin’s techniques, honed over the past couple of decades, *Xen* represents a step forward. It is very much an album of the 2010s with its bewildering sounds, fragmented track structure, and chaos which only occasionally condenses into coherency, similar to

Oneohtrix Point Never’s *R Plus Seven* of last year. The tracks on *Xen* evolve and effervesce, stutter and start anew primordially; machine-like and electronic as they are, there is something oddly biological about them.

The first track “Now You Know” begins with a shrill synth like bubbling acid; a metallic wind wails in the background. Enter the abrupt plucking of an Asian instrument, which sets off multiple layers of sound—arpeggiating synths which break off and restart, soft explosions like boulders being dropped into deep water, more synths that burst and blossom. The percussion is erratic, only loosely bringing the sounds together. Arca ornaments the track with samples of rattling, jingling, creaking, and, quite notably, synthesized pan flutes. The track as a whole evokes the image of the deep sea on some alien planet through which Arca is guiding us with a flashlight in hand, selectively illuminating strange creatures that lurk and pop out. At the end of the track, we hear the sounds of rushing, splashing water—we have surfaced. But what lies there?

As the album progresses, we hear further nuances and details of *Xen*’s soundscape, which is simultaneously frightening and wondrous. “Held Apart” features a familiar instrument, the piano, but it is rendered alien through excessive reverb. “Xen” begins with sharp, jittery synths like an assault,

foreshadowing the violent sounds that pervade the rest of the track: low-frequency oscillated sawing, snapping, chains, stamping, breaking glass. Near the end, synths repeat the same short melody like a canon or a cultish mantra.

In the next tracks, Arca conveys human emotions through alien and electronic sounds. We also get to hear some classical avant-garde influences, as some of these tracks might be considered minimalist if transcribed for analog instrumentation. The synth-laden “Sad B---” stumbles forward at first, but, once it finds its footing, it skitters and frolics with delight. “Sisters” features a

plays single notes dryly to the beat. Whether or not it works is a matter of subjective taste; it certainly catches the attention, however, in contrast to the other sounds, which are all heavily electronic. The tracks that follow, “Lonely Thugg” and “Fish,” are similarly dark but fall flat, lacking cohesion and direction. Yet, there are features of these tracks that should not go unmentioned. The intro to “Lonely Thugg,” for instance, fuzzes with what one could imagine as the murmurings of the subconscious, and “Fish” opens with soft, watery sounds juxtaposed with crackling, ripping noises which could trigger a frisson in some listeners.

“Wound” stands out on *Xen* in its purity and rawness of feeling, conveyed by an orchestra of staticky strings. The track is shamelessly cinematic; grief seeps out of the music like blood, and the sense of something perishing is compounded by the vocodered voice that drones listlessly over the instrumentals, as if wasting away. The next two tracks, “Bullet Chained” and “Tongue,” provide a jarring contrast as the most violent tracks on the album. If “Wound” is the death of some idealism or goodness, then “Bullet Chained” and “Tongue” are the nihilism that remains. They are largely devoid of melody, stripped of sentiment, featuring brutal noises like whips, clangy metal, and harsh scraping. The disintegration culminates in the last track “Promise,” which seems to depict a slow-motion apocalypse. Synths and strings drop like rain or falling meteors, followed by explosions and, at the very end, bright, ethereal sounds that signal hope and rebirth.

Xen is a work of striking contrasts: it is atavistic, yet futuristic; human, yet robotic; brutal and dark, yet beautiful. Impressively, Arca uses almost entirely electronic sounds to tap into something primal and visceral. There is a dream-like or perhaps nightmarish quality to the album in its fragmentation, vividness, and rare, fleeting vocal samplings, which resemble hypnagogic hallucinations. With this solid debut, Arca takes his place among current pioneering electronic artists like Oneohtrix Point Never, Tim Hecker, and Ben Frost, adding his own uniquely sensual and feverish style to the mix.

Favorites: “Now You Know,” “Sisters,” “Family Violence,” “Thievery,” “Wound”
Least favorites: “Lonely Thugg,” “Fish”
Overall rating: 4/5

“It is very much an album of the 2010s with its bewildering sounds, fragmented track structure, and chaos which only occasionally condenses into coherency...”

clangy tribal beat which accompanies two synths, perhaps the titular sisters, capering in a joyous counterpoint. “Slit Thru” is unsettling, dissonant—the percussion, which stamps and hiccups, combined with warbling synths, is reminiscent of classic IDM. Next is “Failed,” which seems to drag itself forward, downcast. Weepy synths doggedly play the same musical phrase over and over, while lower synths play chords that shade it with emotional depth. “Family Violence” would not sound out of place on a film soundtrack composed by Jonny Greenwood. Artificial-sounding strings play atonally in a way that goes nowhere, which steepes the track in tension. Two voices, perhaps those of the family, dominate: erratic, high-pitched violins seem to fight against cellos that hack relentlessly, but occasionally stagger off-tempo.

“Thievery” marks a transition from the emotional, exploratory nature of the previous tracks, setting a darker mood for the rest of the album. With a pounding reggaeton beat and urgent, passionate synths, it’s by far the most danceable track on *Xen*. The minor key of the synths, the samples of garbled voices, the pregnant pauses, the rumbling bass, and the cavernously echoing soundscape create a strongly nocturnal feel for the banger. Arca makes a somewhat dubious choice at the climax of the track, inserting a piano that

NOMINATE YOUR FAVORITE PROFESSOR FOR THE FEYNMAN TEACHING PRIZE!!!

Here’s your chance to nominate your favorite professor for the 2014-15 Richard P. Feynman Prize for Excellence in Teaching! You have from now until January 5, 2015 to submit your nomination package to the Provost’s Office to honor a professor who demonstrates, in the broadest sense, unusual ability, creativity, and innovation in undergraduate and graduate classroom or laboratory teaching.

The Feynman Prize is made possible through the generosity of Ione and Robert E. Paradise, with additional contributions from an anonymous local couple. Nominations for the Feynman Teaching Prize are welcome from faculty, students, postdoctoral scholars, staff, and alumni.

All professorial faculty of the Institute are eligible. The prize consists of a cash award of \$3,500, matched by an equivalent raise in the annual salary of the awardee. A letter of nomination and detailed supporting material, including, but not limited to, a curriculum vitae, course syllabus or description, and supporting recommendation letters should be emailed to kkerbs@caltech.edu or directed to the Feynman Prize Selection Committee, Office of the Provost, Mail Code 206-31, at the California Institute of Technology, Pasadena, California, 91125. Nomination packages are due by January 5, 2015.

Additional information including guidelines for the prize and FAQ may be found at <http://provost.caltech.edu/FeynmanTeachingPrize>. Further information can also be obtained from Karen Kerbs (626-395-6039; kkerbs@caltech.edu) in the Provost’s Office.

SPORTS

THE CALIFORNIA TECH

NOVEMBER 17, 2014 5

Much basketball. Very school spirit. Wow.

GOCALTECH.COM

Actual Sports Content Editor

PASADENA, Calif. (Nov. 15, 2014) – Senior Andrew Hogue (Arroyo Grande, Calif. / Arroyo Grande) and junior Kc Emezie (Waxhaw, N.C. / Marvin Ridge) delivered monstrous performances in the first annual “110 Freeway Rivalry” as the Caltech men’s basketball team went toe-to-toe with Occidental College in front of a raucous capacity crowd to open the season in the Braun Gymnasium on Saturday night.

“That’s the kind of atmosphere that is exhilarating to coach, play and be a fan in,” Head Coach Dr. Oliver Eslinger said. “We’re all very appreciative of our department and students for making it happen, and hopefully we can pack Braun Gym like that for every game.”

The Tigers pulled away late in the second half to claim a 90-81 victory and begin the season 1-0, while the Beavers start out 0-1.

Emzie drained a career-high 25 points on 9-of-15 shooting while adding seven rebounds and four assists. Hogue also set a new career mark with 16 rebounds and completed the double-double with 17 points while chipping in a team-high five assists and two steals.

“This was a great college basketball game,” Eslinger said. “Both teams made plays throughout, and I was proud of our preparation and team effort to the end.”

Caltech rode the deafening cheers of the crowd to a quick 11-4 start less than three minutes into the game as Hogue scored all 11 of the Beavers’ points via a trio of three-pointers and a coast-to-coast layup.

Occidental scored 10 unanswered points to take a 14-11 lead, but a pair of layups by sophomore Nick Buoniconti (Orlando, Fla. / Lake Highland Prep) gave the Beavers a one-point edge with 14:19 on the clock. The Tigers’ fast breaking style manufactured another eight straight points for a 22-18 lead, but an Emezie trey and layup on consecutive possessions handed Caltech another one-point margin.

Four consecutive threes saw Occidental climb to an 11-point lead, but a huge dunk on the fast break by sophomore Nasser Al-Rayes (Doha, Qatar / American School of Doha) silenced the Tigers fans on the far side of the stands. Oxy would extend the margin to as much as 14 at 47-33 with 2:23 to play in the half, but Caltech reclaimed the momentum heading into halftime, locking down on

defense to keep the Tigers scoreless while notching five more points before the break.

Oxy scored the first six points of the second half to take a game-high 15-point lead, but Caltech responded quickly behind a three-point play by sophomore Luke Lango (San Diego, Calif. / Pacific Ridge School) to make it 53-43 at the 16:52 mark. The Beavers soon cut the deficit back to single digits at 58-52 with just under 13 minutes left in the game and made their move five minutes later as Lango and sophomore David LeBaron (San Diego, Calif. / Francis Parker) hit back-to-back jumpers to pull within five points at 63-58.

The Tigers briefly regained some breathing room, but Emezie had an answer as he brought the Beavers within four at 69-65 with just a tick under six minutes left to play. The junior swingman stepped up

his game to score an incredible 14 points over the final seven minutes of the contest, but Oxy rained down a barrage of threes to outdistance Caltech in the final minutes and claim the first of three matchups between the rivals this season.

Lango also reached double figures in scoring with 10 points, while sophomore Lawrence Lee (Hong Kong / Hong Kong International School) made a team-high three steals. Freshman Ty Ochse (Tucson, Ariz. / Canyon Del Oro) also impressed in just eight minutes off the bench in his collegiate debut, sinking both his shots for four points and adding a rebound and steal.

“We will be using this as a springboard going forward in what should be a great season,” Eslinger said. “There was plenty to build on tonight.”



Ricketts House represents on the basketball team again. Gg Ty.
Photo Courtesy of Michael Wong



Andrew Hogue rocks the Halloween Oreo look to start the season.
Photo Courtesy of Michael Wong



Lawrence Lee reaches for the stars while David LeBaron watches in awe.
Photo Courtesy of Michael Wong

Look at these guys getting their SCIAC recognition on

GOCALTECH.COM

Actual Sports Content Editor

PASADENA, Calif. (Nov. 12, 2014) – Caltech men’s soccer senior Marec Serlin (Philadelphia, Pa. / Harriton) and sophomore John David Feist (Dallas, Texas / Jesuit College Prep) have been recognized by the SCIAC with the Brine Award of Distinction and Second Team All-Conference honors.

As a “true symbol of a SCIAC student-athlete,” Serlin led the team with four goals, eight points and 12 shots on goal this season while maintaining a 3.9 grade-point average in pursuit of a Bachelor of Science degree in physics. He was one of only two field players to start all 19 games this season, including the last four SCIAC matches in which he played through a broken hand.

The Brine Award is a well-rounded honor that takes into account sportsmanship, community service and academic success as well as performance on the soccer field. It is voted on by the league’s nine head coaches.

Serlin’s recognition marks a repeat for Caltech, as Thomas Kwok received the honor for the Beavers last year as well.

“Marec is a well-deserving winner of the SCIAC Brine Award,” Head Coach Rolando Uribe said. “This award has been



If you really want to see the ball in the picture, go to the website.

classroom and a great soccer player on the field. His improvement over his four years at Caltech has been awesome. He scored four of our six goals was in the top 17 in scoring in SCIAC, was a team captain for two years and played his last 4 SCIAC

matches with a broken hand. Marec inspired not only his teammates but also us on the coaching staff. His positive attitude, tremendous work rate and angry cheer before games

set a high standard for Caltech soccer players to follow.”

Feist was one of just two goalkeepers to make it onto an all-SCIAC team as he led the conference with 126 saves – 40 more than his nearest competitor – and recorded a .653 save percentage as the Beavers allowed over a full goal less per game than last year’s average. Feist is the first Caltech soccer player to earn All-Conference honors since 2012.

“JD had a fantastic year for us and is well deserving of being named All-SCIAC,” Uribe said. “I am very proud of the way he has matured not only as a soccer player but as a leader too as just a sophomore. He is a joy to watch in goal and having Nick as his goalkeeper coach helped him improve from last year.”

ANNOUNCEMENTS

6 NOVEMBER 17, 2014

THE CALIFORNIA TECH

ASCIT Minutes

ASCIT Board of Directors Meeting

Minutes for 13 November 2014. Taken by Sean McKenna

Officers Present: Nima Badizadegan, Connor Rosen, Connie Hsueh, Patrick Nikong, Annie Chen, Sean McKenna

Guests: Margaret Lee, Chris Dosen

Call to Order: 11:02 pm

President's Report (Cat):

- There will be interviews soon for the new DevTeam members. We will have recommendations for appointment by next week.
- Tom Mannion, the SAAC, and the Athletics Department are coordinating an event for this weekend to support student athletes and the Men's Basketball Team in their home-opener against Occidental. There will be a prize given to the house with the highest attendance.

Officer's Reports:

- **V.P. of Academic Affairs (ARC Chair: Nima):**
 - Cindy Weinstein, the Vice-Provost, is soliciting student feedback on TQFR reports. Any comments can be directed to Nima.
 - CS Option has found a chair for the Student-Faculty Conference
- **V.P. of Non-Academic Affairs (IHC Chair: Connor):**
 - Kristin Antelman, new head librarian, is working on a "maker space" in SFL which could have 3D printers, 3D scanners, and other such equipment. Anyone willing to work on a proposal for this or seeking further information should ask Connor
 - Meeting with the President to discuss the future of housing at Caltech (i.e. Bechtel Housing). Anyone with an opinion should talk to their House President.
 - IHC is investigating the disappearance of parking formerly used by undergrads near the North Houses
- **Director of Operations (Connie):**
 - The Tech will be holding internal training.
- **Treasurer (Patrick):**
 - Tom Mannion, the Alumni Association, and GSC have contributed money for Big I.
 - Patrick will send out an instruction email for reimbursements
- **Social Director (Annie):**
 - Annie needs volunteers for Big I on Saturday 22 November.
 - Big I wristbands for 21-plus will be distributed on Thursday.
 - Be a Kid Again and ASCIT Formal are being planned.
 - Caltech/Harvey Mudd party may happen again this year
- **Secretary (Sean):**
 - Nothing to report

REMINDER FROM THE COUNSELING CENTER:

Meditation Mob

(drop-in mindfulness meditation group)
meets every Tuesday
Bottom floor of Winnett
from 12:00-12:50 pm

CALTECH THEATER offers several chances to branch out and take chances, have fun and expand your social network this fall!

1. Wednesday Nights 730-930 in Ramo Auditorium.

Director of Theater Arts Caltech, Brian Brophy (*Star Trek TNG, Shawshank Redemption*) helps guide you through the fundamentals of Directing/Acting/Writing for the stage (life), to a final production of several ten-minute plays by students December 3, 2014. We still have room for about six more students! Last chance 2014!

2. WANTED: Actors, singers, musicians, technical personnel, and designers for new, original Caltech musical *Alice Through the Wormhole!* This musical is currently in the development phase with a world premiere run February 20-March 1 2015! If you are interested in any facet of production, including script development, contact Brian directly!

CALTECH-OCCIDENTAL CONCERT BAND



Do you know what Caltech group has performed at the Great Wall, Carnegie Hall, and Disney Hall, all in the last ten years? Or what ensemble boasts among its members or alumni the Project Scientist of the Spitzer Telescope, the chief engineer of the Mars Pathfinder flight system, the Deputy Director of the Interplanetary Network Directorate, and Niles Pierce. And, did you know that almost every concert features a guest conductor who is a esteemed Professor of Geology and Geochemistry.

If you guessed it's the Caltech – Occidental Concert Band, you guessed right. Last June, this amazing ensemble, operating under the rather large and impressive umbrella that is part of Caltech's Student Affairs, performed as the feature ensemble at an international music festival at Disney Hall.

You can hear this exciting group on Friday, November 21st, at 8:00 in Ramo Auditorium. This is a free concert!

Our guest conductor that evening will be Sharon Lavery. Sharon is the co-conductor of the USC Thornton School of Music Wind Ensemble. Also appearing that evening will be the Blair High School Band.

There will be music by Charles Ives, George Gershwin, Paul Hindemith, and Auturo Márquez.

Please come out and support your fellow students and faculty as they prove once again that life at Caltech is a fertile ground for many things, including the creative arts.

The Caltech-Occidental Concert Band will present their annual FREE fall concert in Ramo Auditorioum on Friday, November 21, at 8 p.m.

CORRECTION: For the AACIT Fabulous Flying Fair article that appeared in Issue 6, the correct contact information is David G. Werntz, dgwerntz@yahoo.com.

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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.

Letters and submissions are welcome; e-mail submissions to tech@caltech.edu as plain-text attachments, including the author's name, by Friday of the week before publication. *The Tech* does accept anonymous contributions under special circumstances. The editors reserve the right to edit and abridge all submissions for any reason. All written work remains property of its author.

The advertising deadline is 5 PM Friday; all advertising should be submitted electronically or as camera-ready art, but *The Tech* can also do simple typesetting and arrangement. All advertising inquiries should be directed to the business manager at tech@caltech.edu. For subscription information, please send mail to "Subscriptions."

FEATURE

THE CALIFORNIA TECH

NOVEMBER 17, 2014 7

Get Fit with Brad/Chad: Weightlifting 101

BRAD CHATTERGOON
Contributing Writer

Hey guys and girls. Welcome to week 8. Term's almost over, whoooo. Also, since I'm a senior now I can finally say that my weekend would definitely beat up your weekend in a fight. This weekend I saw Big Hero 6 (excellent movie by the way), went go-karting with my alley in Page (shout out to UCC and all-around awesome dude Chi Chi An!), spent some time checking out swords and samurai robes at LACMA, played squash with my advisor, and had leg day at the gym! Awww yeah being a senior feels good. Enough about me, though; this week's article is going to talk about getting into weightlifting for beginners, aka Weightlifting 101.

To start with, here are some weightlifting basics. There are six general muscle group categories:

- I. Chest
- II. Back
- III. Legs
- IV. Shoulders
- V. Biceps
- VI. Triceps
- VII. Abdominals
- VIII. Lower Leg/Calfes

The first four are the large muscle groups on the body and the latter four are comprised of much smaller muscles. There are two details to be mentioned from this information. The first is that exercises involving the larger muscle groups tend to be much more calorically intensive because the muscles doing work are much bigger and also can lift heavier loads. I'll just go ahead and talk to myself when I say, for the non-science among us, Work Done = Force x Distance Moved, where force is a function of how heavy a load you're moving. The second detail to mention is that these muscle group classifications allow us to talk about weightlifting "splits." The weightlifting split refers to how you segment your workout sessions according to muscle groups. Examples of splits

are: "full body," "back & biceps," "chest & back," "legs," etc.

The next bits of relevant terminology are "sets" and "reps." First, "rep" is short for repetition, which is the act of performing one weightlifting motion. Some number of reps together makes a set. For example a set can be a group of 10 reps performed without rest. In most cases, one performs several sets in one session. An example of how this would be applied is "3 sets of 12 reps" or 3x12. Sets and reps can be varied in a workout such as doing one set of 12 reps followed by another set of eight with a heavier weight or some variation like this. Sets are usually distinguished from each other by some form of rest period between them. A "superset" refers to doing two exercises back to back without a rest period and supersets are usually distinguished from each other again by a rest period. An analogy of this is that at Caltech we exercise our brains with 5 sets of 6 problems each, and supersets happen when we've got more than one due on the same day ... no it's not just you; that really was a terrible joke.

The last bit of terminology is the classification of "free weights" vs. "machines." Free weights are in general any type of exercise which uses equipment not somehow tethered in place or offering limited motion. These include barbells, dumbbells, cables, resistance bands, etc. Machines != free weights (or "≈" if you're more familiar with MATLAB). Machines have their usefulness but I'm personally a big fan of free weights, especially since they can perform compound movements, which we'll get into next week. They are also a more natural imitation of any weightlifting motion you might perform in real life.

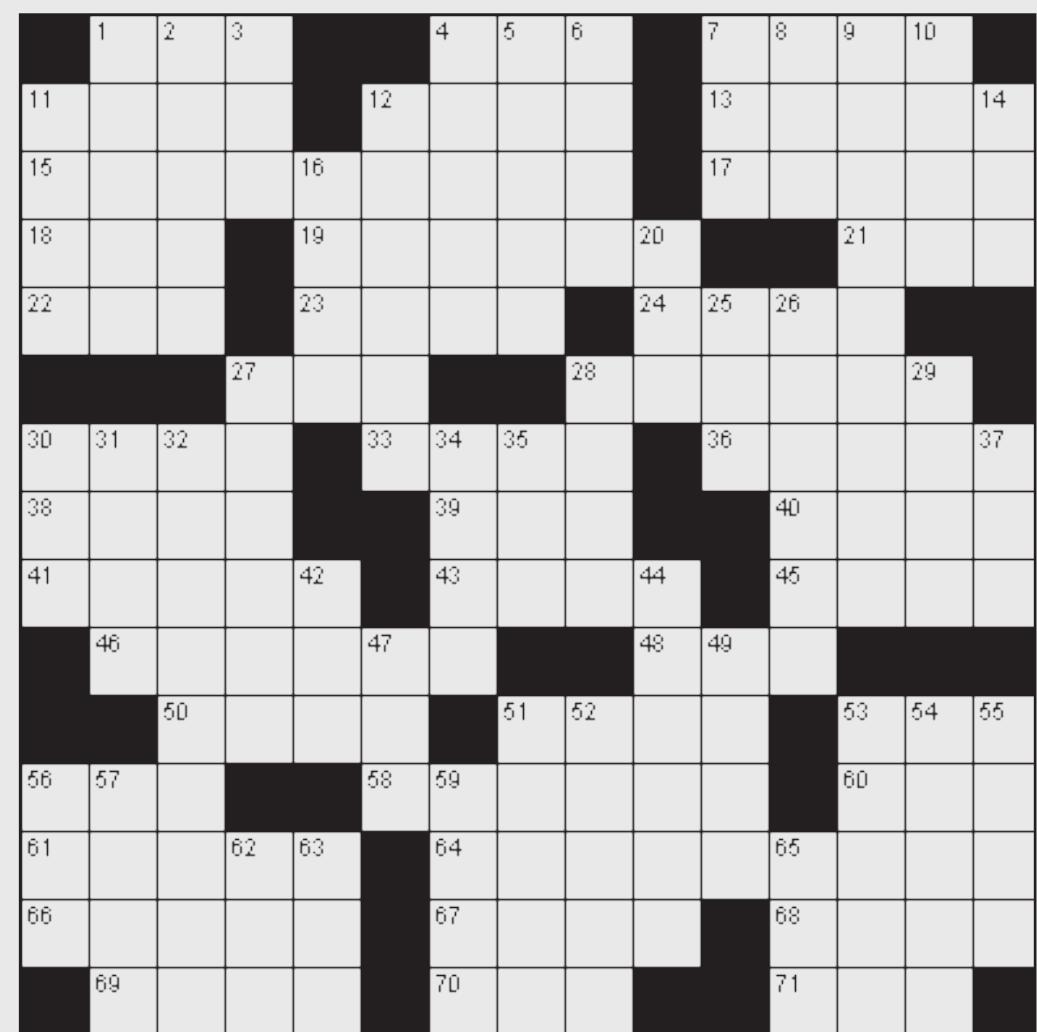
Hopefully this helps you decipher the conversations that you hear on the Jersey Shore. Remember to get your drop cards signed earlier rather than later!

Brad/Chad



Brad/Chad is a big fan of free weights, as opposed to exercises using machines.
<http://upload.wikimedia.org>

Crossword



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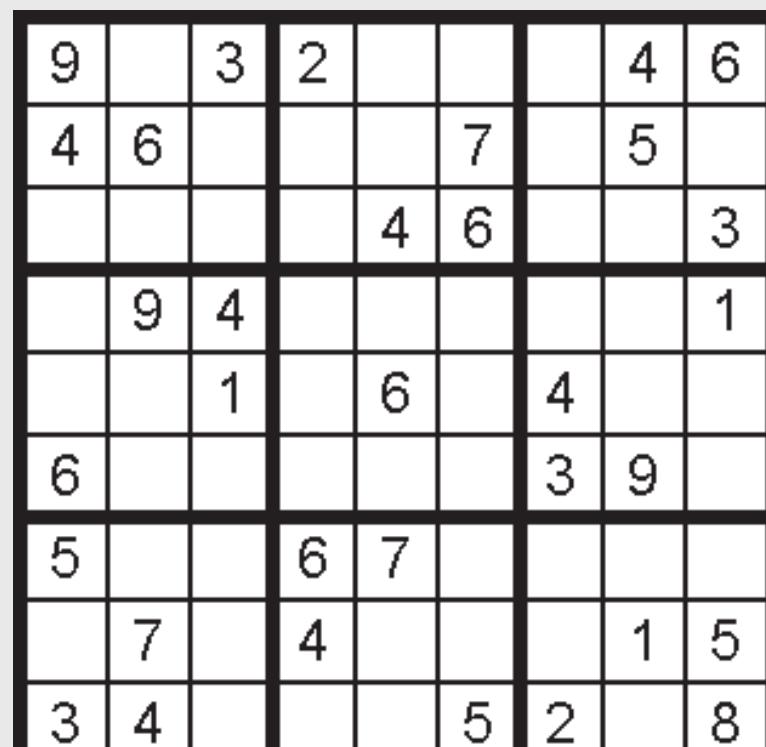
Across

- 1. Soft surface texture
- 4. Small viper
- 7. Stop
- 11. Cuban currency
- 12. Singing voice
- 13. Assumed name
- 15. Egg-laying
- 17. Paris transport system
- 18. Guided
- 19. Promptly
- 21. Tool used to cut gears
- 22. Metal-bearing mineral
- 23. Delicate
- 24. Desperate
- 27. Elfin
- 28. Niche
- 30. Region
- 33. Seep
- 36. Call forth
- 38. Adjacent
- 39. Sign of assent
- 40. Portent
- 41. Luxury watercraft
- 43. Weaving machine
- 45. Salacious
- 46. Permissible difference
- 48. Astern
- 50. Bow
- 51. Champion
- 53. Append
- 56. Apposite
- 58. Rough shelter
- 60. Charge for professional services
- 61. Water nymph
- 64. Marked by care and persistent effort
- 66. Rhetorical device
- 67. Stupefy
- 68. Item of footwear
- 69. Was cognizant or aware
- 70. Golf peg
- 71. Consumed

Down

- 1. Not at any time
- 2. Stage whisper
- 3. Fizzy soft drink
- 4. Distant in manner
- 5. Feat to attract attention
- 6. Assigned position
- 7. Amateur radio operator
- 8. Beer
- 9. Supple
- 10. Tropical starchy tuberous root
- 11. Field sport
- 12. Stream or brook
- 14. Weep
- 16. Part of a church
- 20. Poem
- 25. Frozen water
- 26. Rebellion
- 27. Sire
- 28. Remake
- 29. Turn or place at an angle
- 30. One, some, every or all
- 31. Actual
- 32. Deliberate act of omission
- 34. Merely
- 35. Menagerie
- 37. Conclude
- 42. Number in a brace
- 44. Swallow
- 49. Nutrition
- 51. Hurry
- 52. Result
- 53. Currently in progress
- 54. Tie in tennis
- 55. Writing table
- 56. Colony insect
- 57. Open land for recreational use
- 59. Compass direction
- 62. Simian
- 63. Condensation
- 65. Country, initially

Sudoku



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HUMOR

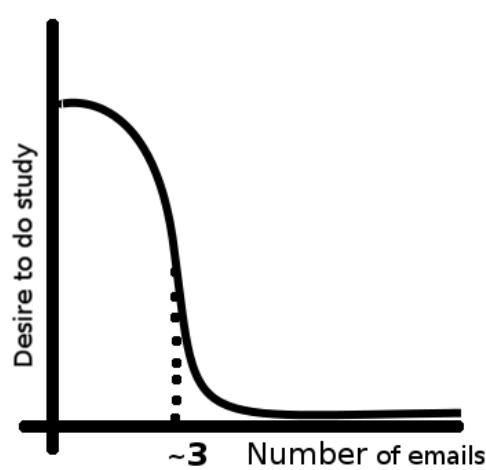
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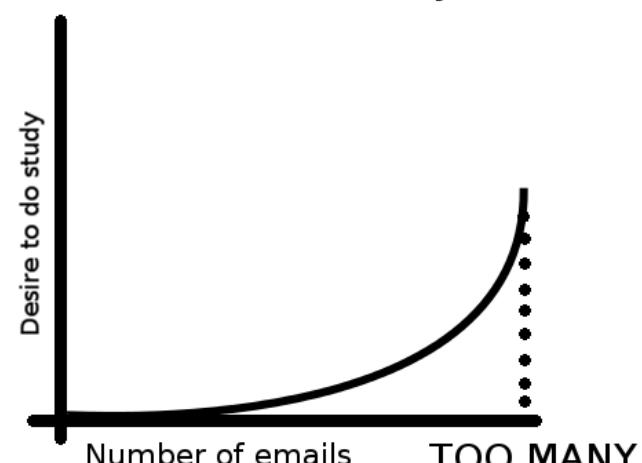
SMBI Imitation Week

Georgio Kraggman

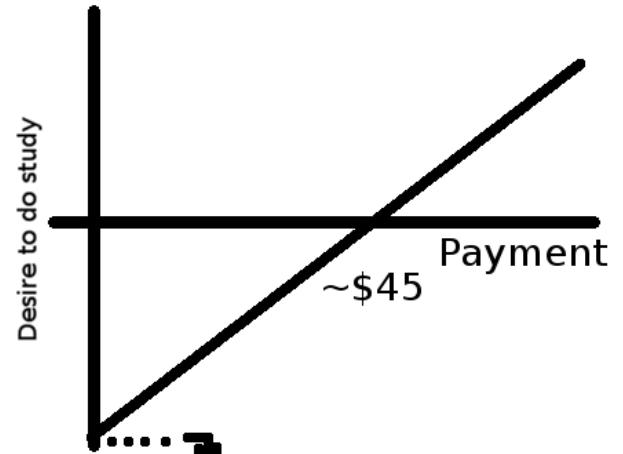
What I claim it is



What I assume they think

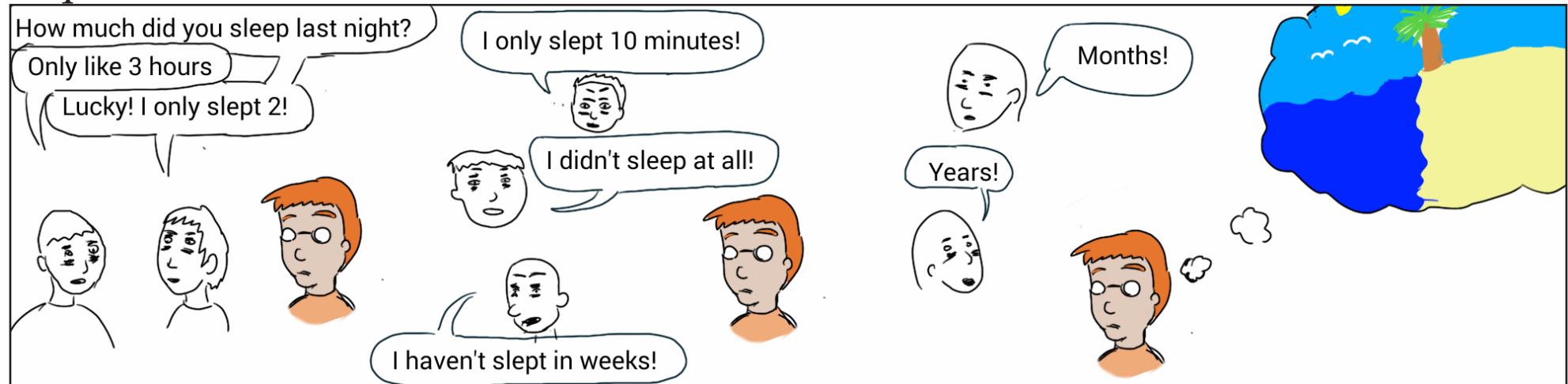


What really matters



*: Note that the utility gain from screwing over survey grows exponentially with number of emails they send (= perceived desperation).

Acquired Taste



Answers to previous crossword

P	A	U	S	E	A	G	O	G	C	A	S	H
O	R	G	A	N	L	A	C	E	O	B	O	E
R	E	L	I	C	L	I	E	N	G	U	L	F
T	A	I	L	O	R	N	A	I	F	S	A	T
B	E	N	E	A	I	D	E	A	N	U	R	S
F	L	A	G		C	L	A	M	T	A	S	T
O	U	R			H	A	V	E	N	P	E	W
G	E	N	U	S	S	O	L	O	T	U	N	E
S	T	R	A	N	G	E	N	E	A	R	N	E
E	R	A			G	O	N	G	S	C	R	U
V	A	N	E		I	D	O	L	T	E	N	O
E	D	G	E		S	U	R	E	U	N	D	U
R	E	E	L		M	E	E	T	E	S	T	O

Answers to previous Sudoku

7	6	9	5	1	8	4	3	2
5	1	3	6	4	2	8	9	7
8	2	4	9	7	3	6	1	5
2	5	8	1	3	9	7	4	6
4	9	6	8	5	7	3	2	1
1	3	7	2	6	4	9	5	8
9	4	1	7	2	6	5	8	3
3	7	2	4	8	5	1	6	9
6	8	5	3	9	1	2	7	4

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