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TECH@CALTECH.EDU

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## Nature or Nurture? Innate Social Behaviors in the Mouse Brain

LORI DAJOSE  
Caltech Media Relations

*This article is adapted from a story that was originally published online at caltech.edu.*

Caltech neuroscientists image activity deep in the brain while mice engage in fighting and mating

Adult male mice have a simple repertoire of innate, or instinctive, social behaviors: When encountering a female, a male mouse will try to mate with it, and when encountering another male, the mouse will attack. The animals do not have to be taught to perform these behaviors. This has led to the widespread presumption among neuroscientists that the brain circuits mediating these behaviors are "hardwired," meaning that they are genetically encoded pathways with little flexibility.

But new research from Caltech neuroscientists shows that these behaviors and the neurons that represent them are not as fixed as previously believed.

The work appears in a paper in the October 19 issue of the journal *Nature*, and was led by David Anderson—Seymour Benzer Professor of Biology; Tianqiao and Chrissy Chen Institute for Neuroscience Leadership Chair; Howard Hughes Medical Institute Investigator; and director of the Tianqiao and Chrissy Chen Institute for Neuroscience.

The team used mice that had been genetically engineered so that neurons in a specific part of the brain involved in aggression and sexual behavior—the ventromedial hypothalamus (VMH)—would glow green when activated. To visualize this activation, a needle-thin glass lens was inserted into the hypothalamus, and images of flashing neurons were recorded by a miniature, portable microscope attached to the mouse's head. This brain imaging technology was originally developed by Anderson's collaborator at Stanford University, Mark Schnitzer, and obtained through Inscopix.

The Caltech team first set up "resident/intruder tests," in which they imaged the brain of a socially and sexually experienced "resident" mouse in its cage as a single intruder mouse—either a male or a female—was introduced. The researchers found that during its encounters with other mice, one of two distinct sets of neurons in the VMH were activated—one set if the other mouse was a male,

and another if it was a female. Though these neurons are spatially intermingled, there is very little overlap between them, like grains of salt and pepper interspersed on a plate.

Just by looking at the activation of these two neural populations, the scientists could reliably determine whether an animal was interacting with a male or a female. These observations seemed to support the idea that these distinct representations of males versus females are hardwired and genetically fixed from birth.

To test this idea more directly, the researchers examined the behaviors of naïve mice—those that had been maintained in isolation since weaning, without any social or sexual experience. If the sex distinction was indeed hardwired, then the researchers should have seen the separate activation of the groups of neurons specific for recognizing males versus females, even during the first encounters between these naïve mice and other male or female intruder mice.

Surprisingly, to the contrary, the neurons of these naïve mice initially were similarly activated when the mice were exposed to either male or female mice. At the same time, these mice initially exhibited little fighting (with males) or mating (with females) behaviors. Only after repeated social experience—contact with either male or female mice for two minutes, five times a day, for three days—did the separate sets of neurons representing male versus female mice appear. This separation occurred just as the mice began to exhibit aggression toward males and mating with females.

Further studies indicated that social experience with a female seemed to be the key requirement for the mice to develop separate, sex-specific populations of neurons, as well as aggressive behavior. As little as 30 minutes of social interaction with a female, the team found, was enough to make naïve mice aggressive towards males 24 hours later, as well as to cause the separation of male- versus female-specific representations in the mouse's brain. Naïve mice that were exposed only to males did not develop aggressive behaviors, nor did they show this separation.

"The mice do not have sex-specific neurons from birth," says co-first author Ryan Remedios, postdoctoral scholar in biology

## Welcome Frosh!

KAVYA SREEDHAR  
Contributing Writer

Hi frosh,

Congrats on surviving the prefrosh era, and welcome to Caltech! Hope rotation treated you all well, and everyone's settled in their houses :)

I'm Kavya, an EE junior in Avery/Moore. I'm also the chair of the Academics and Research Committee (ARC) this year. The ARC is the academic branch of student government, and we work to improve your academic and research experience at Caltech by hosting various seminars and programs as well as working with profs and admin on various policies. Our goal is to be a resource for all of you and to be an effective liaison between students and faculty.

However, the purpose of this letter isn't to tell you about the ARC (although if you're interested in learning more, check out [arc.caltech.edu](http://arc.caltech.edu) or come talk to me/any ARC rep). It's more of a way for me to \*slightly\* procrastinate on my sets and give you useful advice like

Don't procrastinate on your sets  
Ignore 1. and write a Tech Article instead :P

Just kidding, do your sets, but also take the time to explore and have fun!

Going off of 3, you get two terms where all your classes are on pass/fail at Caltech. Pass/fail is amazing because it gives you the time to get used to Caltech and figure out what you can and want to balance. Take these two terms to figure out where you like to work (the subbasement of Moore is a place :P), when you study well (3pm or 3am?), what study group you like, and what workload you can handle.

Aside from academics, take this time to try out the juggling club, check out interhouse games, consider joining a chamber group, play Mafia in the SAC, and in general, make friends and stay open-minded to trying new things. There are so many opportunities academically and otherwise here at Caltech, and you never know what you might find that you really enjoy. Perhaps you'll even get a chance to go off campus further than Lake and confirm rumors that an outside world exists.

One thing I've found is that the people at Caltech are really cool. I definitely encourage all of you to try to branch out as much as you're comfortable with and talk to and get to know people in your class. The beauty of being at such a small school is that the 236 faces that were unfamiliar at frosh camp become familiar pretty fast, and you can make some really great friends :)

Most importantly, as cliché as it sounds, make sure you enjoy what you're doing and have fun! If work ever seems like too much, just remember that everyone else is in core with you and can help - you're all in this together. Upperclassmen are also here for you and we all went through frosh year too. We can help with homework, show you how to do laundry, teach you how to cook (though if you're asking me for help, it depends on your definition on what food is...), and of course just listen and talk :)

So good luck, frosh, with your time at Caltech, and hope you had fun reading!

Cheers,  
Kavya

P.S. If you're interested in what the ARC does, our meetings are Sundays at 11am in a SAC study room and open to everyone! You can also check out our website at [arc.caltech.edu](http://arc.caltech.edu), and feel free to talk to any ARC rep (roster + emails on the website).

P.P.S. The Ph11 Hurdle is due 10/23/17 and you should do it! You should have received an email with more information + the hurdle and feel free to ask me or any Ph11 alum any questions :)

and biological engineering. "The separation forms as a consequence of social experience, specifically from social experience with a female."

"This is an unexpected discovery," says co-first author Ann Kennedy, a Caltech postdoctoral scholar in biology and biological engineering. "This area of the brain, the ventromedial hypothalamus, is a primitive, ancient region. We used to think of it as the basement of the brain, more like a plumbing system than a computer. Our study shows that this region exhibits plasticity and computation."

"This is basic neuroscience research," says Anderson. "We are studying the nature versus nurture problem: how much of the brain's wiring and the animal's behavior is determined by genetics versus experience. These results reveal that even the circuitry for supposedly innate behaviors is not as hardwired as previously thought. This finding raises a whole new set of questions about how

exactly social interactions with female mice can cause a change in patterns of brain activity and promote aggressiveness."

"The fact that there is a very close anatomical relationship between cells encoding sex and aggression is biologically very important because these primitive behaviors are essential for survival," Anderson adds. "It also raises the question of whether people that exhibit violent sexual behavior are somehow 'getting their neural wires crossed.' If this were true, then someday we might be able to treat someone who's a habitual violent sexual offender by functionally disentangling their neurons. But this is currently just an idea, and any therapies based on this research are a long way off."

The paper is titled "Social behaviour shapes hypothalamic neural ensemble representations of conspecific sex." Other co-authors include Caltech postdoctoral scholar Moriel Zelikowsky and Benjamin Grewe of the

University of Zurich. Funding was from the National Institutes of Health, the Gordon and Betty Moore Foundation, the Ellison Medical Foundation, the Simons Foundation, the Harry Frank Guggenheim Foundation, the Helen Hay Whitney Foundation, the National Science Foundation, and L'Oréal USA For Women in Science.

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# ANNOUNCEMENTS

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OCTOBER 23, 2017

THE CALIFORNIA TECH

## Caltech Y Column

### CALTECH Y

The Caltech Y Column serves to inform students of upcoming events and volunteer opportunities. The list is compiled by Katherine Guo 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

##### Pinnacles National Park Camping Trip

October 13th - 15th | Sign up at the Caltech Y | Cost \$85 due on sign up

Do you want to traverse rocky terrain to high peaks and through deep caves? Come along on a camping trip to Pinnacles National Park with the Caltech Y! Pinnacles was born from a lava field split by the San Andreas Fault, and thus supports diverse terrain and wildlife. We'll be completing a 9-mile loop around the park to High Peaks and Balconies Cave, as well as a shorter stint to Bear Gulch Reservoir. The trip departs Friday, October 13th at 1pm and returns Sunday, October 15 by 8pm. Transportation, campsites, and most meals are included. All experience levels are welcome. For more information on Pinnacles National Park, visit the National Park website at <https://www.nps.gov/pinn/index.htm>.

To secure your spot on this trip you must sign up and pay the fee (\$85) in person at the Caltech Y (505 S. Wilson the house, just north of the Credit Union). Spaces are limited. Priority may be given to those who can share in the driving.

##### Kids Reading to Succeed

Saturday | October 7th | 8:30 - 11:00 AM | 500 E. Villa Street & Jackson Elementary

Kids Reading to Succeed (KRS) works with the youth of Pasadena to encourage a love of reading and to improve literacy skills. The first hour (9:00 to 10:00) focuses on individualized and targeted reading, in which a volunteer is paired with a student who is encouraged to read aloud from a book chosen from the KRS library. Volunteers consistently ask questions of the students to gauge reading comprehension. The second hour of our program (10:00 to 11:00) is the interactive and fun presentation based on the monthly theme.

For more info and to RSVP go to <http://www.kidsreadingtosucceed.org/p/get-involved.html>. Eligible for Federal Work Study. Contact the Caltech Y at [caltechy@caltech.edu](mailto:caltechy@caltech.edu) or Kavya Sreedhar at [ksreedha@caltech.edu](mailto:ksreedha@caltech.edu) for questions.

##### Caltech Y Washington DC Science Policy Trip

December 10th - 14th | Applications due, October 24th

Cost is \$525 (with round-trip flight to DC and back to LA) or \$325 (with one-way flight to DC - go your own way at the end) or \$150 (no travel – join us in DC)

Join us for an exploration into Science Policy in the nation's capital! Our five day trip includes lodging and most meals; flights – if you choose; educational discussion

sessions, and of course the opportunity to see Washington, DC landmarks like the White House, the Memorials; Smithsonian Museums; the National Archives; and the Capital. Discussion sessions include those who have played a role in setting and implementing science policy for the United States including: Academics, Lobbyists, Scientists, Politicians, and Caltech Alumni. Past figures included: Vice President Gore's Science Advisor, Science Advisor to Secretaries of State Clinton and Kerry, the Director of DARPA, the Director of the NSF, one of the Directors at the NIH, science advisors at the White House Office OSTP, and more. Don't miss this opportunity!

The Washington, DC Science Policy Trip is coordinated by the Caltech Y with generous support from the George Housner Fund. Questions and applications may be directed to [caltechy@caltech.edu](mailto:caltechy@caltech.edu). Please visit: [https://www.caltechy.org/programs\\_services/areas/dc/](https://www.caltechy.org/programs_services/areas/dc/) for more info and applications.

##### Rise Tutoring Program

Monday - Thursday | 4:00 - 6:00 PM | Chandler Cafeteria

The Caltech Y Rise Program is currently accepting new tutors for the fall term. The Rise Program is an afterschool math and science tutoring program for public school students between grades 8 and 12. The program is in its twelfth year and helps students who are struggling in math or science (getting a C or below). The tutoring takes place on the Caltech campus Monday-Thursday from 4pm-6pm. Tutors work with 1-2 students and when possible work with the same student(s) throughout the year. The program is designed to help students gain greater competency in math foundations, improve skills in math and science and prepare students for college-level math and science.

Tutoring with the Rise Program is a great way to give back to the community and work with local school students to help them succeed in math and science. For more info and to apply go to [https://caltechy.org/programs\\_services/tutoring/Resources/index.php](https://caltechy.org/programs_services/tutoring/Resources/index.php).

##### Hathaway Sycamores

Every Monday | 5:45 - 8:00 PM | 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 40 minutes of travel time and 1.5 hours of tutoring. Transportation is included.

For more info and to RSVP email Elisabeth at [egallmei@caltech.edu](mailto:egallmei@caltech.edu). Eligible for Federal Work Study.

##### Beyond the Y

Join STARS in PUSD Resource Centers

STARS (Scholars Transitioning and Realizing Success) needs volunteers for Foster Resource Centers in four Pasadena Unified School District schools to strengthen students' educational success and provide them with access to foster youth resources. The drop-in Centers are currently open one day per week for 30 to 90 minutes. Volunteers will assist by leading activities such as cooking or community building games; making presentations on careers or other topics of interest; helping students complete homework or college essays and forms; or assisting staff with College Information Days. To volunteer, contact:

[inbox@fostercareproject.org](mailto:inbox@fostercareproject.org).

## Caltechlive!

### EARNEST C. WATSON LECTURE SERIES

Wednesday, November 1, 2017 • 8 PM

#### Going Out in a Blaze of Glory: Cassini Mission High



Linda J. Spilker,  
Cassini Mission, Project Scientist,  
Jet Propulsion Laboratory

Cassini mission's voyage of discovery revolutionized our understanding of Saturn, including where we might find life in our own solar system and beyond.

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If you are prepared for a comedic adventure through the worlds of Dungeons & Dragons...

## ENTER THE FANTASY OPEN AUDITIONS

Saturday, October 7  
11 am - 5 pm at Ramo Auditorium

# Dougbox Pizzeria Review

**CECELIA LU**  
Contributing Writer

If you are an Angelino, you will quickly realize that their pizzas pies are all named after popular streets in East L.A and Downtown Area. I've first discovered Dough Box Pizza and Bread sometime last year when I got hit with a major pizza pang (no surprise there). I still remember the first bite I took of "The York"- crunchy, buttery, flavorful, and absolutely delicious. The most impressive thing about their pies was the crust; it did not break apart or crumble after one bite and another. Instead, it remained intact and

unblemished despite it being attacked by my enthusiastic chomps. Don't tell anyone, but I've discovered where the Pizza Engineers live.

The idea of creating pizza pies began at their old job at a baking company. That was where Alexandra (aka Alex) and Tony first met. She was the barista and he was the pastry chef; little did they know they were going to be business partners someday. With Tony's baking skills and Alex's creative ideas, it didn't take long for them to mesh those qualities together to craft the perfect pizza pies. In 2016, they launched Dough Box Pizza and Bread with huge success.

Alex and Tony want to offer pizzas that you've never had before. It is exclusive as limited amount is sold per day. And guys, they sell out fast so it means they are doing something right. The duo strives in making everything fresh and with top quality ingredients. Their tomato sauce is strictly just tomatoes and tomatoes only. Yes- that means no salt, sugar, pepper, or seasonings are added in. All vegetables are roasted in the oven and sausages are picked up right before they open. They keep things minimal with a gust of flavors and crunch. The quality of their pizzas is a reflection of their passion

and love of their profession. I can easily attest that.

Here's a tip: place your order by email prior to when they open or a couple days early to ensure that you get one of their pizza pies. Their pizza pies take about 30 minutes to bake in the oven. However, there are regular pan crust pizzas for those who want to skip the waiting. Alternatively, if it is a Tuesday/Wednesday, you can opt to get their thin crusts! Although their pizza pies are the most popular, they have different crusts to accommodate all types.



Top left: slice of Dougbox pizza  
Top right: Dougbox Pizzeria  
Bottom left: Dougbox pizza pies  
Bottom right: Dougbox menu

Photos courtesy of Cecilia Lu

PIZZA PIES!	(45-60min)	DRINKS!	SIZES
- THE SOTO MOZZARELLA		- TOPO CHICO \$2	6" DEEP DISH \$10
- THE MAIN RICOTTA, SAUSAGE		- MEXICAN COKE \$2	9" DEEP DISH \$15
- THE YORK PEPPERONI, SAUSAGE		- SANGRIA SEÑORIAL \$2	12" DEEP DISH \$20
- THE BOYLE PEPPERONI			12" PAN PIZZA \$15
- THE HILL GARLIC, SPINACH, RICOTTA, SAUSAGE			*additional*
- THE ALAMEDA GARLIC, SPINACH, RICOTTA			MEAT \$2
- THE GRIFFIN MOZZARELLA, ROMANO, RICOTTA			VEGGIE \$1.50
- THE SPRING MUSHROOM, ONION, OLIVE, BELL PEPS			CHEESE \$2
- THE GRAND MUSHROOM, ONION, SAUSAGE			
- THE BROADWAY ONION, OLIVE, CHERRY PEPPERS, SAUSAGE*			
- THE FIGUEROA PEPPERONI, ONION, CHERRY PEPPER*			
- THE FOREST RICOTTA, GARLIC, ONION, CHERRY PEPPER*			
- THE EASTERN SAUSAGE, BELL PEPS, ONION			
- * Spicy			
		DESSERT!	
		HOUSE-MADE BRIOCHE BUNS	
		- SWEET HONEY GLAZED, \$1.50 ea	
		- CHOCOLATE FILLING	

## Procrastination workshop

A 1-hour workshop offered 2 times this term:

**Friday, October 13th, 4:00 - 5:00**

**Friday, November 3rd, 4:00 - 5:00**

**326 Sherman Fairchild Library**

- Learn tools for coping with procrastination and work avoidance.
- Learn practical, behavioral strategies for responding differently to old habits.
- Respond differently to unhelpful thoughts like "I can just get up early and do this tomorrow."
- Optional text-based reminder system to keep the lessons fresh in the week after the workshop is over!

**More information:** [counseling.caltech.edu](http://counseling.caltech.edu)

## EMOTIONAL INTELLIGENCE TOOLKIT

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### Emotional Awareness

Get better at knowing what you're feeling, and see how your thoughts and feelings affect each other. **October 9th and 16th**

### Open-Mindedness

Learn how to be more flexible in the way you see the world! **October 23rd and 30th**

### Face The Fear

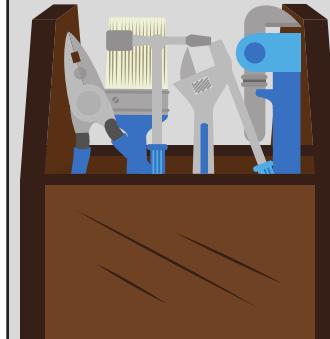
Learn how to hang in there with difficult situations and emotions without having to avoid them. **November 6th and 13th**

**Just show up!**

**Mondays 4:00 - 5:00**

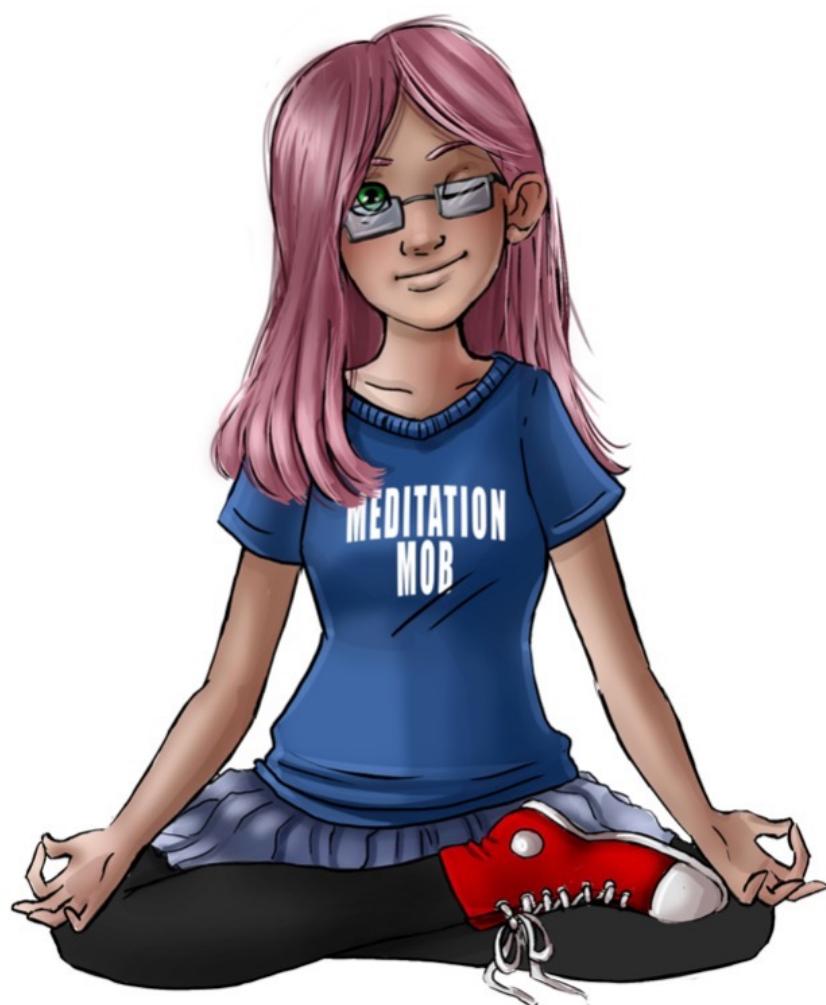
**326 Sherman Fairchild Library**

[counseling.caltech.edu](http://counseling.caltech.edu)



## Join the Meditation Mob!

**Tuesdays, 12:00 - 12:50**



Want to learn more about mindfulness meditation? It's a great way to improve your attention and to become more grounded in the present moment.

There's no religious component. We use secular, evidence-based meditation techniques.

We meet in the study room on the **9th floor of Millikan Library**. All students are welcome, from total beginners to experienced meditators.

Mailing list and MP3 archive:  
[counseling.caltech.edu/students/meditation](http://counseling.caltech.edu/students/meditation)

## Women's Soccer Wraps First Season in Exciting Fashion

GOCALTECH.COM  
Actual Sports Content Editor

PASADENA (Oct. 22, 2017) – A spurt of early second half goals caused the Caltech women's soccer team to give visiting Claremont-Mudd-Scripps Colleges a scare in the 2017 season finale on Sunday.

On the heels of a decent first half in which Caltech surrendered two tough goals to the Athenas, the Beavers brought an immediate energy to the second half and got on the board thanks in part to two very different scoring plays. First, senior Caroline Atyeo (Parkland, Fla. / Marjory Stoneman Douglas), in her final game in a Caltech uniform found a lane for freshman Netra Ravishankar (Fremont, Calif. / American) to bury a short range shot into the right side of the net in the 48th minute. Just over three minutes later, sophomore Noelle Davis (Fort Worth, Texas / Texas Acad. of Math & Science) put pressure on the CMS goalkeeper and following a defensive gaff from the Athenas, Davis retook possession and followed the ball into the net to knot the game at two and breathe life and hope into the Beavers.

Freshman goalkeeper Kali Drango (Lake Oswego, Ore. / Lake Oswego) kept the Beavers



*Maybe one day she will catch up to the elusive ball.*

-gocaltech.com

in the game late with six saves in the face of a strong, steady CMS attack. The Athenas' deep squad ultimately proved to be too much for Head Coach Taylor Houck's young team to overcome but the Beavers' tenacity and ability

to respond early in the second half speaks volumes about the team's current standing.

"The work ethic of this group has shown up on the field often this season and particularly in the second half of today's

game," Houck said. "There is no quit in this team and as we grow together and begin to build on our experience and chemistry the end results should start to turn in our favor."

Ravishankar, along with fellow freshman Krystin Brown (Lake Forest, Calif. / Trabuco Hills) led the team with five goals and each scored the first two in team history in the team's trip to Alvernia University last month.

Caltech women's soccer wrapped its first season with two victories, both of which came in two different varieties. Another strong recruiting class could have the upstart Beavers in a position to contend for at least one SCIAC victory in its sophomore season as a program.

## Volleyball Pushes Sagehens at Home

GOCALTECH.COM  
Actual Sports Content Editor

PASADENA (Oct. 20, 2017) – The Caltech women's volleyball team came within at least five points on three occasions of taking a set from visiting Pomona-Pitzer Colleges on Friday evening.

The Beavers found success consistently throughout the match and maintained a steady scoring pace against the 8-17 Sagehens. Freshman Krystyna Maruszko (Redondo Beach, Calif. / Marymount) had her best moments in the first and seconds sets when she contributed four kills in each segment. Her first kill came on the tail end of the Beavers' 4-0 to kick off the match. The freshman also had her only solo block in the midst of a 3-0 Beavers run towards the end of the first set to bring the score to 20-19. A kill from junior Sakthi Vetrivel (Redmond, Wash. / Overlake School) which came on a feed from Maruszko knotted the set up at 23 before the visitors pulled away.

The second set featured a 5-1 run in the middle of the set to keep Caltech's hopes



*Number 3 does not look ready to block that ball.*

-gocaltech.com

afloat. Maruszko had one of her eight kills during this time just before connecting with sophomore Lauren Li (Bellaire, Texas /

Bellaire) on a successful kill. Li finished the match with five kills and eight digs.

Though trailing by two sets, the Beavers made sure not to go quietly. Caltech put together another 23 point set, led by sophomore Alexa Lauinger (Ortonville, Mich. / Brandon), who led the Beavers with nine kills and 13 digs. Four of her nine kills came in the third set. The Beavers hit their stride late in the set when they weaved together a four-point run where three of the points came on Vetrivel's serve. All of those points came on attacking errors from the visitors, fueling the team's desire to extend points late in the match. Also noteworthy, freshman Isabell Yang (Arcadia, Calif. / Arcadia) had the most single-match digs of her career, leading the home team with 17 digs.

Head Coach Tom Gardner and the Beavers will take a short trip down the 210 when they visit Occidental College on Saturday, Oct. 21 at 2 p.m.

## Como, Lettenberger stop 12 in Sagehens Visit

GOCALTECH.COM  
Actual Sports Content Editor

PASADENA (Oct. 22, 2017) – Caltech goalkeepers freshman Joe Como (Glen Cove, N.Y. / Friends Acad.) and sophomore Alex Lettenberger (Glen Ellyn, Ill. / Glenbard West) combined for 12 saves in Saturday's match against SCIAC foe Pomona-Pitzer Colleges.

Como got the start and played the game's first 62 minutes and stopped eight shots himself behind the young, athletic Caltech defense. Lettenberger relieved Como with 28 minutes to go and filled in admirably, saving all four shots he faced.



*This looks like the poster for an inspirational sports movie.*

-gocaltech.com

Sophomore forward Kevin Yu (Park Ridge, N.J. / Park Ridge) put the Beavers only two shots on target within one minute of one another. The first shot came 81 minutes in and the second shot came 53 seconds later following a Sagehens foul while recovering from a Caltech corner kick.

Head Coach Phil Murray and the Beavers will play their remaining two games at home. The first game will be on Wednesday, Oct. 25 when they host SCIAC-rival Occidental College and will wrap 2017 when they take on Bethesda University Flames on Saturday, Oct. 28.

# ANNOUNCEMENTS

THE CALIFORNIA TECH

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

Here's your chance to nominate your favorite professor for the 2017-18 Richard P. Feynman Prize for Excellence in Teaching!

You have from now until December 15, 2017 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](mailto: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 December 15, 2017.

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](mailto:kkerbs@caltech.edu)) in the Provost's Office.

## VICE PROVOST OFFICE HOURS

VICE PROVOST, CHIEF DIVERSITY OFFICER, AND PROFESSOR OF ENGLISH CINDY WEINSTEIN HOLDS REGULAR OFFICE HOURS AS AN OPPORTUNITY FOR UNDERGRADUATE STUDENTS, GRADUATE STUDENTS, AND POSTDOCS TO MEET FOR DISCUSSIONS PERTAINING TO THE COUNCIL ON UNDERGRADUATE EDUCATION; CALTECH ACCREDITATION; THE STAFF AND FACULTY CONSULTATION CENTER; STUDENT-FACULTY PROGRAMS; THE CENTER FOR TEACHING, LEARNING AND OUTREACH; THE CALTECH DIVERSITY CENTER; AND THE CALTECH LIBRARIES.

THERE ARE FOUR 15-MINUTE APPOINTMENTS AVAILABLE PER OFFICE HOUR. SIGN UP IN THE OFFICE OF THE VICE PROVOST, PARSONS-GATES ROOM 104, EXT. 6339 OR BY SENDING AN EMAIL TO [DLEWIS@CALTECH.EDU](mailto:DLEWIS@CALTECH.EDU). WE LOOK FORWARD TO HEARING FROM YOU!

## STUDENT OFFICE HOURS FOR FALL TERM 2017:

10/26/17 THURSDAY 10:00-11:00 A.M.  
 11/1/17 WEDNESDAY 11:00 A.M.-12:00 P.M.  
 11/7/17 TUESDAY 9:00-10:00 A.M.  
 11/16/17 THURSDAY 11:00 A.M.-12:00 P.M.  
 11/21/17 TUESDAY 10:00-11:00 A.M.  
 11/27/17 MONDAY 10:00-11:00 A.M.

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# CROSSWORD

THE CALIFORNIA TECH

OCTOBER 23, 2017

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## The California Tech

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# ASCIT Minutes

Meetings are every week in SAC 13

**ASCIT Board of Directors Meeting**

Minutes for 20 October 2017. Taken by Dana He.

**Officers Present:** Sakthi Vetrivel, Kavya Sreedhar, Sara Adams, Alice Zhai, Dana He

**Guests:**

**Call to Order:** 10:02 am

**President's Report (Sakthi):**

- IHC got all reports from COUCH, should be working on consolidating information.
- ASCIT meeting with Joe Shepard on Monday.
- Wants to put out survey for Caltech Secure versus BeaverNet.

**Officer's Reports:****V.P. of Academic Affairs (Kavya):**

- Would like to make TQFR improvements such as histograms of actual grades instead of expected grades, etc.
- Appointed three new freshman ARC representatives: Ryan Han, Michael Yao, and Alice Gin.

**V.P. of Non-Academic Affairs (Rachael):**

- IHC will meet this weekend to do complete analysis of the rotation process and decide how to restructure the Bechtel focus group discussion.

**Director of Operations (Sara):**

- Sent out club funding forms last night. Has gotten a couple replies already and will talk to Tom about scheduling.
- Has yearbook proofs and has reviewed about half of them.

**Treasurer (Sarah):**

- We now have a point person so non-Bursar account requests can be processed.
- Have not gotten a reply back from Megin approving the budget yet, but should be fine.
- IRS form was apparently sent to a mailbox in Dabney; will look in to it.

**Social Director (Alice):**

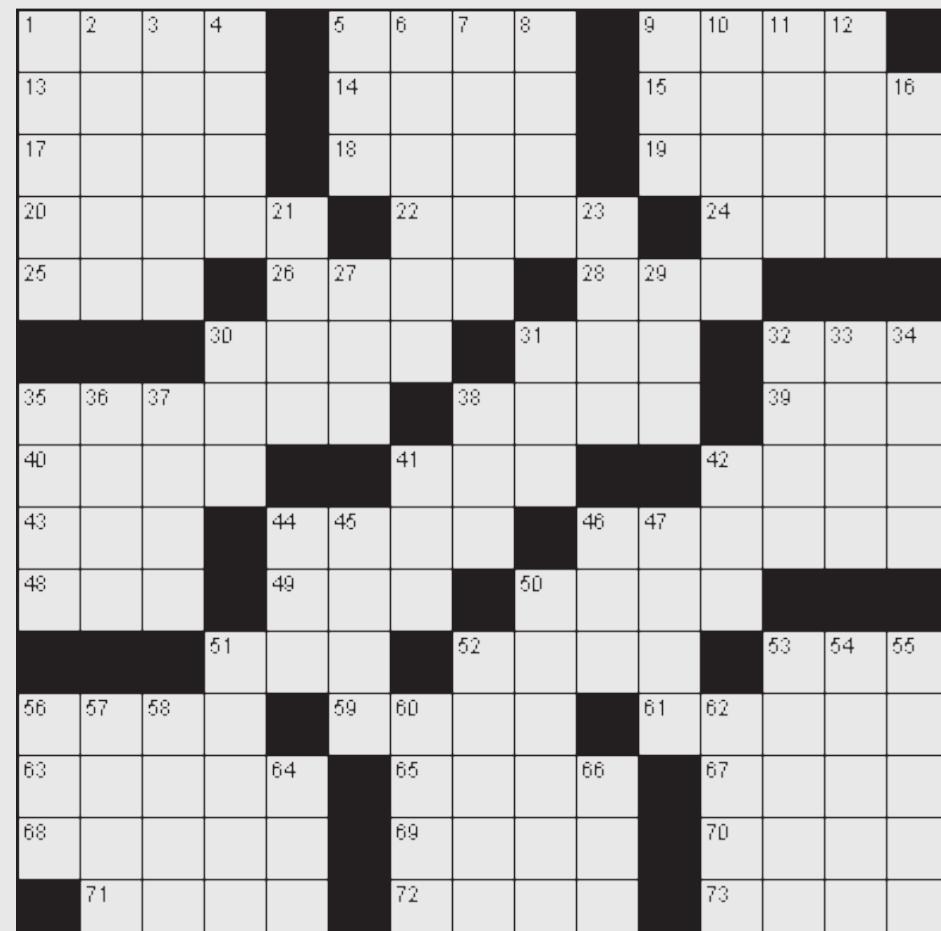
- Trivia Night was yesterday. About 20-30 people were there for the first 30 minutes, will probably cut down on Trivia Night to 1-2 times per term instead of every other week.
- ASCIT Movie Night for Thor next Friday.
- Caltech is having a Nobel Prize celebration from 3-5 pm on Halloween, so Chandler dinner and haunted house/hay ride will be moved to Monday. Plans to allocate \$500 for haunted house/hay ride.
- ASCIT formal survey showed people want similar style as last year. Looking into possible venues.

# Crossword

**Across**

1. Master of ceremonies  
5. Burden  
9. Part of a hospital  
13. Reverberation  
14. Travel charge  
15. Accolade  
17. Close  
18. Hollow cylindrical shape  
19. Relative magnitude  
20. Bare  
22. Mentally healthy  
24. Retained  
25. Whatever  
26. Overt  
28. Beer  
30. Continent  
31. Anger  
32. Central part of a wheel  
35. Arch of the foot  
38. Percussion instrument  
39. Self  
40. Customary observance or practice  
41. Male offspring  
42. Brief social visit  
43. Single  
44. Group of three singers  
46. Unintelligent  
48. Novel  
49. Soaked with liquid  
50. Violent public disorder

51. Enemy  
52. Securely fixed in place  
53. Uncooked  
56. High in stature  
59. Consignment  
61. Wear away  
63. Assumed name  
65. Quarry  
67. Chills and fever  
68. Deep ravine  
69. Unit of area  
70. Brood  
71. Direction  
72. Comparative of little  
73. Animal companions
- Down**
1. Reddish brown dye  
2. Vast body of water  
3. Ricketsy  
4. Ripped  
5. Frequently  
6. Queasiness  
7. Relating to a city  
8. Observed  
9. Armed conflict  
10. Alert  
11. Charge per unit  
12. Trickle  
16. Point  
21. Measured portion of medicine  
23. Acquire by effort or action  
27. Fruit seed  
29. Part of a journey
30. Consumed  
31. Electrically charged particle  
32. Pile  
33. Large sweet juicy fruit  
34. Typeface  
35. Golf club  
36. Square root of eighty-one  
37. Cook slowly in liquid  
38. Sludge  
41. Be seated  
42. Share of the profits  
44. Couple  
45. Spool  
46. Male title  
47. Large and scholarly book  
50. Jockeys  
51. Emblems  
52. Travesty  
53. Rascal  
54. Any mature animal  
55. Hebdomads  
56. Label  
57. Succulent plants  
58. Former currency of Italy  
60. Translucent mineral  
62. Coarse file  
64. Ancient Egyptian god  
66. Affirmative



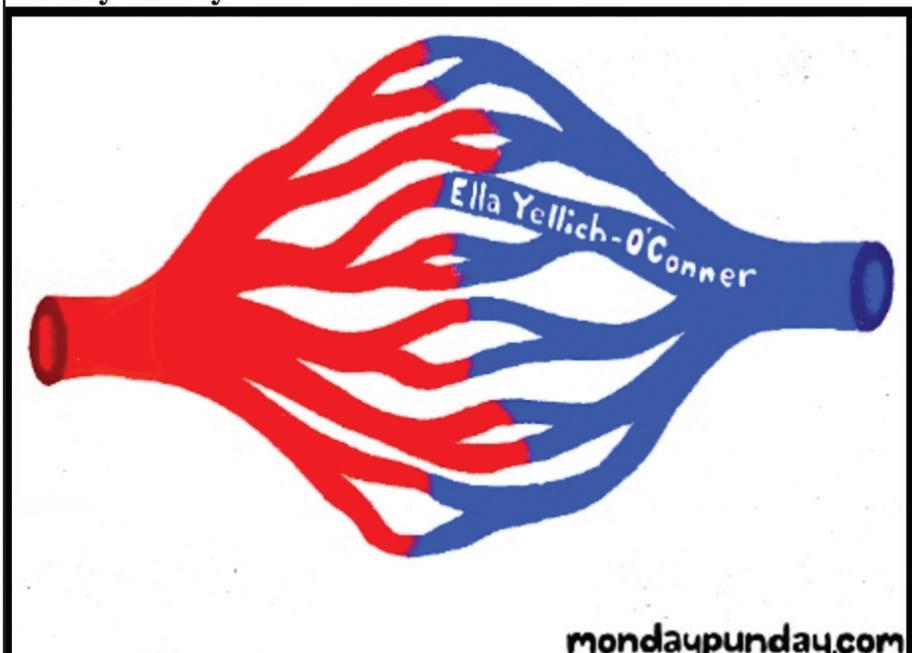
### MARIO ADVENTURE

BY DAVID GINOLA



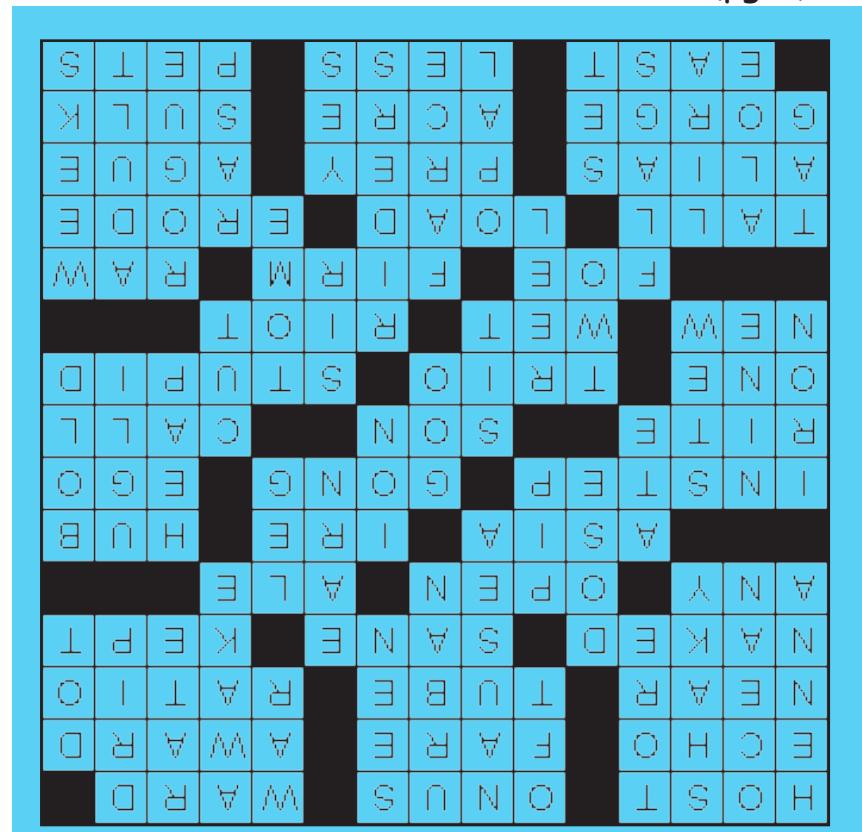
## Answers to current crossword (pg 7)

Monday Punday



This picture represents a common phrase, title, or person.

Think you know the answer? Take a guess at [mondaypunday.com/201](http://mondaypunday.com/201)



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