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The Muslim East in Mozart's Opera 'Abduction From the Seraglio'

CHLOE HSU
Page Editor

In a strange coincidence with current politics, LA Opera's production of Mozart's The Abduction From The Seraglio was premiered on January 28. On the same day of the premiere, Donald Trump closed America's borders to refugees and immigrants from seven Muslim-majority countries. In the opera, the hero Belmonte travels from Paris to Istanbul to rescue his fiancee from the Ottoman ruler Pasha Selim. When the Christian West meets the Muslim East through the Orient Express, the two cultures collide in a series of comedic episodes. The setting of the opera on a moving train symbolizes the changing interactions between the East and the West.

The Turkish monarch Pasha Selim and his servant Osmin are perhaps the most interesting pair of characters. Somewhat surprisingly, Pasha Selim, the central 'villain' of the story, is a spoken role without any singing parts. With Mozart's genius design, Pasha's character is developed by the others' musical response to him, rather than by his own voice. Meanwhile, Bass Morris Robinson's sonorous and resonant voice suits Osmin's vulgar personality very well. Morris Robinson is one the most sought after basses performing today, with acclaimed appearance in The Magic Flute, Don Giovanni, Madama Butterfly, Salome, and others. His voice is a highlight of LA Opera's production of The Abduction From The Seraglio.

Although the opera as a whole is under the influence of 18th-century Orientalism, Pasha and Osmin are far more complex than conventional stereotypes. Despite being in a powerful position, Pasha is determined to win the love of his abducted woman Konstanze (Belmonte's fiancee) without force by being a gentleman. It is very natural for the audience to sympathize with the soft-hearted Pasha, who perhaps represents Mozart's humanist vision of the Muslim West. Meanwhile, his servant Osmin is a barbaric terrorist who tortures Belmonte and teases Konstanze's maid, but a funny terrorist, not a scary one. Mozart presents the conflicts between the East and the West lightheartedly with comedy, sending a message that humor transcends the difference between the two cultures. At the end of the opera, Pasha forgives Belmonte with his genuine benevolence and lets go of the family feud. There is a lesson of Islamic compassion in the happy ending, which might be too good to be true for our current affairs today.

Electrons Use DNA Like a Wire for Signaling DNA Replication

WHITNEY CLAVIN
Caltech Media Relations

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

In the early 1990s, Jacqueline Barton, the John G. Kirkwood and Arthur A. Noyes Professor of Chemistry at Caltech, discovered an unexpected property of DNA—that it can act like an electrical wire to transfer electrons quickly across long distances. Later, she and her colleagues showed that cells take advantage of this trait to help locate and repair potentially harmful mutations to DNA.

Now, Barton's lab has shown that this wire-like property of DNA is also involved in a different critical cellular function: replicating DNA. When cells divide and replicate themselves in our bodies—for example in the brain, heart, bone marrow, and fingernails—the double-stranded helix of DNA is copied. DNA also copies itself in reproductive cells that are passed on to progeny.

The new Caltech-led study, based on work by graduate student Elizabeth O'Brien in collaboration with Walter Chazin's group at Vanderbilt University, shows that a key protein required for replicating DNA depends on electrons traveling through DNA.

"Nature is the best chemist and knows exactly how to take advantage of DNA electron-transport chemistry," says Barton, who is also the Norman Davidson Leadership Chair of Caltech's Division of Chemistry and Chemical Engineering.

"The electron transfer process in DNA occurs very quickly," says O'Brien, lead author of the study, appearing in the February 24 issue of Science. "It makes sense that the cell would utilize this quick-acting pathway to regulate DNA replication, which necessarily is a very rapid process."

The researchers found their first clue that DNA replication might involve the transport of electrons through the double helix by taking a closer look at the proteins involved. Two of the main players in DNA replication, critical at the start of the process, are the proteins DNA primase and DNA polymerase alpha. DNA primase typically binds to single-stranded, uncoiled DNA to begin the replication process. It creates a "primer" made of RNA to help DNA polymerase alpha start its job of copying the single strand of DNA to create a new segment of double-helical DNA.

DNA primase and DNA polymerase alpha molecules both contain iron-sulfur clusters. Barton and her colleagues previously discovered that these metal clusters are crucial for DNA electron transport in DNA repair. In DNA repair, specific proteins send electrons down the double helix to other DNA-bound repair proteins as a way to "test the line," so to speak, and make sure there are no mutations in the DNA. If there are mutations, the line is essentially broken, alerting the cell that mutations are in need of repair. The iron-sulfur clusters in the DNA repair proteins are responsible for donating and accepting traveling electrons.

Barton and her group wanted to know if the iron-sulfur clusters were doing something similar in the DNA-replication proteins.

"We knew the iron-sulfur clusters must be doing something in the DNA-replication proteins, otherwise why would they be there? Iron can damage the DNA, so nature would not have wanted the iron there were it not for a good reason," says Barton.

Through a series of tests in which mutations were introduced into the DNA primase protein, the researchers showed that this protein needs to be in an oxidized state—which means it has lost electrons—to bind tightly to DNA and participate in DNA electron transport. When the protein is reduced—meaning it has gained electrons—it does not bind tightly to DNA.

"The electronic state of the iron-sulfur cluster in DNA primase acts like an on/off switch to initiate DNA replication," says O'Brien.

What's more, the researchers demonstrated that electron transport through DNA plays a role in signaling DNA primase to leave the DNA strand. (Though DNA primase must bind to single-stranded DNA to kick off replication, the process cannot begin in earnest until the protein pops back off the strand).

The scientists propose that the DNA polymerase alpha protein, which sits on the double helix strand, sends electrons down the strand to DNA primase. DNA primase accepts the electrons, becomes reduced, and lets go of the DNA. This donation and acceptance of electrons is done with the help of the iron-sulfur clusters.

"You have to get the DNA primase off the DNA quickly—that really starts the whole replication process," says Barton. "It's a hand off of electrons from one cluster to the other through the DNA double helix."

Many proteins involved in DNA reactions also contain iron-sulfur clusters and may also play roles in DNA electron transport chemistry, Barton says. What began as a fundamental question 25 years ago about whether DNA could support migration of electrons continues to lead to new questions about the chemical workings of cells. "That's the wonder of basic research," she says. "You start with one question and the answer leads you to new questions and new areas."

The study, titled, "The [4Fe4S] Cluster of Human DNA Primase functions as a Redox Switch using DNA Charge Transport," was funded by the National Institutes of Health. The collaborative work also included Vanderbilt coauthors Marilyn Holt, Matthew Thompson, Lauren Salay, and Aaron Ehlinger.

NASA Telescope Reveals Batch of Earth-Size, Habitable-Zone Planets

WHITNEY CLAVIN
Caltech Media Relations

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

NASA's Spitzer Space Telescope has revealed the first known system of seven Earth-size planets around a single star. Three of these planets are firmly located in the habitable zone, the area around the parent star where a rocky planet is most likely to have liquid water.

The discovery sets a new record for greatest number of habitable-zone planets found around a single star outside our solar system. All of these seven planets could have liquid water -- key to life as we know it -- under the right atmospheric conditions, but the chances are highest with the three in the habitable zone.

"This discovery could be a significant piece in the puzzle of finding habitable environments, places that are conducive to life," said Thomas Zurbuchen, associate administrator of the agency's Science Mission Directorate in Washington. "Answering the question 'are we alone' is a top science priority and finding so many planets like these for the first time in the habitable zone is a remarkable step forward toward that goal."

At about 40 light-years (235 trillion miles) from Earth, the system of planets is relatively close to us, in the constellation Aquarius. Because they are located outside of our solar system, these planets are scientifically known as exoplanets.

This exoplanet system is called TRAPPIST-1, named for The Transiting Planets and Planetesimals Small Telescope (TRAPPIST) in Chile. In May 2016, researchers using TRAPPIST announced they had discovered three planets in the system. Assisted by several ground-based telescopes, including the European Southern Observatory's Very Large Telescope, Spitzer confirmed the existence of two of these planets and discovered five additional ones, increasing the number of known planets in the system to seven.

The new results were published Wednesday in the journal Nature, and announced at a news briefing at NASA Headquarters in Washington.

Using Spitzer data, the team precisely measured the sizes of the seven planets and developed first estimates of the masses of six of them, allowing their density to be estimated.

Based on their densities, all of the TRAPPIST-1 planets are likely to be rocky. Further observations will not only help determine whether they are rich in water, but also possibly reveal whether any could have liquid water on their surfaces. The mass of the seventh and farthest exoplanet has not yet been estimated -- scientists believe it could be an icy, "snowball-like" world, but further observations are needed.

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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 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

1. Caltech Y Nuclear Winter Series

International Nuclear Weapons Policy in the Current Era:

A Conversation with Dr. Michael Nacht

Wednesday | February 8th | 12:00 to 1:30 pm | Location to be announced | Lunch is provided (spaces are limited), RSVP Required

RSVP: https://goo.gl/forms/UvTmxsIvKAMazxCo1

Michael Nacht served as Assistant Secretary of Defense for Global Strategic Affairs (2009-2010), for which he received the Distinguished Public Service Award, the Department's highest civilian honor. He also served as Assistant Director for Strategic and Eurasian Affairs of the US Arms Control and Disarmament Agency (94-97), during which time he participated in five Presidential summits – four with Russian President Yeltsin and one with Chinese President Jiang Zemin. Nacht currently holds the Thomas and Alison Schneider Chair in Public Policy at U.C. Berkeley and is Chair of the Policy Focus Area for the Nuclear Science and Security Consortium led by the Berkeley Department of Nuclear Engineering. He is the author or co-author of six books and more than eighty articles and book chapters on nuclear weapons policy; regional security issues affecting Russia and China, the Middle East and East Asia; cyber and space policy; counter-terrorism and homeland security; international education; and public management.

The Caltech Y Social Activism Speaker Series (SASS) Committee is hosting the lunch seminar with Professor Michael Nacht to discuss recent international developments in nuclear weapons policy as a part of a Nuclear Winter Series. As tempers flare and tensions rise across the globe, open dialog on nuclear arms is more important now than ever. Watch for more programs within the series this winter term. Programs coordinated by the Social Activism Speaker Series were made possible with generous support from the George Housner fund and the Caltech Y.

2. Hathaway Sycamores

Every Wednesday | 5:30 - 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 an hour of travel time and 1.5 hours of tutoring. Transportation is included.

For more info and to RSVP email Sherwood Richers at srichers@tapir.caltech.edu. Eligible for Federal Work Study.

3. Pasadena LEARNS

Every Friday | 3:00 - 5:00 PM | 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 azhai@caltech.edu. Eligible for Federal Work Study.

Beyond the Y

1. Rev. William Barber, President of the North Carolina NAACP

Wednesday | February 1 | 7:00 pm | Thorne Hall – Occidental College in Eagle Rock | Free

Oxy Facebook event page: https://www.facebook.com/events/648332075331014

Rev. Barber is the president of the North Carolina NAACP and leader of the Moral Monday movement, a multi-racial, multi-generational interfaith movement that has led protests at the NC General Assembly around issues of injustice, including voting rights, gun violence, immigration reform, school funding, LGBT rights, the minimum wage and workers' rights, and others. Hundreds of activists, including Dr. Barber himself, have also engaged in non-violent civil disobedience to expose what the politicians in North Carolina are trying to do in the dark.

The event is sponsored by Occidental College and several student groups and cosponsored by the Southern Christian Leadership Conference, Clergy and Laity United for Economic Justice, the Coalition for Humane Immigrant Rights in LA, the LA Alliance for a New Economy, the LA County Federation of Labor, the Black Worker Center, and LA Voice. Martin Luther King spoke in Thorne Hall in April 1967, 50 years before Rev. Barber's talk.

Rev. Barber's speech to the Democratic convention last summer made headlines around the world. If you weren't able to see it then, here's a link to that speech: https://www.youtube.com/watch?v=aw3PUghqlAA

2. Science Fair Judges Needed

February 6th - 9th | 9:00 AM - 2:30 PM (Flexible Hours) | Glendale, Ca

Volunteer judges are needed for Franklin Magnet School Science Fair in Glendale. Transportation available and we will feed you too! Graduate students preferred but all welcome to apply.

The times are flexible and you don't have to be present for the whole time slot. We are in need of 12 volunteers to judge our students' projects/submissions. Ideally these volunteers will have a solid background in science and/or currently work in a science-related field. Another preference is that the volunteers not be related to any children at our school to ensure impartiality when awarding prizes.

Please let me know as soon as possible if you or any of your colleagues would be willing to commit to this awesome event that fosters a love of science in our youth. Please email Mary at mbehar@gmail.com immediately if interested! Time is running short. Compensation will be in the form of a free lunch on the day(s) of service, networking with other scientists and the joy of having volunteered.

We are also open to any donated prizes you think elementary school-age children might want for first, second, third prize and honorary mentions.

VICE PROVOST'S OFFICE HOURS

Vice Provost, Chief Diversity Officer, and Professor of English, Cindy Weinstein, offers weekly office hours. This is an opportunity for undergraduate, graduate students, and postdocs to meet and discuss topics 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 Libraries. There are four 15-minute appointments available per hour. Please sign up in Parsons-Gates room 104, or call the Vice Provost's Office at ext. 6339.

Student Office Hours for Winter Term 2017:

3/2/17 Thursday 12:00-1:00 p.m.

3/8/17 Wednesday 11:00-12:00 p.m.

3/13/17 Monday 10:00-11:00 a.m.

Largest Batch of Habitable-Zone Planets Found Around Single Star

Continued from page 1

"The seven wonders of TRAPPIST-1 are the first Earth-size planets that have been found orbiting this kind of star," said Michael Gillon, lead author of the paper and the principal investigator of the TRAPPIST exoplanet survey at the University of Liege, Belgium. "It is also the best target yet for studying the atmospheres of potentially habitable, Earth-size worlds."

In contrast to our sun, the TRAPPIST-1 star -- classified as an ultra-cool dwarf -- is so cool that liquid water could survive on planets orbiting very close to it, closer than is possible on planets in our solar system. All seven of the TRAPPIST-1 planetary orbits are closer to their host star than Mercury is to our sun. The planets also are very close to each other. If a person were standing on one of the planet's surface, they could gaze up and potentially see geological features or clouds of neighboring worlds, which would sometimes appear larger than the moon in Earth's sky.

The planets may also be tidally locked to their star, which means the same side of the planet is always facing the star, therefore each side is either perpetual day or night. This could mean they have weather patterns totally unlike those on Earth, such as strong winds blowing from the day side to the night side, and extreme temperature changes.

Spitzer, an infrared telescope that trails Earth as it orbits the sun, was well-suited for studying TRAPPIST-1 because the star glows brightest in infrared light, whose wavelengths are longer than the eye can see. In the fall of 2016, Spitzer observed TRAPPIST-1 nearly continuously for 500 hours. Spitzer is uniquely positioned in its orbit to observe enough crossing -- transits -- of the planets in front of the host star to reveal the complex architecture of the system. Engineers optimized Spitzer's ability to observe transiting planets during Spitzer's "warm mission," which began after the spacecraft's coolant ran out as planned after the first five years of operations.

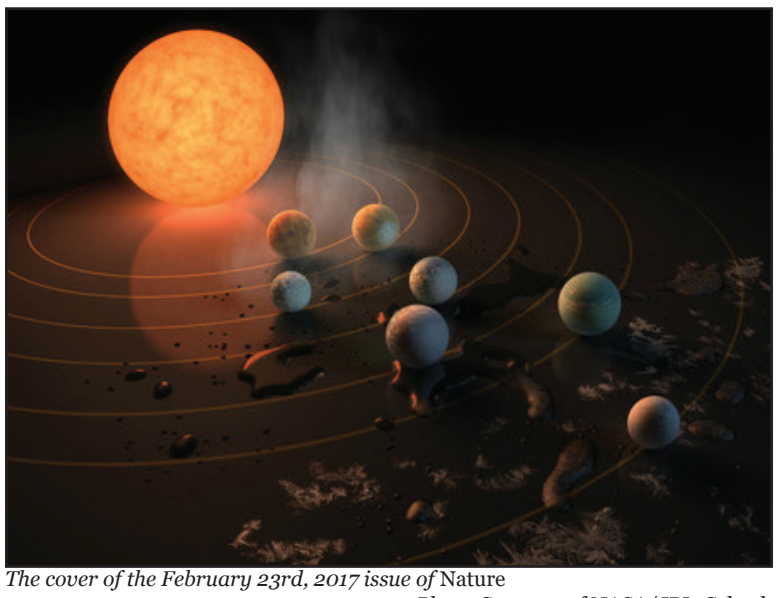
"This is the most exciting result I have seen in the 14 years of Spitzer operations," said Sean Carey, manager of NASA's Spitzer Science Center at Caltech/IPAC in Pasadena, California. "Spitzer will follow up in the fall to further refine our understanding of these planets so that the James Webb Space Telescope can follow up. More observations of the system are sure to reveal more secrets."

Following up on the Spitzer discovery, NASA's Hubble Space Telescope has initiated the screening of four of the planets, including the three inside the habitable zone. These observations aim at assessing the presence of puffy, hydrogen-dominated atmospheres, typical for gaseous worlds like Neptune, around these planets.

In May 2016, the Hubble team observed the two innermost planets, and found no evidence for such puffy atmospheres. This strengthened the case that the planets closest to the star are rocky in nature.

"The TRAPPIST-1 system provides one of the best opportunities in the next decade to study the atmospheres around Earth-size planets," said Nikole Lewis, co-leader of the Hubble study and astronomer at the Space Telescope Science Institute in Baltimore. NASA's planet-hunting Kepler space telescope also is studying the TRAPPIST-1 system, making measurements of the star's minuscule changes in brightness due to transiting planets. Operating as the K2 mission, the spacecraft's observations will allow astronomers to refine the properties of the known planets, as well as search for additional planets in the system. The K2 observations conclude in early March and will be made available on the public archive.

Spitzer, Hubble, and Kepler will help astronomers plan for follow-up studies using NASA's upcoming James Webb Space Telescope, launching in 2018. With much greater sensitivity, Webb will be able to detect the chemical fingerprints of water, methane, oxygen, ozone, and other components of a planet's atmosphere. Webb also will analyze planets' temperatures and surface pressures -- key factors in assessing their habitability.



The cover of the February 23rd, 2017 issue of Nature
Photo Courtesy of NASA/JPL-Caltech

Faith in God and Faith in Science

Veritas Forum: Meaning-Making Methodologies

NOELLE DAVIS
Page Editor

On Wednesday, February 15th, students, faculty, and community members packed Baxter to hear two esteemed professors discuss the meaning of life—and sporadically gush about the greatness of tenure—from starkly different worldviews: Christianity and atheism. The event was planned by the Veritas Forum, an organization which aims to help those on college campuses "ask life's hardest questions" by juxtaposing different worldviews. Veritas originated at Harvard in 1992 and puts on annual events at Caltech and other colleges across the world, with past speakers including Francis Collins, leader of the Human Genome Project and a Christian, and Steven Pinker, an atheist philosophy professor at Harvard.

The speakers at Wednesday's forum were Caltech's beloved Paul Asimow of the geology department, an atheist, and Francis Su, a math professor at Harvey Mudd, a Christian and the president of the Mathematical Association of America. Dr. Asimow comes from a "purebred" Jewish family and while growing up, attended Hebrew school. However, he never really subscribed to the religion because he was taught to "go through the motions" without understanding. He has aimed to construct from logic alone his view of the world and of right and wrong—no god needed. His conclusion? Jesus's teaching of the Golden Rule, to "do to others what you would have them do to you," is the foundation of morality, but it can be found independently of Judeo-Christianity. For him, life derives meaning from his family, work, and contributions to the world.

Dr. Su, on the other hand, grew up in a non-religious household. In his freshman year of college, however, his values were shaken when his dad was diagnosed with cancer and his mom with ALS. "Why am I trying so hard to be successful if we just live and die and that's it?" he questioned. With this new perspective, his quest to do good seemed futile. These ideas and an increasing realization of his own selfishness he found to align with Christianity. After hearing from Christians that following Jesus actually wasn't about trying to be more moral like he'd thought, he became a Christian. Since Jesus loved people the world didn't love, an idea Dr. Su calls "deeply Christian," Dr. Su now believes that one's dignity comes not from accomplishments, beauty, or even morality, but rather, from God. In his desire to "make the world a better place," he now puts the emphasis not on himself doing good, but on others being served.

After Dr. Su and Dr. Asimow introduced themselves, they began a question-and-answer discussion moderated by Dr. Katie Galloway of USC. A selection of responses, edited for brevity and clarity, follow.

When you reach the end of your life, how will you evaluate whether you spent it wisely?

Su: It's not about being a wonderful math professor—although I am—but about loving and serving those around me. It's not about what I've done, so for example, I'm not concerned about getting papers published in the most prestigious journal. Will I still try? Yes. But it's not everything. Having faith is like having tenure.

Asimow: Similarly, the question is, 'Did I love and serve the people around me?' This is more important than how many papers I've published. It's the same conclusion as Francis, but different inspiration.

Why do you believe in the special dignity of humans—why are they more important than other creatures, and sometimes even more important than oneself?

Asimow: I am vegetarian, but humans have a special dignity to other humans because we can understand each other, and to some extent because we understand the concept of dignity.

Su: In the Christian faith, we see that dignity through the person of Jesus, who treated everyone with dignity.

Does it ever surprise you or fill you with wonder that math works?

Asimow: I'm not surprised, because I see it every day, but it does fill me with wonder.

Su: As a scientist, my feeling of awe and wonder is the closest feeling to worship. Also, I'd like to encourage people not to be turned away from religion because it's strange—science is strange too, like light being both a wave and a particle.

Asimow: Some people find it in their nature to have faith in science, and others, to have faith in God. Either way, it is faith. Nobody can test everything they believe.

Su: Testing everything in science—that'd make a great grant proposal.

What worries you the most about other worldviews?

Su: The idea of no absolute truth is very dangerous. I'd say this has given rise to fake news.

Asimow: I'd actually say dogma, like young earth creationism.

Do you feel the need to persuade others of your own worldview?

Asimow: No, but I'm willing to answer if you have questions. However, I don't see any use in talking to fundamentalists, because they don't actually listen.

Su: I do feel it's important for me to share my faith, but not in a coercive way. Being coercive is not treating others with dignity.

Any closing comments or advice for the audience?

Su: Don't just doubt the faith, but doubt your doubts.

Asimow: If you're going to find meaning, it's going to come from within. Our meaning is defined by what we do—since everyone has free will—and it comes from being the best you that you can be.

Missed the event and want to hear all of what Dr. Asimow and Dr. Su had to say? See veritas.org for a soon-to-be-available video. In addition, the Caltech Christian Fellowship would like to invite anyone interested in continuing the discussion to attend their Monday meetings at 8pm in the 3rd floor conference room of SFL.

Paul Asimow and Francis Su at the Veritas Forum
Photo Courtesy of Noelle Davis

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 small room just off the lounge in Winnett. All students are welcome, from total beginners to more experienced meditators.

Mailing list and MP3 archive:
counseling.caltech.edu/students/meditation

Lewis scores 17 in swan song

GOCALTECH.COM
Actual Sports Content Editor

THOUSAND OAKS, Calif. (Feb. 21, 2017) – Senior Kate Lewis scored 17 points and pulled down eight rebounds while playing in the entirety of her final game with Caltech. The Beavers suffered 85-57 SCIAC loss at California Lutheran University on Tuesday evening.

Sophomore Elizabeth Eiden overcame the Beavers' slow start to open the scoring for Caltech on a transition play. Eiden accounted for six of the Beavers eight points in the first quarter. Freshman Samantha D'Costa scored the other bucket for Caltech in the opening quarter. Caltech's scoring output almost doubled in the second period as the Beavers were able to keep the game from getting too far out of hand. The Regals' defensive press caused problems for the Beavers a majority of the first half, but once Caltech broke the press they settled into their offense and were able to get to the rim on multiple occasions working within the parameters of its half-court offense.

Eiden and D'Costa started off the scoring again for the Beavers to start the second half. Eiden was doing it all on the inside as she scored off multiple post moves and grabbed boards on both ends. Lewis found Eiden in the post multiple times as she was double teamed almost every time she caught the ball. D'Costa turned it on in the second half and beat her defender for several easy buckets. Lewis would score the final two points of the season on a layup with two seconds remaining on the clock. D'Costa finished the evening with 15 points and seven rebounds and Eiden scored 14 points and pulled down a team high nine boards. The Beavers scored 42 of their points in the paint on the nigh and finished the evening shooting 41.4 percent from the field, 69.2 percent from the free throw line.

Head Coach Sandra Marbut and the Beavers finished the season with an overall record of 4-20 and 2-14 in the SCIAC. Lewis, meanwhile closed out her illustrious Caltech career with 1245 points, 768 rebounds, 94 blocks, 181 assists, and 322 player fouls. She ends her career as the second-leading scorer and rebounder in program history.

Kate's head was somehow mistaken for the basketball. Get the girl some glasses.

-gocaltech.com

Burleson collects three hits in loss to Bates

GOCALTECH.COM
Actual Sports Content Editor

PASADENA, Calif. (Feb. 22, 2017) – Sophomore Mark Burleson went three-for-five at the dish and knocked in two runs as Caltech fell to visiting Bates College on Wednesday afternoon. The Beavers provided consistent offense throughout but were unable to overcome two blow-up innings on the mound in a mid-week bullpen game.

Senior Tim Menninger got the start for Caltech and pitched two scoreless innings to run his earned-run average on the year to 1.04. Freshman Alex Corado relieved Menninger in the second inning but could only muster one out. He gave up four runs, all earned on two hits before giving way to senior John Galden. Galden used his off-speed stuff to break up the Bobcats' offensive surge and lasted through the fourth innings. He struck out one batter without surrendering any hits or runs. Senior Kai Kirk's turn to pitch came in the top of the fifth inning, with Burleson and the Beavers' offense having erased the damage done during Corado's turn. Kirk, who normally functions as Caltech's second starting pitcher, did not have his usual stuff. He survived the fifth inning with just one earned run, but really came unglued in the sixth inning when he loaded the bases with a one-out walk. Afterwards, Kirk surrendered a two-run single and a bases clearing triple before giving up a two-run home run to third baseman Dan Trulli. Freshman Grant Messner and Senior Garrett Levine pitched out the rest of the game, but the deficit deficit proved too steep for the offense to overcome. Kirk would ultimately be saddled with the loss.

Big Bobcats innings aside, the Beavers kept themselves in the game early with steady offensive production. Senior Harrison Jacobs led off for Caltech for the first time this year and responded by going 1-for-2 at the plate. Senior Schaeffer Reed had a nice day for himself by scoring two runs and bagging a steal. Burleson knocked in Reed for one of his RBIs and knocked in sophomore Connor Moffatt in the sixth inning on a separate single. Moffatt, meanwhile ran his current hitting streak to 12 games dating back to last season.

Marky mark and the funky bunt.

Photo Courtesy of Elise Cutts

Gallup claims double SCIAC titles, men place sixth

GOCALTECH.COM
Actual Sports Content Editor

COMMERCE, Calif. (Feb. 18, 2017) – Rookie Thomas Gallup claimed the 100-200 Breast double for Caltech men's swim & dive on the final day of the 2016-17 SCIAC Championships.

The freshman superstar lowered his own program record and NCAA 'B' cut from the morning preliminary session to a 2:02.11, which currently ranks 12th in all of Division III, giving him another solid chance to qualify for the NCAA Championships. Once again, he led from start to finish, taking out the first 50 a half-second faster than anyone else and extending his lead beyond two seconds at the penultimate turn before running out of gas but riding his sizable cushion to the easy win.

The Beavers placed sixth as a team with a total of 341 points for their highest finish in over a decade and a mere six points shy of fifth place. The last time Caltech finished as high as sixth came in 1999, when just seven teams competed in the SCIAC, while the Beavers defeated the most teams (three) since 1985-86 and scored their highest point total since 1988-89.

Junior Avikar Periwal scored the first point of the final day for Caltech, placing 18th in the 1650 Free immediately following the prelims in a personal-best 17:19.35.

Veni. Natavi. Vicci.

Photo Courtesy of Joe Bergman

Sophomore Dylan Lu then got the finals sessions started with an eighth-place finish in the 200 Back, shaving two seconds off his morning time to lower the program record he set as a rookie last year to 1:53.61 and move up from his ninth seed. Also in the morning session, senior Kyle Seipp dropped more than five seconds in the 100 Free to get under the 1:00 barrier at 58.91, while junior Alexander Bourzutschky, fresh off his Jeopardy College Challenge semifinals victory, shaved four seconds in the 200 Breast to clock a 2:34.23.

Classmate Jonathan Willett trimmed his 100 Free time to an impressive 46.27 thanks to splitting the third-fastest back-half of the heat, after which Gallup recorded his historic win and sophomore Adam Dai clocked a PR of 2:13.70 to place 18th in the 200 Breast.

The Beavers were represented by another pair in the final individual event as sophomore Henry Steiner and freshman Alex Moraru had qualified for the finals heat earlier in the day and each lowered their times. Steiner bookeneded an impressive race with the fourth-fastest opening 50 and second-quickest final leg, ultimately dropping a full second from his rookie PR to post a 1:53.80, with Moraru also coming in under Steiner's former record.

The epic closed with the 400 Free Relay and the Beavers looking to catch the University of La Verne in fifth place. The 'B' quartet of Moraru, senior Leon Ding. Periwal and junior Hanzhi Lin kept that hope alive, out-touching the Leopards by just .05 and clocking the fifth-fastest time in program history. Steiner then led off the 'A' relay with a PR 47.69, followed promptly by Lu in 48.34 and Gallup with a 46.95. Willett closed with the fourth-fastest anchor leg of any relay in a 45.63, nearly running La Verne down as he outsplit his opposing Leopard by more than two seconds but still putting the finishing touch on yet another record at 3:08.61.

In the first year of Head Coach Paul Hughes' tenure, the Beavers set a total of 13 program records, including nine individual marks and four of the five relays. Steiner holds three himself, with Gallup, Lu and Willett each claiming two and Moraru earning one. Gallup and his teammates now will eagerly await news of whether the rookie has qualified for the NCAA Championships, which will be revealed in the next week.

Counseling Center Groups and Workshops

Winter Term 2017

The counseling center is excited to announce our workshops for the Winter term:

Workshops

Catalyst: A 3-week workshop teaching general coping skills

Refresh: A 1-hour workshop teaching how to get better sleep

Emotion Lab: A 1-hour workshop to recognize your emotions better

Spark: A 1-hour workshop to cope with procrastination and work avoidance.

Groups

Social Confidence: A 7-week week group for anyone who'd like to be more comfortable and less anxious in social situations. Pre-screening required; see the webpage for more information. Begins 1/23.

Mindfully Resilient: An 8-week group focused on reducing the risk of relapse for depression and anxiety. Pre-screening required; see the webpage for more information. Begins 1/12.

For the full list of workshops, dates, and times, visit:
counseling.caltech.edu
and follow the link to the new classes and workshops.

2017 CALTECH UNDERGRADUATE WRITING PRIZES

Each year the division of Humanities and Social Sciences awards a number of prizes for undergraduate writing. Consider submitting your work to be recognized and rewarded for your work as a writer.

Submit your writing this year for these prizes:

MARY A. EARL MCKINNEY PRIZE IN LITERATURE
Awarded to the best original poetry and fiction. Submit up to three poems. Fiction should not exceed 12,000 words – one submission.
Prize amount: $500.00/each category

GORDON MCCLURE MEMORIAL COMMUNICATIONS PRIZE
Awarded to the best academic writing in three categories: English, History and Philosophy.
Prize amount: $500.00/each category

HALLETT SMITH PRIZE
Awarded to an outstanding essay related to the work of Shakespeare.
Prize amount: $500.00

Copies of last year's prizewinning writing are stored in CaltechTHESIS, and they can be viewed by following links from this writing center webpage: http://writing.caltech.edu/community/prizes

Submission Guidelines:

Deadline: April 4th, 2017

Only currently enrolled full-time students may submit. Entries should be double-spaced PDFs. Winners will be announced in June, and winners' names will be in the commencement program. Winning writing will be archived using CODA through the Caltech Library. Email entries to Sini Elvington at elvington@caltech.edu, noting the prize to which you are applying in the email subject and filename.

Project IDEA.
inspire discover express accept.

Caltech's creative assignment for your week.

Search 'sonder' in the Dictionary of Obscure Sorrows. Read other entries until you find one that you like. Why do you like it?

Send us a picture of a scar on your body and tell us the story behind it.

Tell us about your favorite color and its associations.

When and why did you last cry?

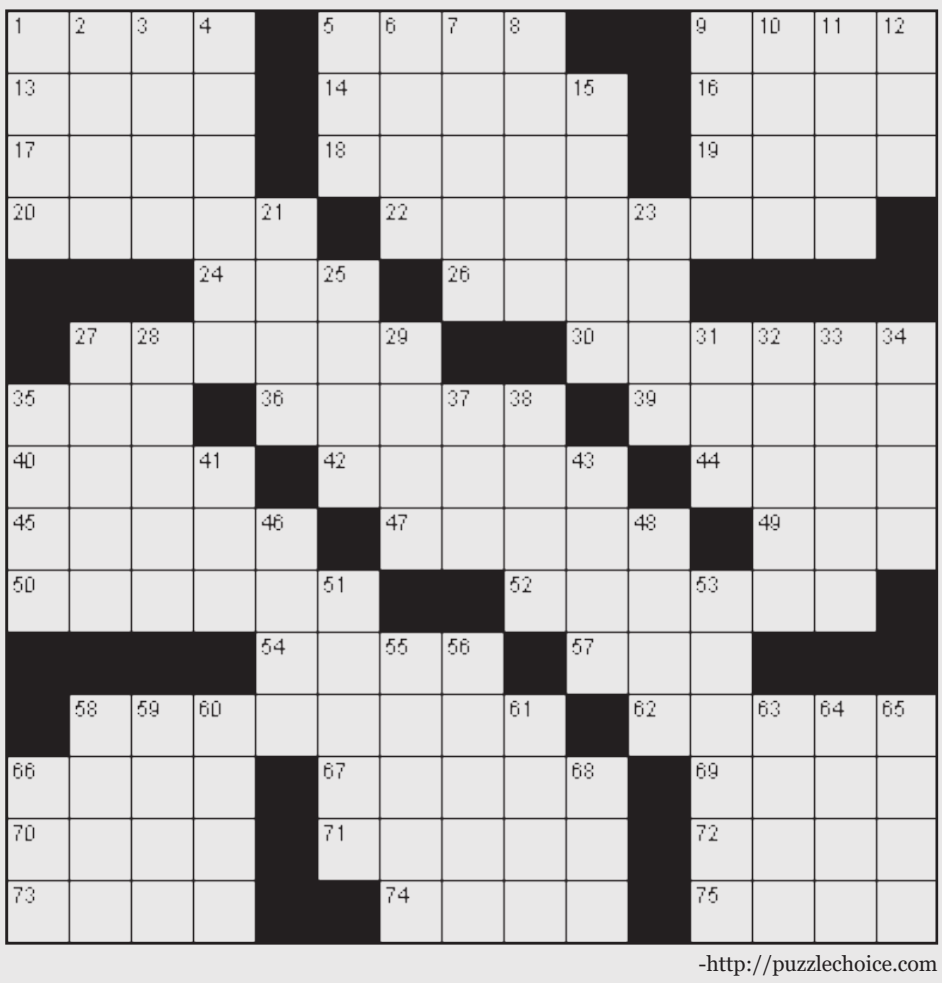
Please send all responses to totem@caltech.edu.

Last week: What would you do if you saw a dancing pancake? What is a crazy idea you have? Tell it to someone. Write down your idea and their reaction. What is something you never want to forget? Write the phone call you wish to have. Format it as a dialogue/script in first-persons. A: Hi, how's it-- Me: Bye. For more, go to https://www.facebook.com/CaltechTotem.

Crossword

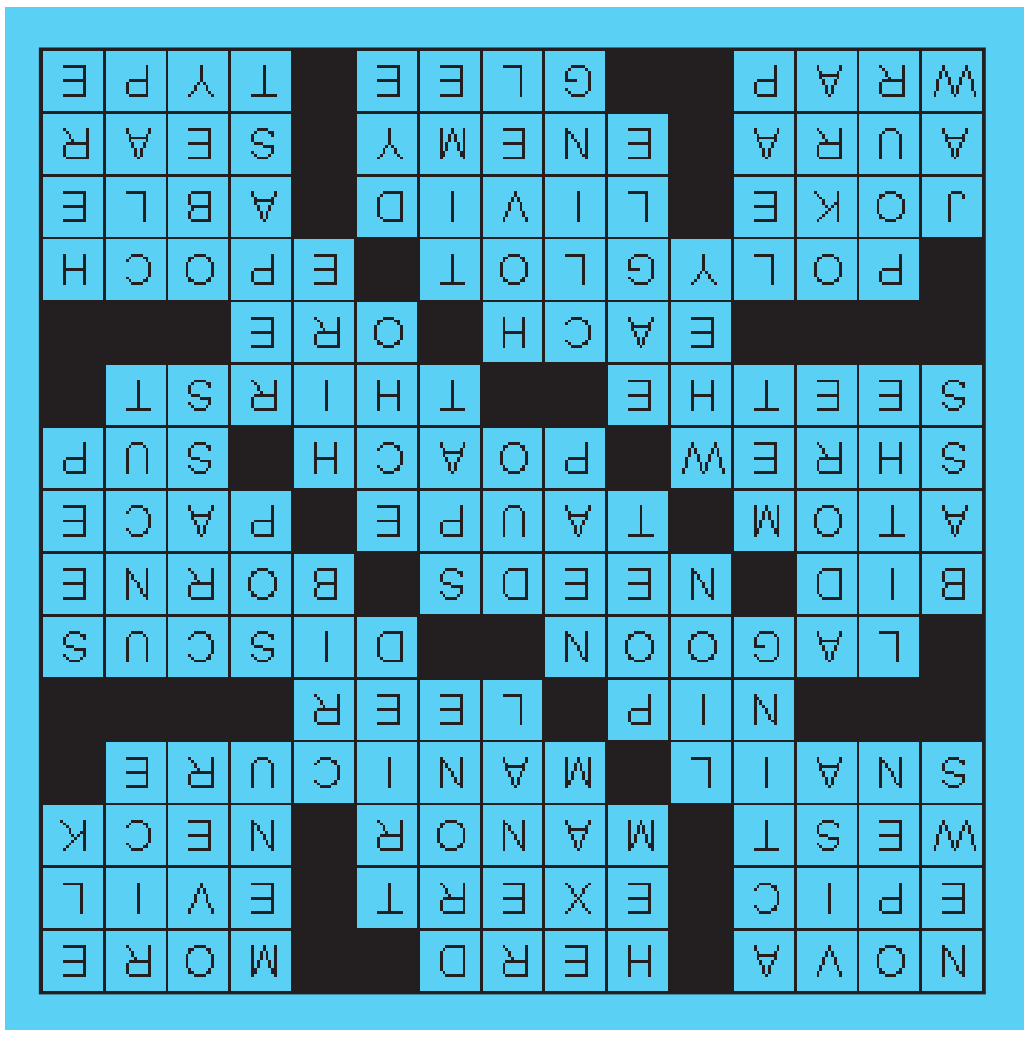
Across
1. Kind of star
5. Group of cattle or sheep
9. To a greater extent
13. Heroic poem
14. Make a great effort
16. Iniquity
17. Direction
18. Mansion
19. Narrow projecting strip of land
20. Gastropod
22. Beauty treatment
24. Pinch
26. Facial expression
27. Body of water
30. Field event
35. Tender
36. Necessities
39. Carried in a certain way
40. Molecule
42. Greyish brown
44. Step
45. Mouselike mammal
47. Hunt illegally
49. Take liquid a little at a time
50. Boil vigorously
52. A need to drink
54. Apiece
57. Metal-bearing mineral
58. Linguist
62. Unit of geological time
66. Gag
67. Ashen
69. Having the means to do something
70. Halo
71. Foe
72. Scorch
73. Enfold
74. Mirth
75. A specific kind

Down
1. Reported information
2. Overt
3. Passport endorsement
4. Pretending
5. Lap
6. Test
7. Relating to the kidneys
8. Stingless male bee
9. Bill of fare
10. Finished
11. Food grain
12. Moose
15. Attempted
21. Predatory feline
23. Cot
25. Bard
27. Supple
28. Worship
29. Form of tide
31. Soak through
32. Unrefined
33. Complete or full-length
34. Ooze
35. Freshwater fish
37. Singing couple
38. Squabble
41. Encountered
43. Reverberation
46. Dairy product
48. Charter
51. Bird of prey
53. Meal
55. Hold on tightly
56. Small crude shelter
58. Rain heavily
59. Gumbo
60. Jump
61. Measure the duration of something
63. Comply
64. Applaud
65. This place
66. Mandible
68. Staining substance



-http://puzzlechoice.com

Answers to current crossword (pg 7)



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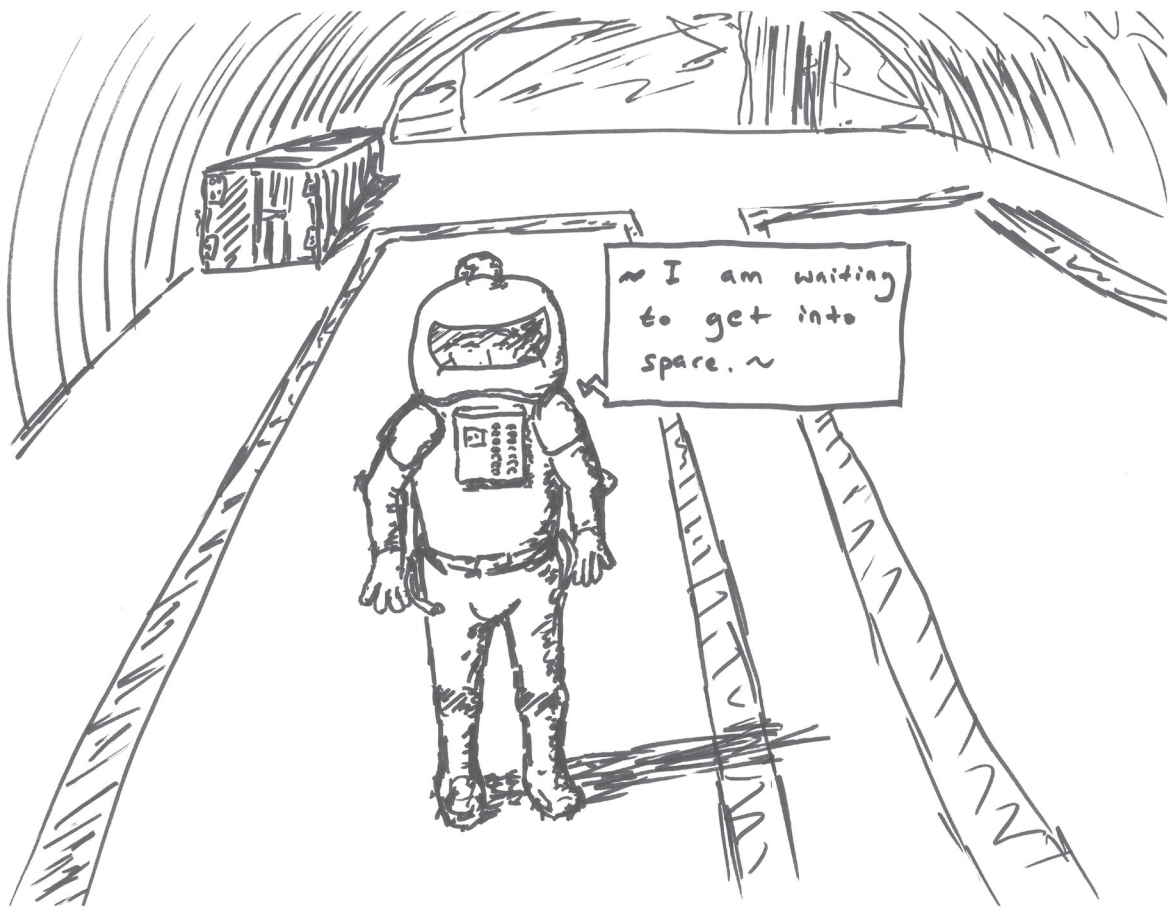

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