

- Meet history professor Danielle Wiggins
- Essential Caltech
- A student steps up

Warped Space, in Paint and Poetry

This spring, Los Angeles-based artist Lia Halloran was to have joined Caltech as artist-in-residence in the Division of the Humanities and Social Sciences as part of the Caltech-Huntington Program in Visual Culture. COVID-19 upended those plans, and Halloran's residency has been postponed until the spring of 2021.

The past few months have been busy for Halloran, however, as she has put the finishing touches on a book project she has been working on for more than a decade with Kip Thorne (BS '62), Caltech's Richard P. Feynman Professor of Theoretical Physics, Emeritus, and one of the recipients of the 2017 Nobel Prize in Physics. The book, *The Warped Side of Our Universe*, is to be published by W. W. Norton & Company in 2021 and features poetic verse by Thorne alongside paintings by Halloran.

As an associate professor of art at Chapman University, Halloran has exhibited her work widely in the United States and Europe. In 2016, her art installation *Deep Sky Companion* opened at Caltech's Cahill Center for Astronomy and Astrophysics. For that exhibit, Halloran used painting and photographic techniques to create 110 prints inspired by the 18th-century French comet hunter Charles Messier.

Caltech magazine recently talked with Halloran and Thorne about their creative partnership.

Lia Halloran: During my first year of graduate school at Yale I started reading Kip's book *Black Holes & Time Warps* (W. W. Norton & Company, 1994). There was something about the way Kip described this odd warping and bending of space that just made me feel transported. Most of the paintings in my MFA thesis exhibit were based on reading what Kip wrote. So, I was collaborating with him before I even met him.

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The Warped Side of our Universe

is home to many beasts —

Beasts that are forged

from warped space and time.

Beasts that may include

black holes and wormholes,

time machines and cosmic strings,

gravity waves and singularities

our universe's big-bang birth

and many other beasts

wondrous, weird and wild.

Extract from the Prologue of

The Warped Side of Our Universe

Warped Space

► continued from page 5

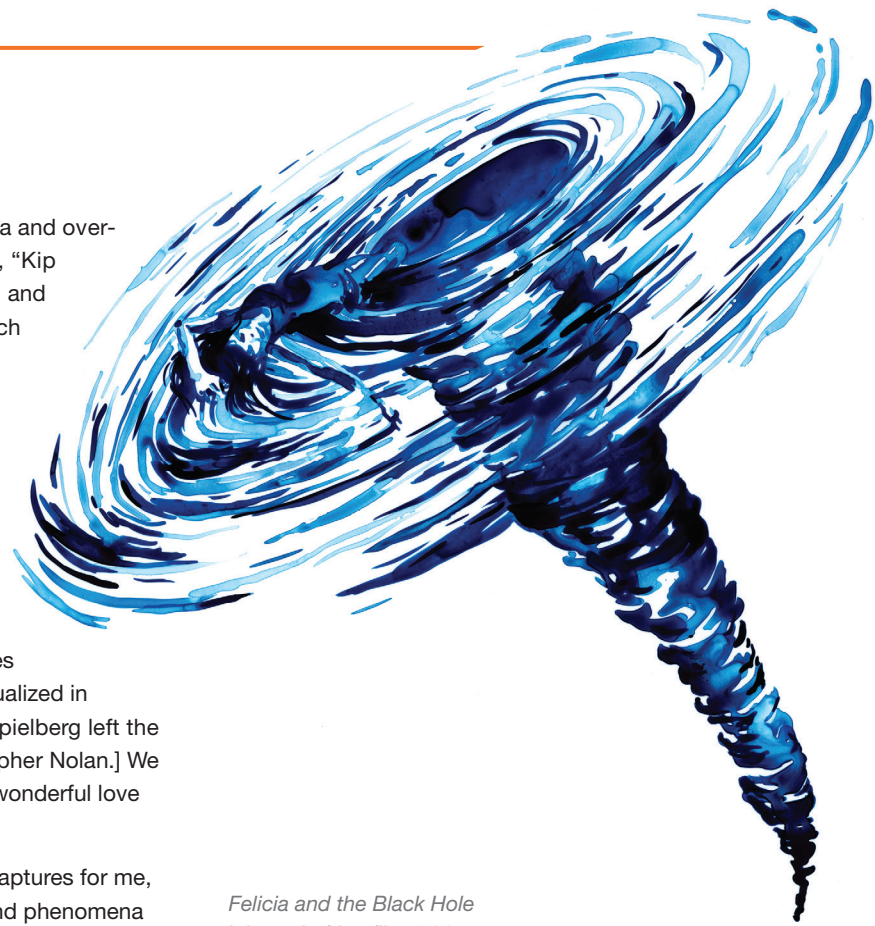
Then, in 2007, I was at a cocktail party in Pasadena and overheard someone say his name. I perked up and said, “Kip Thorne is here? I have to meet him.” I went up to him, and I was effusively and unapologetically sharing how much of an impact his writing had on my artwork. He said there was “a young filmmaker” interested in making a film about his science and perhaps I could help him visualize it. The director was Steven Spielberg. So we started this wonderful dialogue where Kip would come to my studio and talk, and then, after about 45 minutes, my head would get hot from the mind-blowing things Kip was describing about the universe, and I’d try to put his ideas into an image or even some very simple doodles. He used those doodles as a way to explain how time and space could be visualized in the early, early conception of the movie *Interstellar*. [Spielberg left the project in 2009; it was ultimately directed by Christopher Nolan.] We not only became collaborators but also developed a wonderful love and respect for each other.

Kip Thorne: In her paintings and pencil sketches, Lia captures for me, as well as for nonscientists, the essence of objects and phenomena that are made from warped spacetime rather than from matter: the warped side of the universe. That’s why her sketches were so helpful to me in my planning discussions for *Interstellar*, first with Spielberg and later with Christopher Nolan and his brother, screenwriter Jonathan Nolan. Lia’s creativity and skills as an artist, her enthusiasm and easy communication with me, and her familiarity with the essence of science make her a great collaborator.

Halloran: At one point, Kip was invited to write an article for *Playboy*, and he asked me to do the artwork. So, he wrote a 6,000-word article about black holes and wormholes, and I made eight little paintings. We sent it over to *Playboy* and got an email back saying that Hugh Hefner had rejected my artwork because it didn’t look like the iconic style of Leonard Nimoy’s drawings. Sometimes, failure is the best thing that can ever happen to you! We’d had so much fun working together that we continued meeting, me making paintings and Kip expanding his prose, until we realized we had a book on our hands.

Thorne: I had honed the prose of our *Playboy* article so it flowed nicely and had a nice ring to it. Then, when Lia’s friend did the first layout for our book, she broke some of my prose into stanzas. When I first saw this, it became obvious to me that what I had was almost poetic verse. The only verse I had written previously was love poems to my wife on her birthdays.

Halloran: At that point, Kip decided to rewrite all the prose into verse form. With so much of science, many people don’t feel like it’s theirs. But if we change the format, that can be a very different way to approach it. How many poems about black holes are out there? We really hope that the poetry community, the art world, and the physics community will all claim it as their book.



Felicia and the Black Hole
Ink on drafting film, 2017

Thorne: I hope to inspire readers of all sorts to see the weird and wonderful beauty of the warped side of the universe and to convey to them the ethos and essence of this strange bit of science. My words could not possibly do that by themselves. Lia’s paintings, tightly integrated with the words, are essential.

“I welcomed the move from the humanities classroom to the undergraduate dean’s office as an opportunity to support and work with students in new ways. What I have come to appreciate, too, is the extraordinary effort and commitment that goes into shaping the student experience at Caltech, particularly among student leaders and professional staff.”

— **Kevin M. Gilmartin**, *Caltech’s William R. Kenan, Jr., Professor of English and the current dean of undergraduate students, who has been named the Institute’s next vice president for student affairs*

Three Questions for: Danielle Wiggins

Danielle Wiggins, who joined the Division of the Humanities and Social Sciences (HSS) at Caltech as an assistant professor of history in the summer of 2019, earned her PhD in history from Emory University in 2018, where she specialized in African American political history and urban political economy.

1. In your work on Atlanta in the ’70s and ’80s, you have noted that the Black Democratic leaders adopted a surprisingly punitive approach toward crime. Why do you think that was the case?

Many folks have argued that people were just really afraid of violent crime and framed Black crime as a civil rights issue, as in, “We need to protect our good, law-abiding Black people from the lawless rule breakers who are betraying the race.” Others have argued that because the federal and state governments were also embracing a punitive law-and-order type of politics, those were the tools available to them. While they weren’t able to get much money to improve public schools or for public housing, they had a great deal of federal support for expanding police departments and jails.

2. Do you have a historical perspective to share on the current uprisings against police violence and systemic racism?

I study the period right after the urban rebellions of the mid-to-late 1960s and how cities and Black leaders, in particular, responded to those uprisings with various reforms that were intended to assuage tensions between Black communities and police departments. But, ultimately, as we now see, these reforms of the 1970s and the reforms that we saw again in the 1990s in response to uprisings in cities like L.A. and Miami were insufficient, and some of them actually worsened the problems of overpolicing in Black and brown communities and intensified mass incarceration. So I’m constantly thinking about the ways that we can learn from the mistakes of the past and how to inform and educate people about the limits of the reforms we’ve already seen.

3. What would you like to say to the Caltech community at this time?

I would say embrace those values that are at the heart of Caltech: creativity, innovation, and a belief that we can solve the world’s biggest problems. And ask yourself: What would a world where Black people don’t experience untimely death at the hands of police, from disease, or from neglect look like? What would a world where Black lives actually matter look like? These are things that are hard to imagine because we’ve never lived in such a world, but these are thoughts that should inspire us to continue the work.

Read the full interview at magazine.caltech.edu/post/danielle-wiggins



ESSENTIAL CALTECH

While the vast majority of Caltech staff and faculty spent the spring working from home due to the coronavirus pandemic, a small number of essential employees came to campus each day, operating under strict conditions set forth by health officials, to ensure that the Caltech community, broadly dispersed, could continue to pursue scientific exploration for the benefit of all.

Erica Crawford, Senior Residential Life Coordinator, Office of Residential Experience

Crawford lives and works in the Bechtel Residence. Her job is to provide personal, social, and academic support to students. “During this experience,” she says, “campus community members have really come together to try to make the transition as smooth as possible for everyone involved. The social-distancing requirements make it hard to interact with others who are still on campus, but we are working every day to continue to support students both on and off campus.”



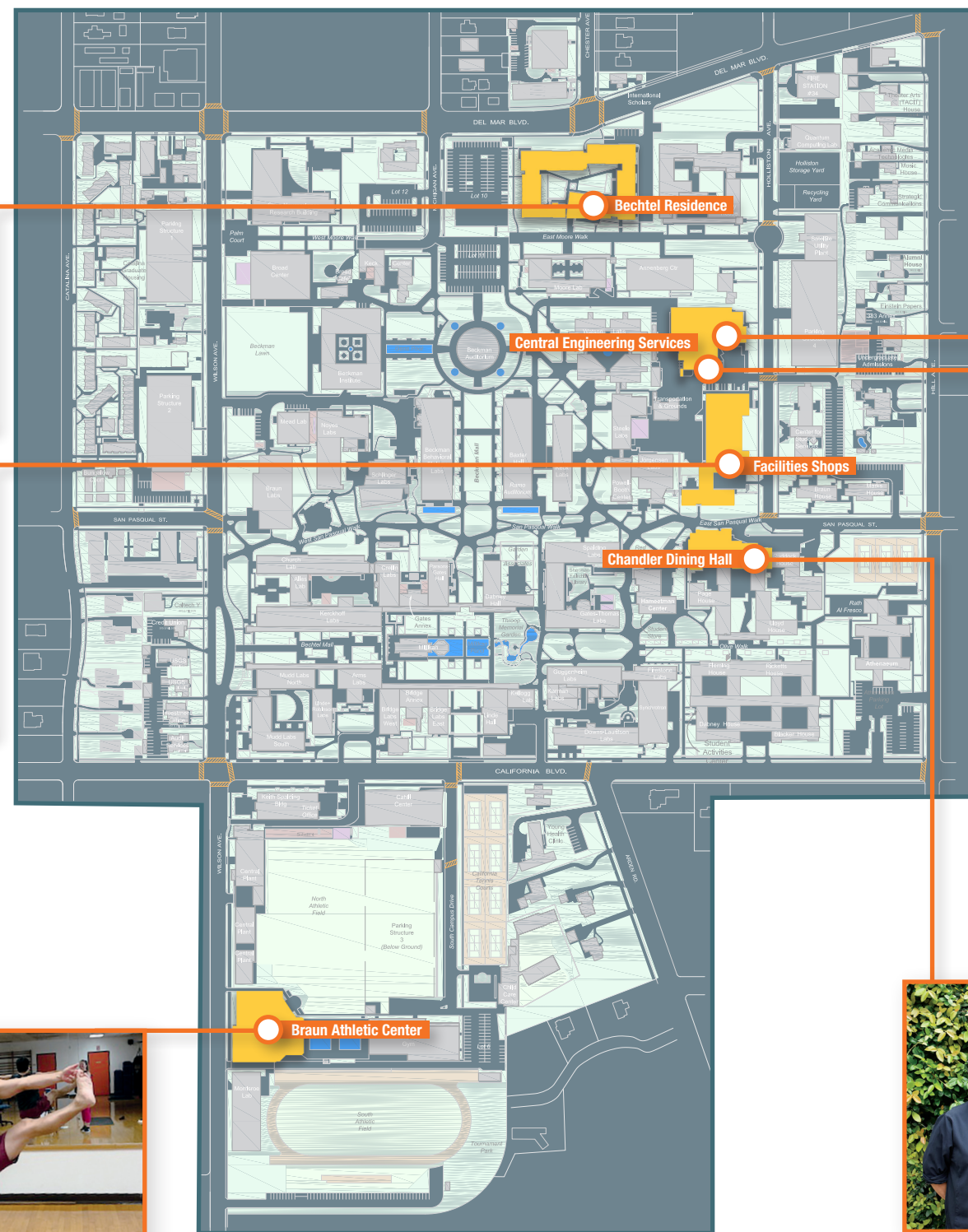
Corey Campbell, Materials and Services Supervisor

Campbell is responsible for ensuring the campus has enough of the essential supplies it needs. “I hope that my work allows critical research to continue and keeps the campus supplied and safe,” says Campbell. One thing that struck him during this pandemic is the number of rolls of toilet paper required.



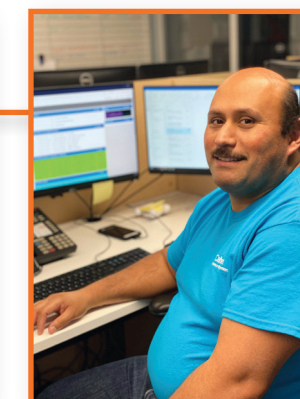
Jose Alvarado-Orozco, Yoga Instructor

Alvarado-Orozco, who has been teaching live Stretch & Flex classes every week via Zoom, says he has been struck by Caltech’s “willingness to keep us moving; the support system here never stops.” His message to those at home? “We are here for you, we show up to work, we are here to give you support. We want to know how you are doing and give you a sense of structure and stability during this uncertain time.”



Paul Ayala and Alex Hernandez, Building System Operators

Ayala and Hernandez monitor the building automation console for HVAC issues and manage service calls on campus. Used to sitting side by side in a busy service center, the two are now operating solo on alternating schedules. The quiet on campus has stood out for Ayala; he is used to a faster pace and looks forward to busier days when the full campus community returns. Hernandez, too, is looking forward to life getting back to normal but is happy to support essential research during this time.



Rick Germond, Lead Storekeeper

Germond is responsible for liquid nitrogen service on campus. “The current campus experience can be fairly stress-fraught, yet the knowledge that we’re working at an institution on the forefront of seeking to end our world-wide pandemic makes me and others around me glad to be able to contribute,” he says. What is Germond looking forward to most? “I’d love to once again stand in the middle of Chandler’s lunch-hour clamor and know all of us aren’t focused on the same infinitesimal virus!”



Sandra Padilla, Miguel De La Torre, and Martin Contreras, Dining Services

Caltech’s Dining Services staff never stopped cooking and serving meals to students and faculty who remained on campus. In late March, Dining Services also started offering cook-at-home meal kits (similar to Blue Apron) to all students, faculty, and staff.



Alexander Zlokapa (senior)

#SoCaltech is an occasional series celebrating the diverse individuals who give Caltech its spirit of excellence, ambition, and ingenuity. Know someone we should profile? Send nominations to magazine@caltech.edu.

Alexander Zlokapa, a physics major, is one of four Caltech students to receive a Barry Goldwater Scholarship for the 2020–21 academic year. The scholarships are awarded to college sophomores or juniors who intend to pursue research careers in science, mathematics, and engineering.

“COVID-19 has painfully changed the world more quickly than I could ever have imagined. With the support of the amazing Caltech faculty, I’ve helped organize a Caltech student effort as we attempt to make our communities safer, working with epidemiologists and virologists from institutions around the world while bringing the Caltech community closer together. A conversation with my adviser, physics professor Maria Spiropulu, encouraged me to contact biophysics professor Rob Phillips, who graciously offered to give both a public lecture on COVID-19 and a mini-course on viruses. Reaching out to students through the Caltech Data Science Organization, [a student club] that I lead, we had over a hundred people attend online to learn about

the critical problems we face today. Thanks to the enthusiasm and openness of Professor Yaser Abu-Mostafa in helping us develop a new section of an undergraduate computer science course, we’ve now been able to launch projects with hundreds more Caltech students and postdocs, building models that quantify the spread of the pandemic. As well as contributing to briefings for the director of the California Department of Public Health and working with scientists from Denmark to Bangalore on new COVID-19 testing strategies for hospitals, I also had a chance to put together some COVID-19 testing analysis that was reviewed by President Rosenbaum and Provost Tirrell as part of preparations for re-opening Caltech. It’s been very busy, but I’m always amazed at and encouraged by the dedication of everyone involved in combating the pandemic.”



For more **#SoCaltech**, go to tinyurl.com/MagSoCaltech

“The fact that both Caltech and the City of Pasadena were willing to act, and act decisively, on clear visions for their respective futures launched them on the trajectories that have landed us both here today. Pasadena is very proud of Caltech, our homegrown portal to the future and to the stars.”

—Terry Tornek, Mayor of the City of Pasadena, at the March 5 *Becoming Caltech* event held on campus to celebrate 100 years since the Throop College of Technology was renamed the California Institute of Technology

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