

# Natural Selections

A NEWSLETTER OF THE ROCKEFELLER UNIVERSITY COMMUNITY



PHOTO COURTESY OF JEANNE GARBARINO

The RockEDU Science Outreach team pre-pandemic. From left to right: Odaelys Walwyn, Jeanne Garbarino, Doublas Heigl, Disan Davis, and Elizabeth Krisch.

## RockEDU's Remote Outreach Makes Science More Accessible

AUDREY GOLDFARB

Science Saturday, Rockefeller's annual campus-wide festival of science education and exploration, is a gem of RockEDU's community outreach. Last year, as COVID cases began to spike in New York City, RockEDU was forced to pull the plug on Science Saturday after months of hard work, meticulous planning, and anticipation.

School closures and remote learning have increased the demand for online learning tools across the globe. Considering the major role of COVID researchers and policy makers in mitigating the pandemic, widespread science education and communication between experts and non-experts is particularly critical.

Jeanne Garbarino, director of RockEDU science outreach, took on the challenge of designing a virtual Summer Science Research Program

(SSRP). With years of experience doing outreach, expertise in designing and conducting experiments, and support from a team of scientists, Garbarino was prepared to develop and execute virtual "lab" experiences. Still, the year was a learning experience for her, too. "I don't think I've learned more in twenty years of engagement than I have in this one year of doing engagement," Garbarino said.

Without a physical lab space to work with, Garbarino used common household items to design experiments. Fortunately, this was familiar territory. She's notorious in her household for cultivating creatures in expired food, including a fungus-inhabited bottle of maple syrup. With Garbarino's guidance, students grew their own wild yeast and bacteria strains

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## A Message From The Natural Selections Editorial Board

Several recent, widely publicized attacks on the Asian American community have spotlighted the rise in anti-Asian sentiment and racism in America. This is not a sudden or new development, but the result of years of pernicious racism. We wish to express, in no uncertain terms, our support for and solidarity with the Asian American and Pacific Islander community. Racism will not be tolerated. Discrimination will not be tolerated. We stand together with #AAPI.

We invite you to use *Natural Selections* as a platform to share your thoughts and experiences regarding these issues. If you wish to submit a piece, we encourage you to contact our editorial staff. Now is the time to use our voices to lift up the Asian American and Pacific Islander community. ■

<https://stopaapihate.org/>



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PHOTO COURTESY OF JEANNE GARBARINO

JEANNE GARBARINO, PH.D., IN HER HOME LABORATORY.

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at home and precipitated DNA with isopropanol.

Making do without expensive equipment and reagents, Garbarino soon realized, had a silver lining. “I’m not letting my context confine what I can do,” she said. “That is the thing that made us connect with kids.”

Decentralizing the process of experimentation made science more accessible. “After participating in the SSRP Program, I am deeply aware of the fact that science is not a field only some have access to, but rather it is an endeavor that anyone can contribute to anywhere (even in their own homes!),” one student said.

Using a virtual platform, Jeanne and her team were less limited by material resources and space than they were previously. This allowed them to expand their cohort by 58%, accepting sixty-three students for 2020.

Bringing science into the home encouraged family members to engage as well. One student mentioned that her five-year-old sister began pipetting with a bulb syringe after observing her older sibling perform experiments.

The RockEDU team is also striving to incorporate new teaching philosophy into their programs. Garbarino challenges traditional research dogma by expanding her students’ understanding of scientific reasoning. Strictly hypothesis driven re-

search is not the be-all and end-all. For example, Garbarino said, classification and categorization are imperative and undervalued approaches to discovery. “The way that students are being taught the scientific method in schools is very linear and does not account for messiness or experimentation,” she said. “RockEDU is working to give students options in terms of ways of knowing.”

Further, the team is working to integrate wonder into teaching and discovery. “We’ve been going deep into social science literature around the concept of wonder for a mechanism of building competence in STEM,” Garbarino said. “The utility of science has overshadowed the wonder of science.”

This summer, RockEDU’s SSRP is going international. By teaching virtually, the team will be able to accommodate seventy students. They received over 800 applications from seven time zones, including applicants from Mexico, Korea, China, Turkey, and a dozen states in the U.S.

Reflecting on the year, Garbarino has no regrets. There was no handbook on doing outreach during a pandemic, but she leveraged her expertise and passion to achieve the best possible outcome. “I did not drop the ball and I’m proud of that.” ■

*Science Saturday this year will be held virtually on May 8. [Registration](#) is required to participate.*

## Culture Corner: Two of My Favorite Guitar Solos

BERNIE LANGS

I came to musical awareness at age five in the early 1960s when my parents played records on our home “hi-fi” system featuring the mellow folk songs of The Kingston Trio and The Tarriers, as well as soundtracks of their favorite Broadway musicals. Like many children and young people at the time, my interests in popular music shifted direction forever when the 1964 British Invasion led by The Beatles and The Rolling Stones took America by storm. In three short years, the music would exponentially grow increasingly complex and innovative and by decade’s end, the power of recorded music seemed to have infinite possibilities.

Jimi Hendrix is rightly considered a musical genius who expanded the possibilities of what the electric guitar could deliver in the dexterous hands of a Stratocaster-wielding, guitar-burning, psychedelic sage. His 1969 unaccompanied rendition of “The Star-Spangled Banner” at the Woodstock Festival is worthy of an essay of its own as an awe-inspiring performance of America’s national anthem, punctuated by the violent wails and mayhem of Hendrix’s guitar recreation of “the bombs bursting in midair.” That moment in music history might also be considered an emphatic, full stop end to that infamous decade of political, cultural, and social upheaval.

My favorite solo on an album by Hendrix appears on the double LP, *Electric Ladyland* released in 1968. “Voodoo Child (Slight Return)” is performed by his power trio, the Jimi Hendrix Experience, and is the last track on the last studio album recorded by the group. Hendrix died of a heroin overdose eleven months after *Electric Ladyland*’s release. Several famous musicians and vocalists died young in the late 1960s and early 1970s soon after releasing an album. Such collections are often scrutinized as the artist’s “final statement.” Jim Morrison’s final track with his band, The Doors, on *LA Woman*, “Riders on the Storm,” is a chilling tale akin to a short story written by a Los Angeles-based mystery writer. With “Riders,” the listener is not quite sure if murder is imminent and all of Morrison’s details and observations are chilling. Morrison, the so-called “Lizard King,” sings melodically in a voice doubled on the recording by a quiet, eerie,

rasping whisper:

*Girl, ya gotta love your man  
Take him by the hand  
Make him understand  
The world on you depends  
Our life will never end  
Gotta love your man, yeah...*

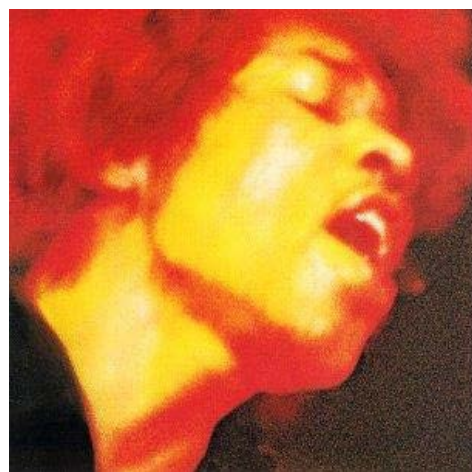
Morrison quit The Doors after recording *LA Woman* and it sounds as if he is bidding us *adieu* on “Riders” with his trademark emotionally detached intonations and poetry. He’d be dead in a bathtub in Paris within three months of the LP’s release.

Hendrix masterfully produced *Electric Ladyland*, and to realize the sheer sonic power and experience the full force of “Voodoo Child (Slight Return),” it is advantageous to listen with headphones either relaxed with eyes shut or in repose in the dark. Guitars swirl magically around the inner recesses of the mind as Hendrix solos, abbreviated chords and notes bouncing ear to ear, and somehow up and down, north to south, heaven to Earth. Hendrix’s guitar boasts perfected distortion and he whammy-bars his guitar at times as if entering a realm far beyond the daily pale.

One might speculate that Hendrix is prophesizing his approaching demise and worldly departure, yet the song is in no manner equivalent to, say, the pained vocal expression of imminent suicide by Kurt Cobain on Nirvana’s final track, “No Apologies.” Hendrix sounds like the liberated soul he’d always been as a musician and is now taking it one step further towards the beyond. It’s as if he’s declaring potential freedom from the body with exuberance, and with a chuckle to boot (observe his slightly self-amused delivery of the utterance, “uh”):

*If I don't meet you no more in this  
world then, uh—  
I'll meet ya on the next one  
And don't be late!  
Don't be late!*

In nearly all interviews with Hendrix filmed in the 1960s, he sounds positive, optimistic, energetic, and impassioned about life and music. To lose him to heroin



ALBUM COVER, “ELECTRIC LADYLAND” (1968)



COVER OF “GOODBYE CREAM” (1969)

is a crime and a shame. I wouldn’t define his death by overdose as a plea for help or an expression of life’s futility, akin to the depressive circumstances surrounding the death of Brian Jones of The Rolling Stones in 1969, who drowned while “inebriated” in his swimming pool. I would never condone the motto “live fast, die young.” I see Jimi Hendrix as a loving individual whose drug use ended up robbing his listeners, family, and friends of his presence and art. Listening to the lightning fast, electric runs on “Voodoo Child,” the fiery notes akin to brilliant white-hot sparks of ideas, one mourns what might have been had he not left us so tragically soon.

Speaking of power rock trios and speed of light guitar licks, the solo by Eric Clapton on “I’m So Glad” appearing on 1969’s *Goodbye Cream*, is my absolute favorite rock solo. *Goodbye* was the band’s

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PHOTO COURTESY OF WIKIPEDIA

PHOTO COURTESY OF WIKIPEDIA

fourth and final album and the first three tracks on it are live recordings from appearances by the group in 1968. In filmed interviews for the 2012 documentary *Beware of Mr. Baker*, director Ray Bulger's first questions to the intense virtuoso drummer of Cream, Ginger Baker (d. 2019) is along the lines of "What did you, Jack Bruce [bassist; d. 2014] and Eric Clapton have in common that made Cream so unique?" After ridiculing the stupidity of the question, Baker, who lived his life in a state of constant furious and bitter anger, shouts out, "*Time!*" and expounds on how each was blessed with an internal "gift of time."

"I'm so Glad," the nine minute-plus first track on *Goodbye*, has from my first listen as a twelve-year-old seemed impossibly conceived, since the manically paced guitar solo by Clapton, with his improvised diversions, long, short, soft, or loud, are met instantaneously by mirrored extrapolations on his themes by both Baker and Bruce. Cream metamorphoses as the song progresses into a three-headed, blindfolded monster sharing one brain as they wildly engineer a locomotive traveling at rocket speed. Bands such as The Grateful Dead, who also played "telepathically," would nod and smile at each other as they engaged in their musical universe of magic. When viewing the films of Cream, this trio of British chaps rarely glance at each other (with the exception of the 2005 reunion concert filmed in London where there are many lovely moments of endearing nods and smiles) and Bruce often plays with his eyes closed. Cream had the unity and mindset of the best of live jazz improvisation, and it is no wonder that Baker always referred to the group as a jazz band expressing the blues rather than a rock band of any kind.

There are so many fabulous solos in rock music history, including Jimmy Page's brilliant work on "Stairway to Heaven" (1971), Pete Townsend's powerhouse performance of "Young Man Blues" on The Who's *Live at Leeds* album (1970), and Alvin Lee with the band 10 Years After performing "I'm Going Home" at Woodstock. When the era of rock and roll guitar "gunslinger" soloing peaks in the 1970s, the technical speed of, for example, the

finale of Lynyrd Skynyrd's "Free Bird" (1973), feels as if the manic virtuosity is for the sake of itself with no meaning except to dance about madly at a concert or listen to while downing multiple brews at a bar. These purposeless solos epitomize the downright ignorant slogan, "Sex, drugs and rock and roll." Party on, Wayne!

Talents such as Jimi Hendrix, Jimmy Page, George Harrison, Peter Dinklage, Buddy Guy, Jerry Garcia, Carlos Santana, Jorma Kaukonen, and Jeff Beck (who re-

mains defiantly in a league of his own to this day) speak to their audience by communicating through their guitar phrases a vital expression of an inner state conceived and channeled through uniquely beautiful music. These artists and many others brought rock and pop music into the realm of joyful experience and created a newly found category within the arts, discovering a space where complex ideas and emotions find an overwhelming mode of powerful expression. ■

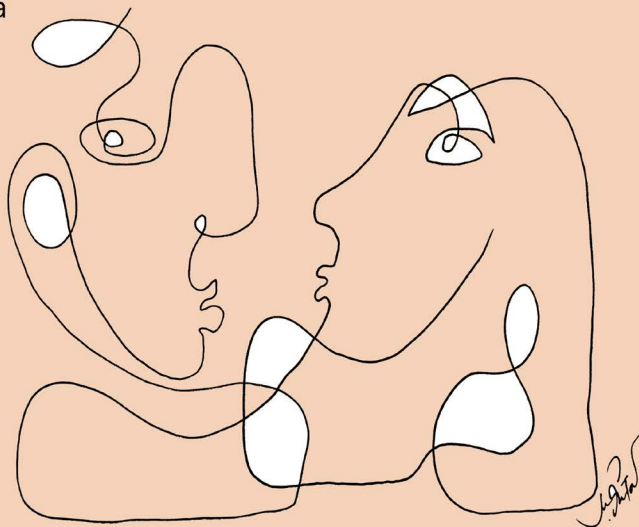
## New York Rhymes

KONSTANTINA THEOFANOPOULOU

### UNSUBSIDIZED LOANWORDS

Give me your spells  
 Unsubsidized  
 Feel the crest of my skin  
 Vibrations of my lips lie on your fingertips  
 in this irrational time  
 let your tears drizzle on my face.

by Konstantina



Poetry: Dr. Konstantina Theofanopoulou (Instagram: [@newyork\\_rhymes](#))  
 One line art: Mikaella Theofanopoulou (Instagram: [@m\\_theta\\_art](#))



## Pets of Tri-I

AUDREY GOLDFARB

This month I was lucky enough to meet Punxsutawney “Punx” Pill, a pill bug who currently resides with Camila Villasante, a Tri-Institutional M.D.-Ph.D. student, and Denis Torre, a Ph.D. student at Icahn School of Medicine at Mount Sinai. Per CDC guidelines, Punx preferred to perform the interview over Zoom. Although he is over 60 in pill years, the vaccine has not yet been approved for crustaceans. Punx’s reputation as a cute but astute pill preceded him, so I was a bit nervous going into the interview, but Punx’s keen demeanor immediately put me at ease.

**Audrey Goldfarb: It’s an honor to finally meet you, somewhat in person! To start off, could you tell me the meaning behind your name?**

**Punx:** On February 2, I was going for my usual morning walk. I started under my little rock, then came into the sunlight. Suddenly I saw my shadow! It scared me so much that I almost rolled into a ball. My humans, Camila and Denis, saw this, and named me Punxsutawney Pill Bug, “Punx” for short. Sorry everybody for the six more weeks of winter...

**AG: Wow, I’m glad Camila and Denis saw you before they stepped on you! How long had you known them before you introduced yourself?**

**P:** I’m a shy little bug, honestly. I really wanted to befriend Camila and Denis but was nervous they’d be scared of me. So, for a few months I crawled around the walls of their apartment to test the waters until they decided to adopt me!

**AG: Well, clearly you had nothing to worry about. But I heard you underwent a move a couple months ago, one of life’s most stressful events. How was that?**

**P:** Whew. I don’t have many belongings, being a pill bug, so thankfully the move itself wasn’t so bad. But the change of scenery was big. Denis had just made a terrarium full of goodies and tasty treats from Central Park (soil, decaying leaves, moss...great stuff). Moving from the barren apartment walls to a toasty greenhouse was actually great—and did wonders for my pores. I made fast friends with the two worms in my terrarium (courtesy of Irene Duba, Ph.D. fellow at Rockefeller).

**AG: You look like you’re in great shape. What’s your secret?**

**P:** Aw shucks, Audrey, thanks for asking! I’ve



PHOTO COURTESY OF CAMILA VILLASANTE



PHOTO COURTESY OF CAMILA VILLASANTE

been doing a lot of virtual pill-ates recently because I’m working on my pill-bod for pond season this summer.

**AG: Nice, I love the pond too! Maybe I’ll see you there sometime. Speaking of getting out and about this summer, do you consider yourself an introvert or an extrovert?**

**P:** As a pill bug, there is nothing I love more than curling up into a little ball. So, while it may seem like I’m an extrovert talking to you

Audrey, I am definitely an introvert!

**AG: I would have never guessed! What do you hope to check off your bucket list in 2021?**

**P:** I want to go on a pill-grimage to Pill-adelphia this summer. All my friends will be there.

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**AG:** Do you find the term “roly poly” offensive?

**P:** Frankly, the term alarms me a little bit. But at least it’s not “cheesy bugs” or “monkey peas” like they say in England.

**AG:** Noted. Switching the subject, do you have a traditional owner-pet relationship with Camila and Denis, or do you consider yourself independent?

**P:** My humans check on me from time-to-time, like last week when they found a centipede in my terrarium and vanquished it for me (So scary! So many legs!), but otherwise I’m a pretty independent pill.

**AG:** You certainly seem like you’ve got it all together! What are you planning to do with your stimulus check?

**P:** As an Upper East Side pill bug, I really want to get myself a pill-oton bike. I need to get a special bike with seven sets of pedals for all my legs, though—so it’ll cost me a small fortune!

**AG:** Are you single?

**P:** My humans keep asking me when I’m going to have grand-pills for them! But I’m just waiting for the right pill-partner to crawl by.

**AG:** I’m sure the ideal partner is out there for you, pill bug or otherwise. In the meantime, how do you unwind at the end of a long day?

**P:** By cracking open a nice, cold Pill-sner. ■

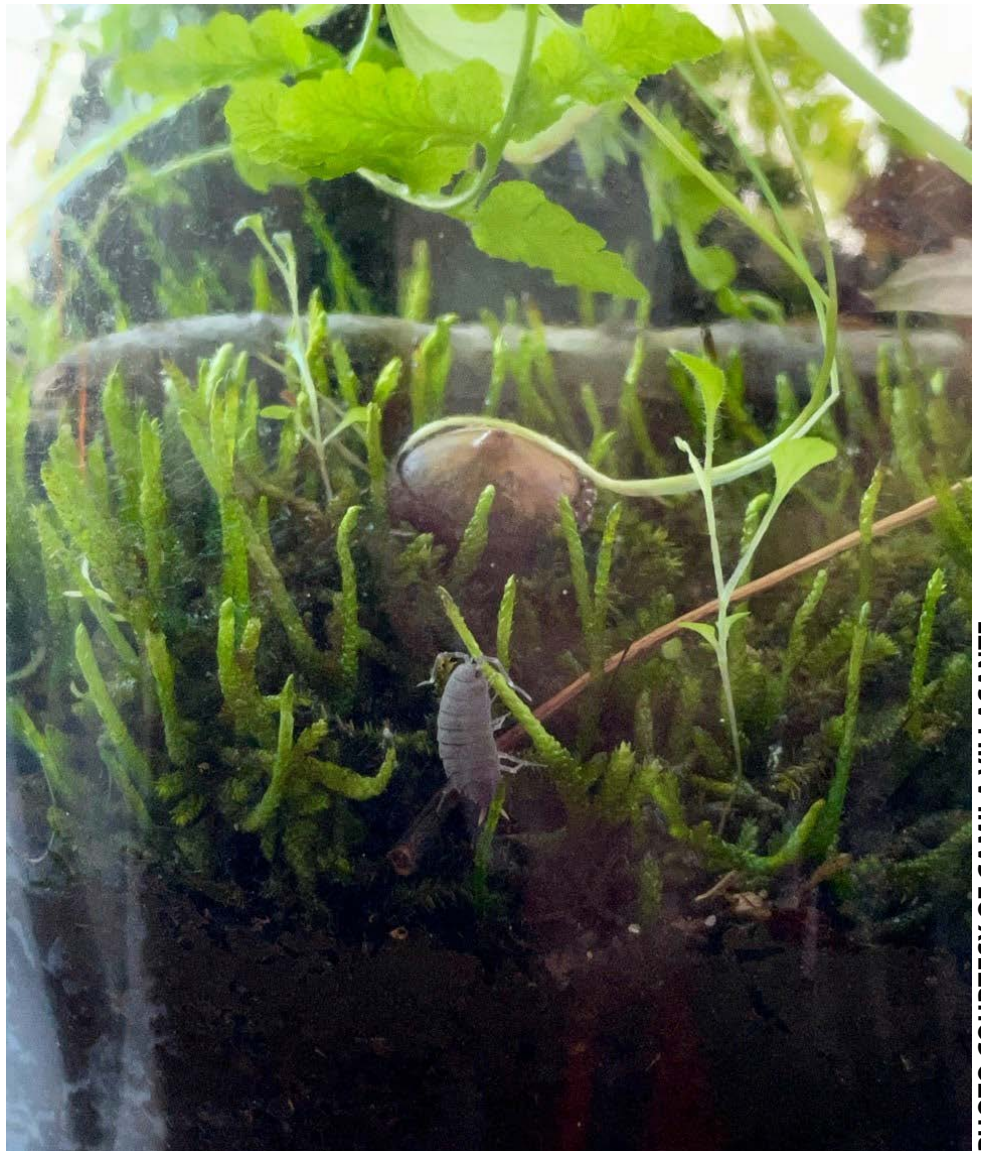


PHOTO COURTESY OF CAMILA VILLASANTE

## Natural Expressions

### Literature

Sofia Axelrod of the Young Laboratory at The Rockefeller University would like to announce the release of her recently authored book, *How Babies Sleep—The Gentle, Science-Based Method to Help Your Baby Sleep Through the Night*. Axelrod combined her experience as a parent with her research in the Young Laboratory as a neuroscientist to develop a method rooted in science for sleep training babies. Following its initial release in the United States last August, *How Babies Sleep* has been released in many countries around the world, including Italy last month, with more to follow in the coming years. *How Babies Sleep* is available for purchase [online](#) in paperback, eBook, and audiobook formats. ■

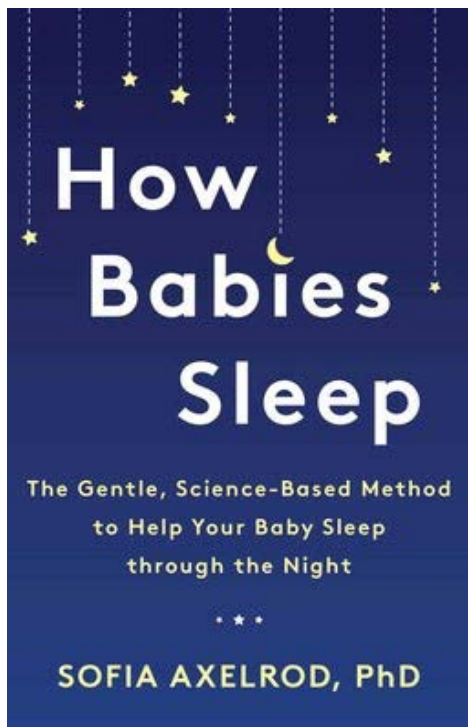


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