

SCIENCE, TRANSLATED



Technology
Health and Medicine
Society and Psychology

JUL 2023



Science, Translated

Making scientific discoveries
accessible to the world

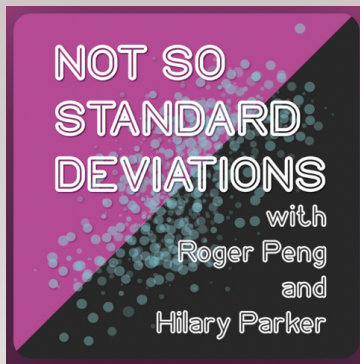
VOL 6

FAVORITE SCIENCE CONTENT OF 2023

Welcome back Science, Translators! This season, another fantastic group of articles was published and they will be in this newsletter. Before diving into those, we asked our members to share their favorite science media content this past year! Here's what they said:

Hidden Brain (Podcast)

Shankar Vedantam uses science and storytelling to reveal the unconscious patterns that drive human behavior, shape our choices and direct our relationships.



Not So Standard Deviations (Podcast)

Roger Peng and Hilary Parker talk about the latest in data science and data analysis in academia and industry.

The Academist (Podcast)

Rebecca & Jodi - two neuroscientists based in London - discuss with guests how inequality affects women and minorities in STEM, and ponder what we can all do to fix this as feminists in science.

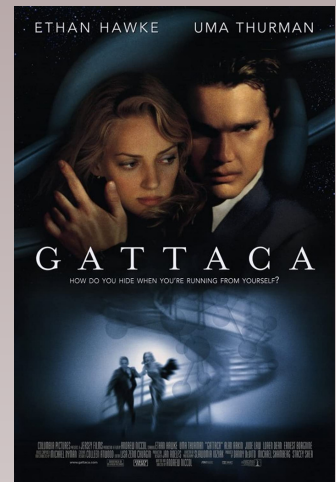


FAVORITE SCIENCE CONTENT OF 2023



Don't Look Up (Movie)

Two astronomers go on a media tour to warn humankind of a planet-killing comet hurtling toward Earth. The response from a distracted world: Meh.

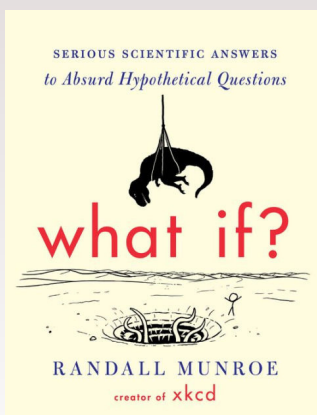
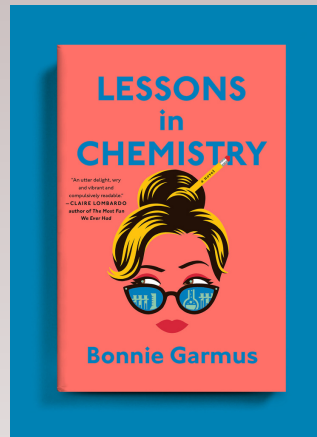


Gattaca (Movie)

A genetically inferior man assumes the identity of a superior one in order to pursue his lifelong dream of space travel.

Lessons in Chemistry (Book)

This bestselling novel by Bonnie Garmus follows the story of Elizabeth Zott, a brilliant chemist who is forced to become a television chef when she finds herself a young, single mother.



What If?: Serious Scientific Answers to Absurd Hypothetical Questions (Book)

In the New York Times best-selling book from the creator of the wildly popular webcomic xkcd, Randall Munroe gives hilarious and informative answers to important questions you probably never thought to ask.

FAVORITE SCIENCE CONTENT OF 2023



Denny Chin (@denny.the.scientist)
PhD | Sci Comm | 27
Microbiologist, Industry Postdoc
I post useful & relatable research content

Scieneers (@thescieneers)
Scientists + Engineers
Humanizing scientists & making academia
accessible



NileRed (YouTube)
Capturing the natural beauty of chemistry

Hank Green (Tiktok)
I might have taught you biology
(thecrashcourse.com)





NEW ARTICLES

Summer 2023 Writing Cycle

Chatbot Confessions: Complexities of Chatbot Architecture and Behavior

Jessica Liu

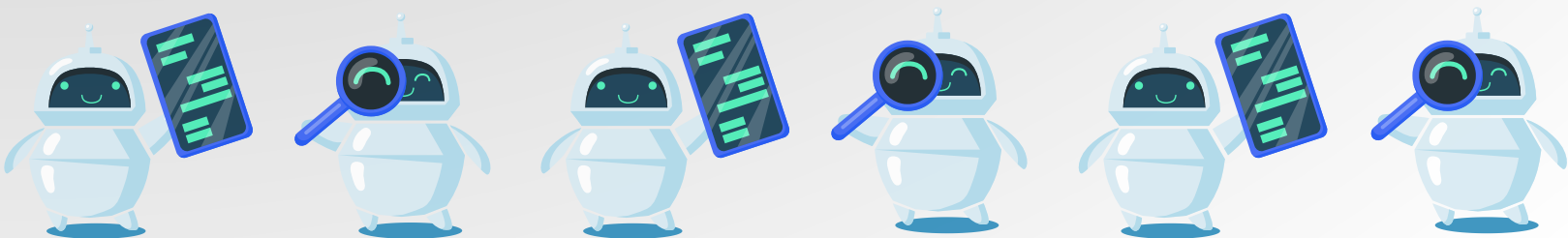
Chatbots - simultaneously a well of information, strange and unusual behaviors, and an insentient block of code. Beginning from the rudimentary ELIZA to the almost magical ChatGPT, chatbots have not only become chattier and 'smarter' but also more complex. However, the fundamental concepts of what makes a chatbot and its behavior has withstood (mostly) the test of time, revolving around natural language processing and generation. As technology and research into AI improves, the horizons of what chatbots can do -- and how they interact with users -- continues to grow brighter, leading to an untouched and unknown frontier that humans have yet to explore fully.



ChatGPT in the Classroom: The Good and the Bad

Nouran Amin

ChatGPT is an emerging language model that has become popular among students due to its ability to generate human-like responses. An attractive feature of ChatGPT is the instant feedback that complements students' learning needs and preferences, while the tool's accessibility allows for resources to be found in one place at no cost. However, ChatGPT lacks emotional intelligence, and its limited understanding and biases can impact the learning process. Even though there exists an array of pros and cons, ChatGPT should not replace educators but rather aid teachers and students in improving the learning experience.





Using Plants to Treat Cancer: Too Good to be True or Is There Promise?

Lior Boguslavski

We know plants provide a lot of healthful benefits when we eat them, but have you considered they have the potential to save your life? Cancer is a leading global killer with cases on the rise. Although there are a lot of effective treatments available, a lot of therapies come with severe side effects. Research has shown that specific plant compounds have the potential of providing less toxic cancer treatments. Plants have long been utilized in medicine for their healing properties, including their anticancer compounds, and they are versatile in that they can be used alone or part of a treatment regimen that may include surgery or radiotherapy. Plants have a variety of primary and secondary metabolites, which are organic substances created by the plant itself, that have been shown to inhibit cancer cell activity. The issue is that increasing global demand for plant therapeutics has threatened the biodiversity of many plant species; however, there is a potential solution outlined in this article to address this major concern.

Can Our Pets Talk to Us?

Grace Scheg



TikTok has seen the rise of "talking dogs" – dogs apparently communicating with their owners using push buttons labeled with words. But how plausible is it that our pets can actually communicate with us? As it turns out, our pets understand certain elements of human communication quite well. Dogs can distinguish between words spoken in a familiar language (the language their owner speaks) and words spoken in a foreign language, and cats can discriminate their name from other words. Dogs have also evolved to read non-verbal communication cues like pointing gestures exceptionally well, as these skills aided in hunting and herding during domestication. Yet dogs' human communication skills seem quite specialized. Dogs tend to ignore gestures not directed at them and fail to understand the informational value behind directive gestures. As such, there's currently no evidence to suggest that dogs – or other pets, for that matter – understand and utilize human language with as much complexity as a human.

A Dream Come True, On Rapid Eye Movement (REM) Sleep Behavior Disorder (RBD)

Audrey Ruan



Rapid Eye Movement (REM) Sleep Behavior Disorder (RBD) is a parasomnia that bridges the dreaming world with the waking one. RBD is an often alarming parasomnia that occurs during REM sleep, the stage of sleep during which dreams usually occur and most of the body is paralyzed. Instead of experiencing paralysis, however, a person with RBD will physically act out their dream episodes during sleep. They may dash up out of bed and fall to the floor, fight, crash through furniture, or even unwittingly harm their bed partner. This last, most dangerous factor, is the one which most often sends the RBD patient to a sleep clinic to be studied, diagnosed, and safely treated. In this article, we explore the clinical presentations of RBD, its link to the development of synucleinopathies, and provide a brief overview of relevant, current research and therapies.

Normalisation of Harmful Practices in Academia Affecting Students

Roha Muhammad



The toxic work culture surrounding academia, unrealistic expectations anticipated from students, and consequent unhealthy habits have become normalised in society. Such instances are leading to prevalent mental and physical issues in students, resulting in long-term concerns. Prevalent experiences of caffeine consumption, lack of sleep, and an unhealthy diet are common amongst post-secondary students, which studies have shown to have major disadvantages when it comes to being an academic. Poor academic performance, amongst other outcomes, has been examined for years, but there is little advocacy conducted for such issues. This article aims to examine how these practices are affecting students and how the glorified side of academia is feeding into such resulting outcomes.

Brains in a Dish: How Mini-Brains are Changing the Way Scientists Study the Brain

Ashley Yeh

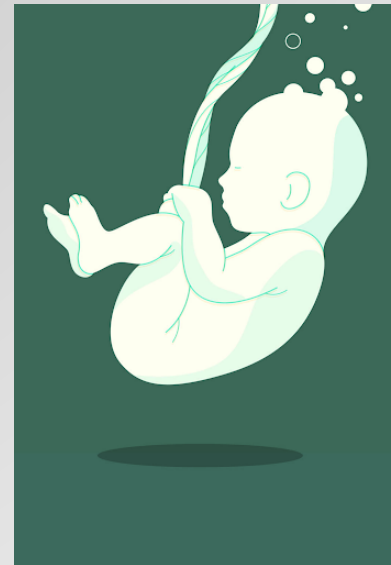
Brain organoids are lentil-sized clumps of neurons that can self-organize and function in a way that models the human brain. They are created by differentiating stem cells into neurons in a 3D configuration and allowing them to self-organize using specific nutrients and molecules. Brain organoids are useful tools for studying the development of the human brain, as they contain the same proteins, cell types, electrical activity, and cell layers as a fetal brain before the first trimester. They offer insights into the mechanism behind how the brain folds in on itself, which has implications for those suffering from brain folding disorders such as lissencephaly. Brain organoids are a promising avenue for studying the development of the human brain, as they provide an accessible and easily manipulable model to study brain development without the ethical concerns associated with studying fetal brain tissue.



Therapeutic Hypothermia as a Treatment for Neonatal Hypoxic– Ischemic Encephalopathy

Rupreet Kaur

A study conducted by Abate et al. (2021) aimed to investigate the impact of therapeutic hypothermia (TH) – a controlled decrease in core temperature – on moderate-to-severe hypoxic-ischemic encephalopathy (HIE) in neonates. Hypoxia is associated with subsequent increases in metabolic demands and the induction of hypothermia helps decrease these demands, including oxygen. However, the efficacy of this treatment, especially across varying economies, has not been fully explored. In this study, 28 randomized control trials were analyzed, with 20 using whole body cooling and 8 using selective head cooling. The overall relative risk of mortality with the treatment was found to be 0.74, indicating better survival rates in the TH groups. It was also found that, whilst effective throughout different countries, the mortality rates were more decreased in low and low-middle income countries. Thus, it was found that TH may minimize the progression of damage in HIE and serves as a promising potential treatment. However, it is important to analyze the costs and feasibility of introducing this treatment to hospitals.



What is Sexist Praise?

Nichelle Wong

Praise may seem innocuous, but women and female-presenting individuals must deal with an invisible obstacle: ambivalent sexism. This is the idea that women face two types of sexism: hostile sexism, which is directly derogatory, and benevolent sexism, which is indirectly harmful. An example of hostile sexism might be “I hate women”, while benevolent sexism manifests in comments like “You’re so smart/strong for a girl”. The latter is insidious because many

do not consider it discriminatory or sexist, instead believing it acts as a positive affirmation of women’s abilities. However, it does hurt women’s mental state, as it undercuts women’s abilities and achievements by focusing on their stereotypical qualities. Ever since Susan Fiske and Peter Glick’s original work on this subject, researchers have been exploring the different forms of ambivalent sexism as well as its effects.



Highly Diverse: 20% Women

Allison Cartee

As a female undergraduate at a national physics conference, I stood out amongst the sea of male faces. Yet, it’s no surprise women and minorities experience underrepresentation in the physics field. Though my introductory classes boasted

equal or greater-than-equal proportions of female students, I watched my peers exit upper-level math and physics courses until I found myself in a 17% female lecture. With this lack of gender representation, the physics field presents also struggles to recruit and retain talented underrepresented minorities. Using a few surveys from the National Institute of Health, I quantified the proportions of female and minority graduates of bachelor’s and doctoral programs. I present literature and practical strategies to improve diversity in the field. Bringing these issues and some of their solutions to light will help deliver a more inclusive future – one where we all can see our faces and identities reflected in its leadership and accomplishments.

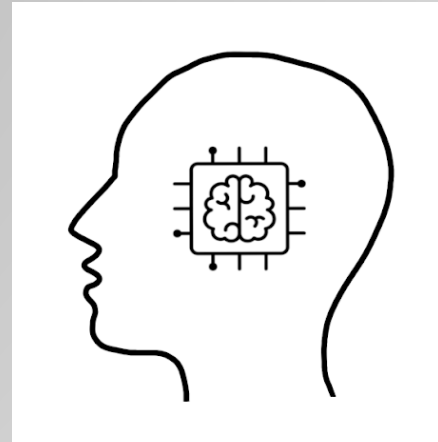




With Great Power Comes Great Responsibility: How AI Can Help Solve Mental Health Mysteries

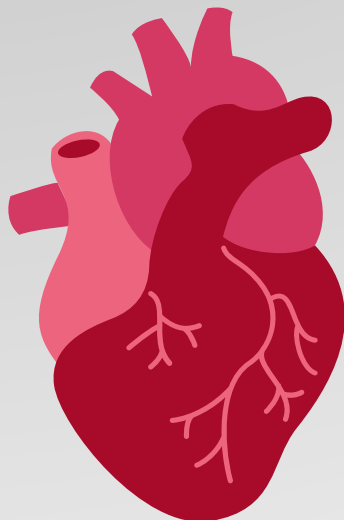
Rebecca Lee

The rise of artificial intelligence (AI) programs like ChatGPT has led us to anxiously wonder how the future may be run by machines. Though in reality, developments in these AI programs are set to improve our lives for the better. The human brain remains one of life's most complex puzzles. Though with a powerful information processing tool like an AI system, we have the potential to solve pieces of this puzzle and use it in medical treatment. With mental illness continually on the rise, advancement in AI may be one of the final pieces of the puzzle.



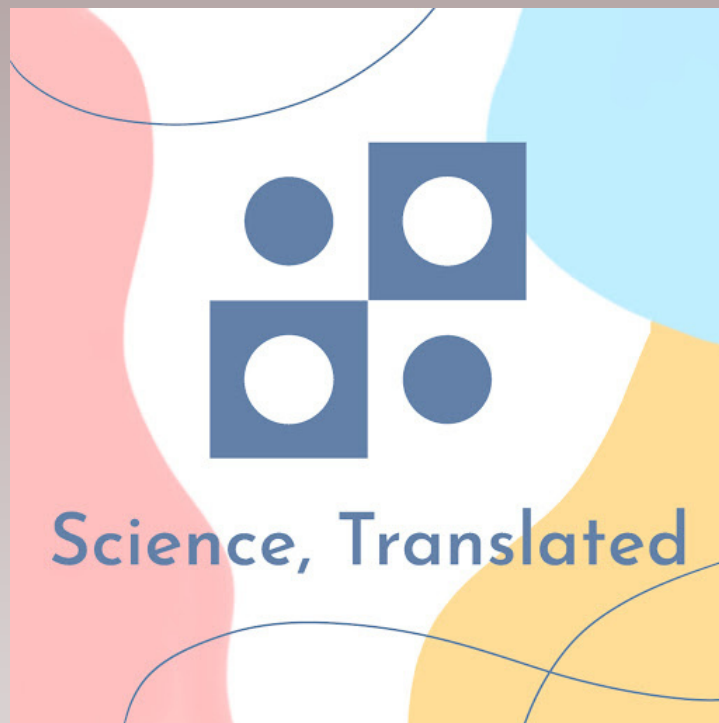
South Asians and Heart Disease: How Experiencing Anxiety, Depression, and Anger After Discrimination Can Deteriorate Health

Nyah Moliere



Heart disease has been a leading cause of death in the U.S. for some time, but what's lesser known is that South Asians (Indian, Pakistani, Bangladeshi, Nepali, and Sri Lankan people) are significantly more prone to it. The MASALA Study is a collaborative investigation on exactly why heart disease is more likely in South Asians from a variety of perspectives, from cultural to biological to psychological. They recently published a study showing that discrimination can lead to psychological distress, which in turn deteriorates measures of heart health like cholesterol and alcohol and tobacco use. This suggests that it would be beneficial for medical professionals to be aware of racial differences in health and the reasons why they happen.

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