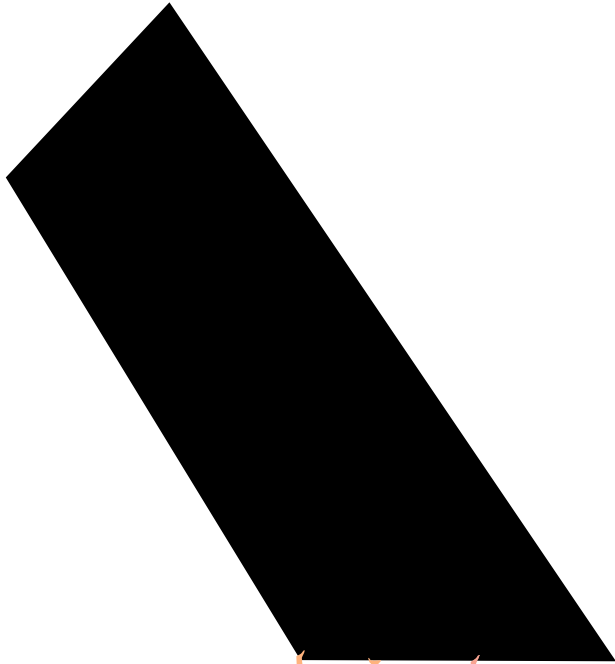
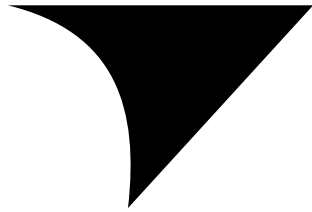




knowable MAGAZINE
FROM ANNUAL REVIEWS



**IMPACT
REPORT** 2022



November 2022

Dear friend of *Knowable Magazine*,

Earlier this year, I attended a conference that highlighted a number of science success stories: Moderna cofounder Robert Langer discussed the drug delivery research he had done that led (some 50 years later) to one of the Covid-19 vaccines now protecting millions of people from serious disease; Robert Braun of the NASA Jet Propulsion Laboratory shared plans for the first mission to return rock and soil samples from Mars; Kevin Lynch of Northwestern University described his group's work on creating "cobots" that would harness robot technology and neuroscience to create mind-controlled prostheses. It was a bit breathless, but convincingly so.

And yet, the first discussion was on the decades-long decline of US federal funding for basic science research — despite its utmost importance to the creation of such new marvels. While philanthropies have stepped in to boost research dollars, the speakers, including Marcia McNutt, president of the National Academy of Sciences, lamented the loss of support for the kind of exploratory, curiosity-driven and high-risk research that can drive scientific progress.

As the editor in chief of a science magazine that seeks to inform readers about scientific progress, and the great unknowns that lie beyond our advances, I was struck by the discussion. You would think that the unbelievably fast development of effective vaccines against Covid would perfectly illustrate just why basic research is something worthy of society's encouragement and dollars. The issue, I tend to think, is a lack of understanding of how science works, and how the vaccines were built from the bricks of much more incremental, less lauded discoveries.

What *Knowable Magazine* from Annual Reviews does is make such understanding accessible to all — by translating the language of specialists, by creating explanatory graphics, by including context, by exploring how scientists know what they know and, best of all, by making all of our content free to read. We go one step further still, and actively seek to share our content with other media outlets so that readers of the *Washington Post*, *BBC Future*, the *Atlantic*, *Scientific American* and, with the introduction of *Knowable en español*, readers across the Spanish-speaking world also have access to high-quality, fact-checked science journalism.

Much like the research we cover, creating a science magazine (even a digital one!) carries costs, but costs we think are well worth the product. And we cannot do all the things we do without your support.

On behalf of *Knowable Magazine* and Annual Reviews, I thank you for your continued support of our publication. Read on and learn more about what your generosity has enabled in the last year, and of exciting new endeavors on the horizon.



Sincerely,
Eva Emerson
Editor in Chief
Knowable Magazine from Annual Reviews

Stats and facts

CONTENT PUBLISHED

(articles, videos, comics and podcasts)

TOTAL: 577

LATEST YEAR: 118

REPUBLICATION AND SYNDICATION

TOTAL: 1,029

LATEST YEAR: 374

PARTNER TRANSLATIONS

TOTAL: 111

LATEST YEAR: 93

READERSHIP

PAGEVIEWS

TOTAL: 9 MILLION

LATEST YEAR: 2.6 MILLION

PAGEVIEWS + REPUBLISHED VIEWS

TOTAL: 22 MILLION

LATEST YEAR: 7.4 MILLION

NEWSLETTER SUBSCRIBERS: 50,000

Total: October 26, 2017 to June 30, 2022

Latest year: July 1, 2021 to June 30, 2022

Republished views include estimated readership for partners who do not provide data

Recent awards and recognitions

2021 AMERICAN SOCIETY OF JOURNALISTS AND AUTHORS ANNUAL WRITING AWARDS

EXCELLENCE IN REPORTING

Winner: [Pencils down: The year pre-college tests went away](#)

THE BEST AMERICAN SCIENCE AND NATURE WRITING 2022

Featured: [Heads up! The cardiovascular secrets of giraffes](#)

THE NEWSWOMEN'S CLUB OF NEW YORK FRONT PAGE AWARDS

BEST SCIENCE REPORTING

Winner: [The truth about lying](#)

2021 EDDIE AND OZZIE AWARDS

SERIES OF ARTICLES — CONSUMER, NEWS, SCIENCE & TECHNOLOGY, GENERAL INTEREST

Winner: [Reset: The Science of Crisis & Recovery](#)

ILLUSTRATION — CONSUMER

Winner: [Scratching away: The complexities of chronic itch](#)

NEWSLETTER

Honorable mention:

[Knowable Magazine Newsletter](#)

LONG-FORM FEATURE CONTENT

Honorable mention: [Recycling meets reality](#)

SINGLE ARTICLE — CONSUMER OVERALL/ SPECIAL INTEREST

Honorable mention: [The truth about lying](#)

VISUAL STORYTELLING

Honorable mention: [Coronavirus evolving: How mutations arise and new variants emerge](#)



Republishing and translation

From the start, we knew that we could multiply the impact of our content by allowing other media outlets to republish our work for their established, curious audiences. But while many publishers use syndication as a revenue generator — charging other outlets to reuse content — thanks to your support, we provide this content for free, enabling millions of curious readers around the world to enjoy our fact-checked, evidence-based science coverage.

All *Knowable Magazine* articles publish under a Creative Commons license, and we actively work to place our articles in publications both domestic and international. Our partners include large, broad-interest publications like the *Atlantic* and *PBS NewsHour*, science and technology publications like *Smithsonian Magazine* and *Ars Technica*, and specialist publications like *ASBMB Today* and *Botany One*. We have entered translation agreements with select media outlets, and certain articles are available in French, Chinese and Arabic.

Based on data provided by our republication partners, we estimate that we have doubled the readership of our content over the last five years. In the 2021-22 fiscal year (July 2021-June 2022), we estimate that readership *tripled* thanks to republication and translation partnerships.

“ We love the science and innovation features that *Knowable Magazine* publishes. Their well-written takes on fascinating subjects have helped us round out our own science coverage. Our readers love the articles too, on everything from the quest to understand long Covid to tracking the deepest-diving creatures in the oceans. We greatly appreciate our partnership with *Knowable*. ”
—Joe Spring, science editor, *Smithsonian Online*



EXAMPLES OF REPUBLISHED ARTICLES AND MEDIA PARTNERS

The Atlantic [The tale of the domesticated horse](#)

BBC Future [Tackling the growing problem of overmedication](#)

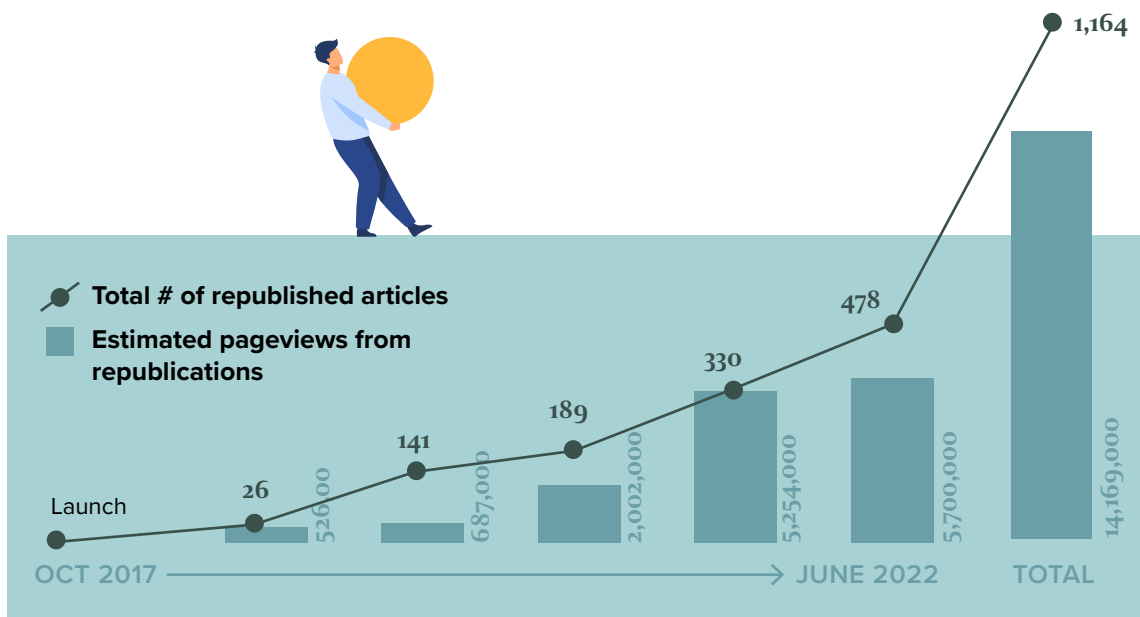
Slate [The race against radon](#)

Ars Technica [Spiders are much smarter than you think](#)

Smithsonian Magazine [Fun facts about bones: More than just scaffolding](#)

OUR WORK HAS APPEARED IN:





Introducing: *Knowable en español*

This year we expanded our international offerings with a Spanish-language edition. *Knowable en español* includes translations of existing *Knowable Magazine* content as well as original commissions that are written in Spanish and then translated into English for readers of both languages to enjoy.

This new effort is helmed by Debbie Ponchner, a seasoned science journalist based in Costa Rica. Before joining *Knowable Magazine*, Ponchner created the first daily science section of Costa Rica's leading newspaper, *La Nación*, headed the Spanish-language website of *Scientific American*, and wrote, edited and translated texts for an array of publications, including *Investigación y Ciencia* and the *New York Times*.

This initiative is made possible thanks to the generosity of the Gordon and Betty Moore Foundation and Annual Reviews.

BECOME AN EARLY READER OF *KNOWABLE EN ESPAÑOL*

- Newsletter <https://es.knowablemagazine.org/newsletter-signup>
- Facebook facebook.com/RevistaKnowable
- Twitter twitter.com/RevistaKnowable
- Instagram instagram.com/RevistaKnowable



Interested in republishing our work?

Our republishing guidelines are available at knowablemagazine.org/republish.


For more information, please contact:

- English/other languages: Katie Fleeman kfleeman@annualreviews.org
- Spanish: Debbie Ponchner dponchner@annualreviews.org

Select media mentions

“Some of the things we write can profoundly affect people’s actions, especially in health and medicine, says Rosie Mestel, the executive editor of *Knowable Magazine*. ‘There are a lot of people who are desperate and very sick,’ she says, ‘and you have to be very, very careful that you’re not going to be misleading people and overplaying things.’ ”

—“*Critically Evaluating Claims*,” by Megha Satyanarayana, *the Open Notebook*




The Open Notebook:
[Critically Evaluating Claims](#) (also appeared in [NiemanLab](#))

NPR Shortwave Podcast:
[Liquid Gold: The Wonder Of Honey](#)

Freedom With Writing:
[Interview with Rosie Mestel, Executive Editor of Knowable Magazine](#)

Flipboard Science Desk:
[Chernobyl Could Be an Environmental Catastrophe in Russia-Ukraine Conflict](#)

LinkedIn News:
[A bright red dye, without dead bugs](#)



NEWSLETTER MENTIONS

[STAT Morning Rounds](#)

[Numlock News](#)

[MIT Technology Review: The Download](#)

[OpenMind](#)

[Spectrum: Spotted Around the Web](#)

[FERN’s Friday Feed](#)

[JSTOR Daily Suggested Readings](#)

[Hakai Magazine](#)

[1440](#)

[Morning Brew](#)

Giving back

The staff of *Knowable Magazine* believes in being good colleagues and mentors in the larger science journalism community. In October 2021, *Knowable* was a sponsor and content partner for the Science Journalism Forum, an online conference serving an international audience of science journalists and editors. *Knowable* presented a panel on the use of academic reviews as resources, and executive editor Rosie Mestel joined an editor roundtable organized by the *Open Notebook*. As a travel grant sponsor, *Knowable* provided support for the registration fees of over two dozen attendees from Latin America.

Additionally, for the past five years, *Knowable* has hosted a paid science journalism internship for a period of 10 weeks. Our interns have gone on to work for *Science Magazine*, *STAT*, San Diego Museum of Natural History, Johns Hopkins University Applied Physics Laboratory and *Report for America*.

Content highlights



CLIMATE CHANGE

Climate change remains a staggering crisis facing the peoples of the globe. In our effort to contribute to greater understanding of both the challenges posed by a warming world as well as adaptations and potential solutions, *Knowable Magazine* has made this an ongoing priority in its coverage.



COVID COVERAGE

As the world continues to weather the Covid-19 pandemic, *Knowable Magazine* has explored a broad array of issues relating to the virus and its societal repercussions.

[Many mangrove restorations fail. Is there a better way?](#)

Katarina Zimmer takes a fair but critical look at the perverse incentives, shoddy practices and disregard for local communities that doom many mangrove-planting projects, and showcases evidence-based approaches to restoring these essential coastal forests.

[The race against radon](#)

Melting permafrost is uncovering layers of a radioactive, cancer-causing gas, reports Chris Baraniuk, potentially putting the health of millions of people in Arctic and sub-Arctic communities at risk.

[A lifetime of climate change](#)

Nicola Jones's ambitious profile of researcher Arun Agrawal journeys through 60 years of landmark moments in research and policy through the lens of one climate change scholar's life and career.

[What will history say about Covid? Museums scurry to collect — and prepare to remember.](#)

Karen Emslie explores the real-time “curation” of the pandemic, as museum experts and citizens alike documented the unfolding crisis. While such curation usually occurs with the benefit of hindsight, in the case of Covid, professionals and the public leapt into action in real time.

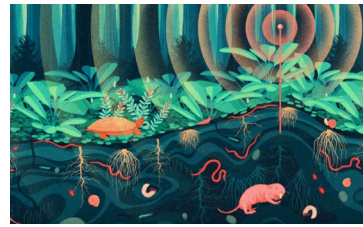
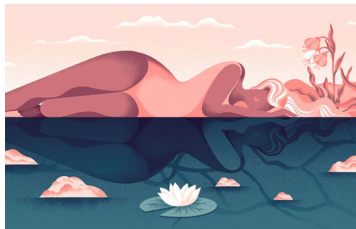
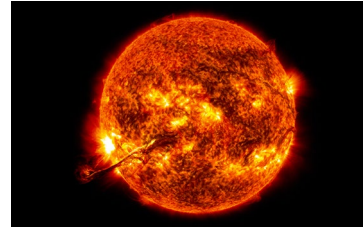
[Pencils down: The year pre-college tests went away](#)

Amber Dance, a regular contributor to *Knowable*, examines the impact of the pandemic on standardized testing and the future of higher education. This report won the American Society of Journalists and Authors 2022 Annual Writing Award for Excellence in Reporting.

[To understand airborne transmission of disease, follow the flow](#)

Discussing how the SARS-CoV-2 virus and other pathogens may travel in the air, fluid dynamicist Lydia Bourouiba speaks with science journalist Anil Ananthaswamy about her work mapping the flight of airborne diseases between people, around rooms and from the toilet.

Content highlights



ESSENTIAL FACTS

[Fun facts about bones:
More than just scaffolding](#)

[Chloroplasts do the darndest things](#)

[Bee gold: Honey as a superfood](#)

[The tale of the domesticated horse](#)

SCIENCE AND SOCIETY

[Tackling the growing problem of overmedication](#)

[Can ranked-choice voting heal our poisoned politics?](#)

[When depression sneaks up on menopause](#)

[Lyme and other tick-borne diseases are on the rise. But why?](#)

AWE AND WONDER

[Are we ready?
Understanding just how big solar flares can get](#)

[Spiders are much smarter than you think](#)

[Speaking in whistles](#)

[Life in the soil was thought to be silent. What if it isn't?](#)



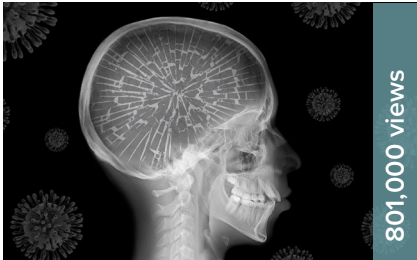
Multimedia



[Long Covid: A parallel pandemic](#)

“These stories are accumulating within me and drive me really to do more research and to try to find something that we can do to help the suffering of these people.”

—Akiko Iwasaki, immunologist



[Covid and the brain: A neurological health crisis](#)

“I’m not an epidemiologist. I’m not a virologist. I’m a neurologist. But I am alarmed by the neurological possible consequences of this pandemic and alarmed by the neurological disease that’s already evident in many, many, many survivors of Covid.”

—Michelle Monje, neuroscientist



[Covid-19: Origins of an outbreak](#)

“We know that in the viral families that are known to cause human disease and be shared with other animals, that there are at least 500,000 viruses still to discover that can infect us and could make us sick. We’ve only scratched the surface.”

—Jonna Mazet, epidemiologist



[Why Covid-19 testing went so wrong in the US, and what to do now](#)

“In the United States, one of the major problems in the response to the pandemic started right at the start with testing. You cannot tell where the virus is or if somebody’s infected with it unless you test for it.”

—William Hanage, epidemiologist



[Covid’s main lesson? For this journalist, it’s unpredictability](#)

“To my mind, the scariest thing about delta is not even delta itself; it’s the reminder that we are not done with this virus — that we are going to keep seeing variants and there may be something worse than delta around the corner.”

—Apoorva Mandavilli, science reporter



[Can a fire-ravaged forest of Joshua trees be restored?](#)



“Additional climate change in the direction of more extreme heat and drought could potentially be catastrophic for some plants.”

—Bruce Baldwin, botanist

Podcast

When we talk about science, we often focus on the best information available today. In doing so, we risk leaving out the “how” of that knowledge — the process of science itself and the often-winding paths, misconceptions, missteps and surprises that got us to here. In this series, award-winning journalists Charlotte Stoddart and Adam Levy follow these twists and turns, combining interviews with contemporary experts, quotes from historical research and a rich audio landscape.

By focusing on the journey, the *Knowable* Podcast reveals how science operates, humanizes the people who led the way and shows what evidence and critical thinking look like. Retracing these steps also makes clear that scientific discovery has no end destination but is the continuous asking of questions—then following wherever the answers may lead us.

Co-host Charlotte Stoddart was interviewed on the podcast “Wickedly Wise Women Entrepreneurs.” [Listen now.](#)



Listen now

[The science of dreams](#)

[The search for exoplanets](#)

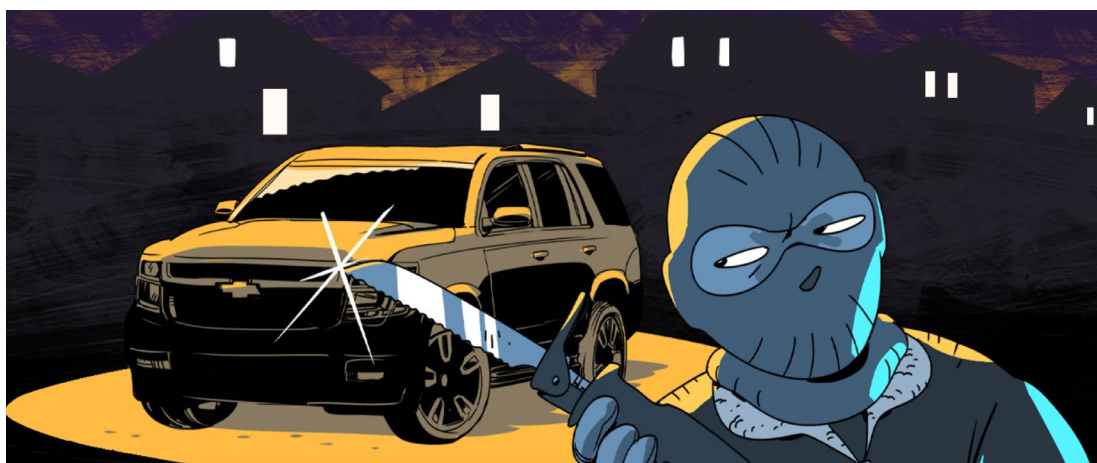
[Structural biology: How proteins got their close-up](#)

[The history of climate change offers clues to Earth's future](#)

[How particle accelerators came to be](#)

[How antidepressants changed ideas about depression](#)

Comics



[Why do thieves keep stealing catalytic converters? It's elemental](#) Developed in collaboration with the *Nib*, this illustrated piece explains the rise in catalytic converter theft.

Scientist-authored opinion pieces

In addition to our rigorous science journalism, *Knowable Magazine* publishes expert-written commentary pieces that provide unique, fact-based insights into pressing social issues. Scientists spend years — decades, even — amassing evidence that could help solve problems like gun violence, climate change and infectious disease, and they have a lot to say that is of value to the general public. We work with such experts to craft clear, cogent and jargon-free opinion pieces that provide readers with solid scientific information and fascinating perspectives. We work hard to place them in places where people will encounter them, and these op-eds have appeared in a number of different publications, including *Business Insider*, the *Atlanta Journal-Constitution* and *Scientific American*.

OP-EDS PUBLISHED JULY 2021 – JUNE 2022 AND WHERE THEY APPEARED:



This myth about guns is killing us

Author: Mark Rosenberg

Republished by: *Atlanta Journal-Constitution*

Read more: [Annual Review of Public Health](#)

Pandemic psychology: Nothing new under the Sun

Author: Steven Taylor

Republished by: the *Intellectual* (Zhi Shi Fen Zi)

Read more: [Annual Review of Clinical Psychology](#)

How racism in early life can affect long-term health

Author: Jack P. Shonkoff

Republished by: *Scientific American*

Read more: [Annual Review of Public Health](#)



Let's change how we pay for hospitals

Author: John Colmers and Sherry Glied

Republished by: *Business Insider*, *Medscape*

Read more: [Annual Review of Economics](#)

The first malaria vaccine is a leap forward, but we can't stop now

Author: Matthew Laurens

Republished by: *Medscape*, the *Wire*

Read more: [Annual Review of Microbiology](#)



Make electric vehicles affordable for the rest of us

Author: Tamara Sheldon

Republished by: *Business Insider*, *Inverse*

Read more: [Annual Review of Resource Economics](#)




Online events


Another exciting offering from *Knowable Magazine* is our online event series, produced in partnership with our colleagues at Annual Reviews. We first started offering online events as part of our Covid-19 pandemic coverage and — thanks to new funding from the Gordon and Betty Moore Foundation — they are now a permanent part of *Knowable Magazine* and Annual Review’s public outreach.

These events offer audiences around the world a unique opportunity to listen to fascinating, in-depth conversations with leading experts on anything from the workings of the brain to the evolution of the Grand Canyon. We encourage audience questions, and the chat is always lively and engaged, as viewers chime in with their own perspectives and resource suggestions.


In March 2022, science journalist Emily Underwood was brought on board to shape the series and develop content for future events.




EVENT | SOCIETY
Behind bars: The invention of mass incarceration
VIDEO: In the US today, prisons are an entrenched part of the criminal justice system, yet they are a relatively modern way of dealing with crime. How have society's attitudes toward punishment shifted over time and why does it matter? Join us for a free online event on Wednesday, March 23.




EVENT | SOCIETY
The psychology and politics of conspiracy theories
VIDEO: In the past year, conspiracy theories have had a big impact on politics and public health. What makes them so appealing? How can we disrupt their influence? Join us to explore these issues and more.




EVENT | HEALTH & DISEASE
A path to Covid-19 vaccine equity
VIDEO: When can the people who still need a Covid-19 vaccine expect to get one? Delve into the supply, distribution and political issues delaying global access to a lifesaving, economy-rescuing marvel.




EVENT | HEALTH & DISEASE
Viral variants: From Covid to the flu
VIDEO: Some variants of SARS-CoV-2, such as Delta, will drive new waves of COVID-19 infections. What can previous studies of the flu, HIV and SARS tell us about the course that this pandemic may take?




EVENT | PHYSICAL WORLD
The origins and future of the Grand Canyon
VIDEO: How old is the Grand Canyon? Will the Colorado River run dry? Learn about how the Big Ditch formed and the present state and uncertain future of the Colorado River watershed.



EVENT | HEALTH & DISEASE
Why sleep matters for personal and public health
VIDEO: Disrupted sleep ups the risks for heart disease, cancer and depression. How? And what can be done about the inequities that leave communities of color and poor people at greater risk?



EVENT | THE MIND
Bilingualism, the brain and society
VIDEO: Does speaking two languages enrich the brain? How do class and race influence the labeling of bilingualism as good or bad? Watch now to explore the neuroscience and social context of bilingualism.



EVENT | LIVING WORLD
The cultural lives of birds
VIDEO: Culture was once thought to be uniquely human, but scientists are finding evidence that many birds are also cultural creatures. What does avian culture look like? And why does it matter?


CONSPIRACY THEORIES: “Thank you *Knowable Magazine* editors for making this a free series, somewhat similar to TED only much more interactive and salient.”

SLEEP: “My first time here. I am really impressed with the quality of the speakers and the chat, and all the info you have provided. Thank you to everyone. I’ll be back.”

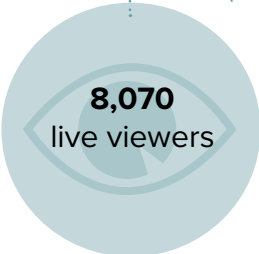
BIRD CULTURE: “This was better than reading a book on the topic. The speakers are highly qualified and express themselves clearly and to the point.”

BILINGUALISM: “I’ve learned a lot about the terminology that I’ve been using that promotes stigma that I will change! GRACIAS. MERCI. OBRIGADA.”


METRICS TO DATE
(all 18 events)




21,650
registrants



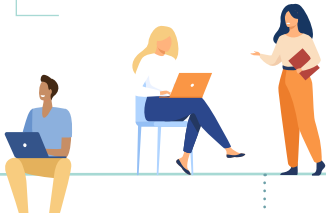
8,070
live viewers



24,900
replays



181 countries
(registrations)



Unlocking expert knowledge

Scientific research has a profound and growing influence on the lives of everyone on the planet, and on the future of the planet itself. Dialogue between science and society is therefore of vital importance and *Knowable Magazine* was established by Annual Reviews' some five years ago as a contribution to these conversations. It achieves this in part by unlocking the expert knowledge in the review articles that are published by the Annual Reviews journals.

Reviews provide a bird's-eye view of research. They synthesize hundreds of distinct findings in a coherent, compact and usable format that provides landscapes of science. They capture current understanding of a topic, set the work in historical context, highlight the major questions to be addressed and outline the practical applications and general significance of research.

Knowable articles have referenced more than 900 of these scholarly reviews. And, while the reviews have generally been sequestered behind a paywall, each of these 900 was opened to *Knowable* readers, resulting in 108,000 accesses. This is a significant step in unlocking scientific knowledge to assist policy, business and civil society.

In 2023, Annual Reviews intends to take a second big step by converting all 51 of its journals to open access. Thus, the 1,200 or so expert reviews published in 2023 will be openly available in perpetuity. In addition, the paywall on the previous nine years of content will be dismantled, providing access to a full decade's worth of content to everyone at no cost.

The conversion to open access will be achieved using a newly developed, equitable business model called *Subscribe to Open*. ([Learn more about *Subscribe to Open*](#))

A third step in unlocking expert knowledge is Annual Reviews' Wikipedia initiative. Wikipedia is a key source of scientific information for millions of people around the world, and, thanks to support from the Gordon and Betty Moore Foundation, Annual Reviews has retained a Wikipedian in Residence whose goal is to integrate high-quality secondary sources in the life, biomedical, physical and social sciences into Wikipedia articles.

Annual Reviews has been an integral component of the research landscape for more than 90 years, helping to synthesize and integrate knowledge and point to the road ahead. These three initiatives — *Knowable Magazine*, *Subscribe to Open* and the Wikipedia program — combine to maximize the value of the reviews to research and to extend that value to the wider community.

ANNUAL REVIEWS STATS AND FACTS

1931: Founded at Stanford University

2022: Annual Reviews published:

51 journals

1,208 articles

4,581 figures

3,718 authors invited
from **68 countries**



• **14 journals are ranked #1**

• **8 journals are ranked #2**

• **7 journals are ranked #3**

Source: 2022 edition of the Journal Citation Reports® (JCR) published by Clarivate

Testimonials

“In searching for a better understanding of how the brain changes, I came across your 8/18/2020 interview with neuroscientist Kimberley McAllister online in *Knowable Magazine*. And I was stuck by the wonderful clarity of the piece, as you stepped me through the general to the particular, supplying invaluable illustrations and captions along the way. Writers like you who really know their science, and can invite us non-scientists to the dance, deserve whatever rose petals we can throw in your path to demonstrate our appreciation of your knowledge and skills.”

—Roger Moore, reader

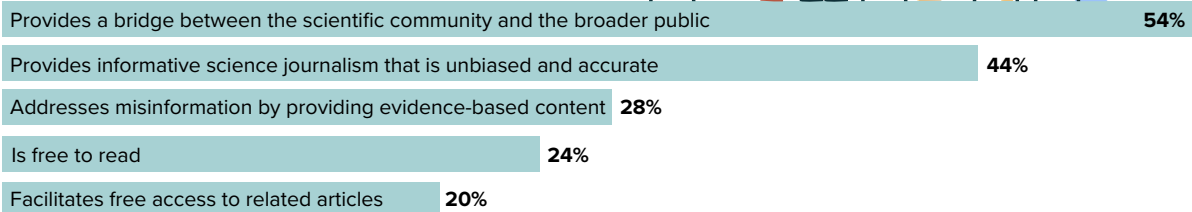
“*Knowable* is the ideal forum for bringing theory into practice, based on the best and brightest luminaries across more than 50 fields of knowledge.” —Andrew Lo, Charles E. and Susan T. Harris Professor, Sloan School of Management, Massachusetts Institute of Technology and member of the Annual Review Board of Directors

“Ensuring that scientific content is up to date is a major challenge on Wikipedia. Editors may tend to assume that an article is correct, especially if it is long or complicated. Updating of recent research and events depends heavily on the availability of secondary sources such as *Knowable Magazine* and Annual Reviews that communicate the importance of new and changing science.”

—Mary Mark Ockerbloom, Wikipedian in Residence, Annual Reviews

From our 2021 Community Interest Survey:

Knowable Magazine’s mission to “make scientific knowledge accessible to all” is important to me because it means that *Knowable Magazine*:



*Respondents could choose up to two

Total respondents: 924



Stay in the know

Sign up for *Knowable Magazine's* award-winning newsletter and be notified of *Knowable's* latest stories, upcoming online events and more.

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Deepen your support

Knowable Magazine and Annual Reviews have multiple opportunities for donors interested in deepening their support for science journalism and scientific understanding. For more information, please contact Kara Mitzel, director of development, at kmitzel@annualreviews.org.

Knowable Magazine from Annual Reviews is an editorially independent journalistic endeavor that seeks to make scientific knowledge accessible to all.

Annual Reviews is a nonprofit publisher dedicated to synthesizing and integrating knowledge for the progress of science and the benefit of society.

