of tenure."

Despite ongoing challenges, the community of researchers trying to assess the impacts of social media on society has continued to grow, says Rebekah Tromble, a political-communication researcher at George Washington University in Washington DC.

And behind the scenes, researchers are exploring different ways of working, says Starbird, such as developing methods to analyse videos shared online and to work around difficulties in accessing data. "We have to learn how to get insights from more limited sets of data," she says. "And that offers the opportunity for creativity."

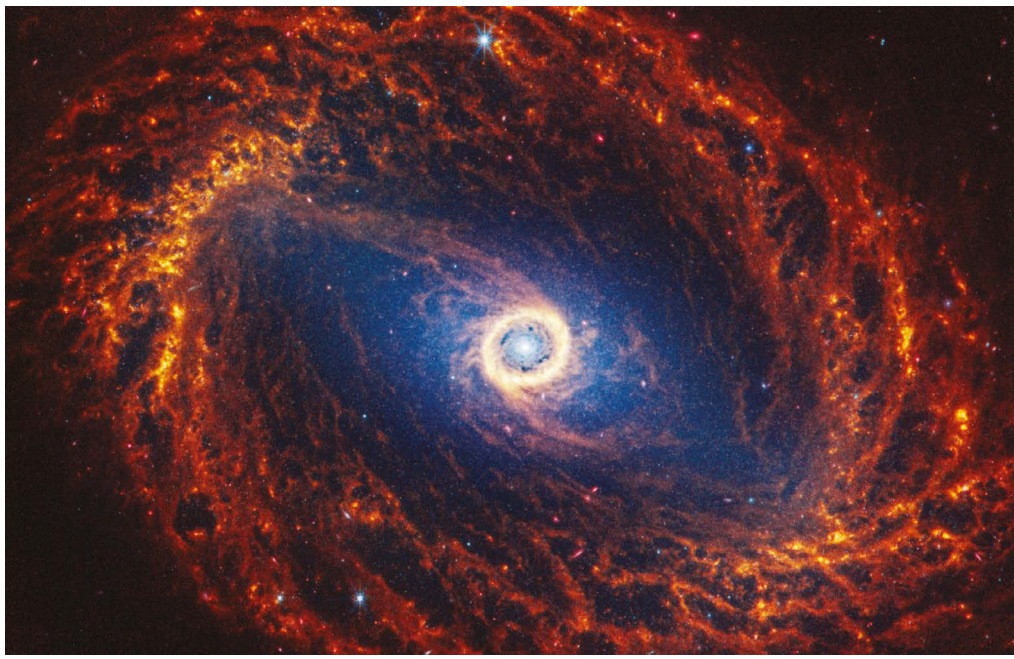
Donated data

Some researchers are using qualitative methods such as conducting targeted interviews to study the effects of social media on political behaviour, says Kreiss. Others are asking social-media users to voluntarily donate their data, sometimes using browser extensions. Tucker has conducted experiments in which he pays volunteers a small fee to agree to stop using a particular social-media platform for a period, then uses surveys to determine how that affected their exposure to misinformation and the ability to tell truth from fiction.

Tucker has conducted such experiments in Bosnia, Cyprus and Brazil, and plans to extend them to South Africa, India and Mexico, all of which will hold elections this year. Most research on social media's political influence has been done in the United States, and research in one country doesn't necessarily apply to another, says Philip Howard, a social scientist and head of the International Panel on the Information Environment, a non-profit organization based in Zurich, Switzerland, with researchers from 55 countries. "We know much more about the effects of social media on US voters than elsewhere," he says.

That bias can distort the view of what's happening in different regions, says Ross Tapsell, who studies digital technologies with a focus on Southeast Asia at Australian National University in Canberra. For example, researchers and funders in the West often focus on foreign influence on social media in southeast Asia. But Tapsell says that researchers in southeast Asia are more concerned about local sources of misinformation, such as those that are amplified by buzzers. The buzzers of Indonesia have counterparts in the Philippines, where they are called trolls, and Malaysia, where they are called cybertroopers.

In the absence of relevant and comprehensive data about the influence and sources of misinformation during elections, conflicting narratives built on anecdotes can take centre stage, says Paul Resnick, a computational social scientist at the University of Michigan in Ann Arbor. "Anecdotes can be misleading," he says. "It's just going to be a fog."



JWST has captured images of spiral galaxies in unprecedented detail.

NASA, ESA, CSA, STScI, JANICE LEE (STScI), THOMAS WILLIAMS (OXFORD) & THE PHANGS TEAM

JWST IS THE MOST IN-DEMAND TELESCOPE EVER

Only one in nine research proposals is likely to be approved in latest application cycle.

By Rahul Rao

Astronomers from around the world met in early February to review the latest crop of research proposals for the James Webb Space Telescope (JWST). They sifted through 1,931 submissions — the most ever received for any telescope in history — and ranked them. By the time the reviewers begin releasing their decisions late this month, only one in every nine proposals will have been allotted time to collect data with JWST.

The huge demand is an indicator of the space observatory's immense success: it has wowed astronomers by spotting some of the earliest galaxies ever seen and has uncovered more black holes in the distant Universe than was predicted. Launched in December 2021, it is the hottest property in astronomy. But oversubscription leaves many sound research projects in limbo.

"The overwhelming majority of submitted JWST proposals are very good, totally worth doing, absolutely should be done if time allows," says Grant Tremblay, an astronomer at the Harvard–Smithsonian Center for Astrophysics in Cambridge, Massachusetts. "But most of them will be rejected."

Using JWST can take anywhere from a few minutes for a simple project to hundreds of hours for a major survey. When researchers apply for observing time, they are competing for limited slots — some of which are automatically earmarked for scientists who helped to develop the telescope, including those at the European Space Agency and the Canadian Space Agency.

This is JWST's third proposal submission-and-review cycle. During the first, the Space Telescope Science Institute (STScI) in Baltimore, Maryland, which operates JWST, received 1,084 submissions; reviewers gave the green light to one out of every five. During the second review cycle, submissions rose by about 35%, and the acceptance rate dropped to one in seven.

For the first cycle, applications were due before the telescope had even lifted off from Earth. Many astronomers were reluctant to put their energy into writing proposals for an instrument that might not succeed, says Christine Chen, leader of the group at the STScI that issues calls for proposals.

"As time has gone on, Webb has just performed so beautifully that people are having

an easier and easier time envisioning how it's going to advance their science," she says. "It's natural that the community is excited."

Still, demand for JWST is unprecedented. It has surpassed that for the 33-year-old Hubble Space Telescope, its predecessor flagship observatory. For most of Hubble's lifetime, reviewers have approved between one in four and one in six of the proposals submitted.

One reason for JWST's popularity is that it has capabilities that other telescopes don't. It is the most powerful infrared space telescope ever built, so it can observe objects in the very distant Universe and can scan the atmospheres of exoplanets for molecules that other instruments can't see. In fact, a proposal's specificity to JWST is one of the reviewers' criteria. If an experiment can be done with another telescope, it will almost certainly not receive JWST time, Chen says. "We want to execute projects that you can do no other way."

Pain points

A large portion of the JWST proposals that get rejected are resubmitted during the next review cycle. Reviewers encourage researchers to fine-tune their submissions — usually to clarify their scientific justification for a project — and try again. Tremblay, for example, had one proposal rejected during JWST's first cycle but accepted, with some edits, in the second.

"High oversubscription is horrible, but it does drive rigour in the preparation [of proposals] and ensure the science is strong," says Thomas Haworth, an astrophysicist at Queen Mary University of London. JWST cost a lot — more than US$10 billion to develop — so "we want to make sure it does the best science it can", he adds.

Would-be users are not the only ones feeling the pain of JWST's oversubscription rate. Tremblay says that the ballooning number of proposals is placing an increasing burden on those volunteering their time to be on review panels. "It's a lot of work. I don't think the process as it exists now can scale up much further," he adds.

This is not a JWST-specific problem. The holder of the previous record for most proposals — the Atacama Large Millimeter/submillimeter Array (ALMA) in northern Chile — received 1,838 submissions during a review cycle that began in 2018. By 2021, ALMA, an internationally funded radio observatory studying how stars and planets form, among other things, had mostly switched to a distributed peer-review system. In this approach, a researcher who submits a proposal is required to review a certain number of their peers' proposals in the same cycle. If they do not, their own proposals might face disqualification.

Whether or not JWST retains its current review system, astronomers' desire to use it is likely to remain high for years to come — at least until another instrument of the same calibre opens its aperture.

AI MODEL LEARNT LANGUAGE BY SEEING THE WORLD LIKE A BABY

A neural network taught itself to recognize objects using the filmed experiences of a single infant.

By Elizabeth Gibney

An artificial intelligence (AI) model has learnt to recognize words such as 'crib' and 'ball', by studying head-cam recordings of a tiny fraction of a single baby's life.

The results indicate that AI can help us to understand how humans learn, says Wai Keen Vong, a researcher in AI at New York University. This has previously been unclear, because other language-learning models such as ChatGPT learn from billions of data points, which is not comparable to the real-world experiences of an infant, says Vong. "We don't get given the Internet when we're born."

The authors hope that the research, reported in *Science* on 1 February, will feed into long-standing debates about how children learn language (W. K. Vong *et al. Science* **383**, 504–511; 2024). The AI learnt only by building associations between the images and words it saw together; it was not programmed with any other prior knowledge about language. That challenges some cognitive-science theories that, to attach meaning to words, babies need some innate knowledge about how language works, says Vong.

The study is "a fascinating approach" to understanding early language acquisition in children, says Heather Bortfeld, a cognitive scientist at the University of California, Merced.

Baby's-eye view

Vong and his colleagues used 61 hours of recordings from a camera worn by a baby boy named Sam, to gather experiences from the infant's perspective. Sam, who lives near Adelaide in Australia, wore the camera for around one hour twice a week, from the age of six months to around two years.

The researchers trained their neural network — an AI inspired by the structure of the brain — on frames from the video and words spoken to Sam, transcribed from the recording. The model was exposed to 250,000 words and corresponding images, captured during activities such as playing, reading and eating. The model used a technique called contrastive learning to learn which images and text tend to go together and which do not, to build up information that can be used to predict which images certain words, such as 'ball' and 'bowl', refer to.

To test the AI, the researchers asked the model to match a word with one of four candidate images, a test that is also used to evaluate

WAI KEEN VONG

Sam — here aged 18 months — wore a camera whose recordings trained an AI model.