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COMMUNICATION

Antisocial media

Twitter and other social media help researchers to connect and stay current — but they can also cause emotional distress. Here's how to mitigate that.

BY AMBER DANCE

Last August, astrophysicist Katie Mack posted a comment on Twitter saying that climate change scares and saddens her. Her tweet attracted the attention of another user, who posted in reply: “Maybe you should learn some actual SCIENCE then, and stop listening to the criminals pushing the #GlobalWarming SCAM!”

The comment struck Mack as amusing, so she tweeted back. “I dunno, man, I already went and got a PhD in astrophysics. Seems like

more than that would be overkill at this point.” Her tweet, which was shared thousands of times on the social-media platform, prompted the other user to suggest that she might ask for a refund on her doctoral programme. A brief exchange sparked between the two about the merits of Mack’s CV before Mack disengaged. She says that she feels bad that some of her followers continued to attack the other user.

Of the 3,500 researchers who took part in a 2014 *Nature* survey on the use of social media, 13% said they regularly use Twitter, and about 40% said they use Facebook and

LinkedIn. Of those on Twitter, half use it to follow topics relevant to their research, and 40% of those users participate in the discussions. Many scientists find important upsides to their participation in social media, from staying up to date on science news and connecting with other researchers to garnering invitations to collaborate, co-author papers or attend conferences. “It’s a really good place to get very immediate information about science,” says Mack, who adds that she loves the ability to connect with other researchers and engage with members of the public. ►

► Although many scientists say their social-media experience is generally pleasant and helpful, some platforms — particularly Twitter, Facebook and the online comment section of many publications — have a dark side, including exposing users to ‘trolling’. Trolls start arguments or post inflammatory messages, which can range from snide comments to death threats. Less-threatening hassles, such as arguments that can rapidly escalate, still take up time and energy if you choose to engage in them. To stay safe and sane online, experienced social-media users recommend setting goals for social-media use and sticking to them, never posting while angry and keeping positive thoughts — such as memories of professional accomplishments — at the ready if criticism pops up.

Users’ digital experience depends at least in part on their topic of discussion, noted the late Hans Rosling, a statistician and

founder of Gapminder, a foundation in Stockholm that provides information about global development. Speaking to *Nature* before his death in February, he said that he tweeted updates about global trends but kept his personal views to himself, adding that he had little trouble with trolls. For scientists who want to be active on social media, it is best to define and maintain a focus from the outset, he advised. “Be thoughtful, then stay consistent,” he said.

TROLL TALK

Critiques of researchers’ posts come from within the scientific community as well as from outside it, and scientists need to respond carefully to foster intelligent, polite discourse. But that doesn’t always work. Jonathan Eisen, an evolutionary biologist at the University of California, Davis, freely tweets about science topics, his own work and interesting papers or

presentations. He has got into arguments on Twitter in connection with some posts.

He once found himself embroiled in a nasty spat with supporters of a journal when he had retweeted a post that disagreed with one of its editorials. A Twitter user began to attack the critics, including Eisen, who blocked the user as the battle escalated. He received support from colleagues on the thread and in e-mails, but stayed off Twitter for a few weeks afterwards. Now, when things heat up online, he gets up and walks away.

The potential to attract troll-type comments also depends on the identity of the person writing the post, notes Björn Brembs, a neuroscientist at the University of Regensburg in Germany. “I’m in the one demographic that probably never has to suffer — I’m an old white dude,” says Brembs. But for many groups, including women, people of colour, people of certain religions and members of the LGBTQ community, the digital world can be a minefield. In April 2016, British newspaper *The Guardian* analysed the 70 million reader comments left on its website over a decade. Eight of its “10 most abused writers” were women; six were people of colour; and three were gay. The ten writers who received the least abuse were all men.

Controversial science can also draw haters. David Shiffman, a marine-conservation biologist who will start a postdoc in May at Simon Fraser University in Burnaby, Canada, has won awards for his online science communication. He says that he has received the most vicious comments in connection with his shark research, which used tissue samples to study the diet and habitat of threatened species. During his PhD, he and colleagues at the University of Miami in Florida made boat trips to collect blood and other samples from wild sharks. They took great care to minimize distress to the animals, but critics charged that the research was not only cruel but worthless.

Although some social-media users in the research community ignore trolls, Shiffman doesn’t agree — keeping quiet, he says, means that other users would never learn about the online abuse that women and other groups endure, and that incorrect scientific ideas would float unchallenged through the Twittersphere. He exposes trolling by retweeting the comment, explaining why the argument is wrong or inappropriate and offering to answer one legitimate question. His aim is not to persuade the troll, however. “My goal is to convince the other people that are watching.”

Mack is also careful with her replies to criticism, and doesn’t spend much time engaging with it. Her retort about her PhD training was an exception. “Sometimes you have to find stuff funny, because otherwise it’s too depressing,” she says.

If users find themselves under attack on Twitter, the company offers various solutions (see ‘Troll control’). But sometimes blocking or

TROLL CONTROL

Take the heat from the tweet

Annoying or abusive commentary may be an unavoidable presence online, but that doesn’t mean that you can’t do anything about it. Experienced Twitter users offer these tips.

● **Follow the ‘rule of three’.** If it takes more than three short comments to explain or solve an issue, the discussion doesn’t belong on Twitter, says Fabiana Kubke of the University of Auckland in New Zealand. It might be better to write a blog, and link to it.

● **Don’t make it personal.** “Criticize a paper but not the authors; criticize a conference, not the organizers,” says Jonathan Eisen of the University of California, Davis.

● **Respond once to critics or trolls,** to correct the record and let their followers see the truth, suggests David Shiffman, a social-media expert who will soon be starting a postdoc at Simon Fraser University in Burnaby, Canada.

● **Don’t tweet when angry or upset.** You might type something you regret.

● **Cool down.** Walk away from the digital world and take a break if things start to upset you.

● **Keep a record of threats.** You might need to share it with police in the future.

● **Call on allies.** Friends can help you to feel better when the Internet gets nasty, or they can monitor your account for threats when you don’t want to engage.

● **Keep your confidence up by recalling your accomplishments,** suggests Marcus du Sautoy of the University of Oxford, UK.

In addition, Twitter offers tools to block out or report offensive comments:

● **Hit ‘mute’.** Trolls can still follow you, and won’t know that they’ve been muted, but you won’t see their comments. Twitter has also added the ability to mute a word or phrase.

● **Block a Twitter user’s account.** This prevents them from following you. They won’t be able to see your tweets, and if they go to your Twitter profile, they’ll see a notification that they’ve been blocked.

● **Consider the ‘quality filter’.** This option is meant to remove tweets that seem to come from bots, or are duplicated comments. You can also set a filter so that you’re notified only about comments from users you already follow. In February, Twitter posted a blog introducing ‘safe search’ settings that will keep search results free of tweets that are identified as ‘potentially sensitive’ or that come from muted or blocked accounts. It also said it would add a feature that collapses ‘low-quality’ or ‘potentially abusive’ tweets, so users see them only if they want to (go.nature.com/2it8wtr).

● **Report abusers.** If you receive or observe attacks, you can report a comment to Twitter moderators. The company might suspend or lock the offending account or ban the user altogether. In November, Twitter announced on its blog that it was stepping up its efforts to combat abuse by expanding the mute function to cover phrases or conversations and allowing users to report when they see others being abused online (go.nature.com/2it4hxc). In its February post, Twitter also promised to do more to stop people whose accounts have been suspended from signing up again with a new identity. **A.D.**

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reporting the abuser isn't the only necessary action. Regular social-media users also have techniques to calm themselves down after being criticized. Shiffman will often step away from his digital device to play with his dog or chat with a friend. And social media can also help researchers to get in touch with like-minded colleagues and associates who can commiserate and offer support.

Mack says that she sometimes enlists friends to sift through the rubbish, so that she can avoid reading the most insulting comments while the friends can ensure that no danger lurks.

Some followers do make violent threats, say both Mack and Shiffman, although they deem most to be non-credible. Shiffman keeps a record of such posts in case he is attacked, so that he will have information to give to the police.

CRITICAL DECISIONS

Eisen says that sharing opinions, even negative ones, is what makes social media so valuable. But he adds that it's important to be careful about whom he debates with online, and how he frames his opinions. "Try your best to never make it personal," he counsels.

Social-media users also need to be careful about posts that could be taken out of context. That happened to Brembs when he posted a two-part tweet about another researcher's work, noting that he'd had similar ideas, and congratulating the other for succeeding where he'd given up.

A third person whom Brembs follows on Twitter picked up only the first half of the comment in his blog — making Brembs seem to be arrogantly claiming that he'd already had the great idea. In response, Brembs wrote one comment to that blog to clarify his position. Then he thrust it all from his mind.

Given Twitter's 140-character limit, it's especially easy for misunderstandings to boil up on that platform. Brembs once got into a heated Twitter argument about whether a person ought to submit chapters to a mentor's book project. His opponent blocked him. Later, he realized that he and the other person simply had different definitions of the word 'mentor'. "It would have cleared up if I'd just caught my cool," he says. "My advice is to never, ever tweet when agitated." But if you're reacting to a nasty post, or if argumentative posting is unavoidable, he suggests using humour, even with a self-deprecating tone, to ease tension.

Sometimes researchers must decide whether to engage at all. Fabiana Kubke, a neuroscientist at the University of Auckland in New Zealand, does her best to avoid Twitter discussions that she thinks might lead to misunderstandings. If the issue can't be resolved in three tweets or fewer, she won't respond on Twitter, or she'll post a response on her blog and include a link on Twitter.

The risk of being criticized or trolled means that social media isn't for everyone, users say. "If you're the sort of person who wonders if you suck when one random person tells you that you suck," says Shiffman, "while 1,000 of your respected peers tell you that you're

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great, you should not do this."

Of course, harsh critiques are hardly unique to Twitter. Marcus du Sautoy, a mathematician at the University of Oxford, UK, has been writing in newspapers and other publications about science for the public since 1994. "If you raise your head above the parapet, people are going to shoot," he warns. Some of his earliest critics were scientists who complained that he'd cut corners or simplified his explanations for lay readers.

He learned early on to avoid the comments section below his online articles because that forum often contains posts that aren't productive, and may be nasty: an attacker there once smeared him for marrying a Jewish woman and raising Jewish children.

"It's important to have the right mindset so that you don't get crushed by these things," he adds. When critics attack, he recommends that researchers remind themselves of what they've achieved in science. For example, he likes to console himself, he says, with the knowledge that he once discovered "a new symmetrical object in high-dimensional space that nobody had ever seen before". ■

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WORK-LIFE BALANCE

It's not all about the job

Career success does not lie in working longer hours, says Robert Lechler, president of the UK Academy of Medical Sciences, as part of a diversity initiative urging researchers to embrace outside interests. On 23 February, the academy launched the campaign, called #MedSciLife, to promote dynamic working practices. Lechler says in a special issue in *The Lancet* that time spent outside work nourishes creativity, builds resilience and offers fresh perspectives on problems (R. Lechler *Lancet* **389**, S1; 2017). These are "precisely the skills that result in the best-quality research," he writes. "A life outside science is not an extra." The campaign website offers personal stories and resources for medical researchers and those who are considering the field as a career (www.medscilife.org). "I find science pretty stressful," says Paul Martin, a cell biologist at the University of Bristol, UK, in a post on the site. "So I have several hobbies to 'escape' work." As part of the campaign, photographs of early-career medical-science researchers in their work and personal lives are exhibited at the academy's headquarters in London.

TRANSFERABLE SKILLS

STEM must branch out

US graduate programmes in science, technology, engineering and mathematics (STEM) are too focused on the development of academic-research skills and should be retooled to meet the needs of employers outside academia, a report finds. In *Professional Development: Shaping Effective Programs for STEM Graduate Students*, the Council of Graduate Schools (CGS) in Washington DC notes that non-academic STEM employers want candidates with transferable skills (see go.nature.com/2m3fkfa). Some of those include experience in data science and big data; science policy; governance, risk and compliance; and time, project and budget management. Just 10% of US graduate programmes actively teach these skills, the report finds. Graduate students often do not participate in professional-development programmes because they feel that faculty members do not value the non-academic career path, and because some federal funding structures do not incentivize broad professional preparation, the report says. The CGS offers an online database of university professional-development programmes that other institutions can use as a model.