Researchers can use websites such as Kaywa to generate QR barcodes to embed in their posters. Viewers can scan the barcodes with a smartphone or tablet to automatically open a web page showing videos, linked papers or further data.

Apps come in handy for hallway conversations, too. Ball uses Skitch and Paper to draw pictures with her finger or a stylus, illustrating concepts in her volcano research — the locations of hot springs, for example, or the direction of fluid movement in a lava dome. She can e-mail the pictures to others or save them as ideas for figures.

Carol Finn, president of the AGU, uses the Keynote app on her iPad to show slides from her presentation, and EarthObserver to demonstrate features of the area she is studying, such as topography. For Android users, Quickoffice Pro and Google Earth, respectively, perform some of the same functions.

In future, other conference interactions may also move into apps. The AGU is considering adding scoring forms for its student-paper competition — in which volunteer attendees judge students' presentations at poster sessions — to its app. It is also thinking about adding discussion boards on which people can ask presenters questions about uploaded posters or recorded talks. This year, Bizzabo will start offering polling so that registered users can vote on their favourite sessions.

Apps with indoor mapping might one day pinpoint attendees' location in the building and direct them to the next session on their itinerary. Organizers could make conferences into a game by giving people rewards for going to specific activities or booths.

Some meetings might soon drop paper programmes all together. The Association for the Sciences of Limnology and Oceanography in Waco, Texas, offered an app at its meeting for the first time in 2013, and will probably go paperless in a few years, says co-organizer Hans-Peter Grossart, a microbial ecologist at the Leibniz Institute of Freshwater Ecology and Inland Fisheries in Neuglobsow, Germany. However, the AGU and the AAAS plan to offer paper programmes for the foreseeable future.

Conference attendees do need to exercise caution when turning to the blizzard of digital tools. Taking photos of slides, or recording talks without the speaker's permission, is generally considered bad form. And users should try not to get distracted by the constant stream of tweets and notifications during real-life conversations. "You want to be present," says McTavish. Emma Borochoff, a community manager at Bizzabo, agrees. "Connections aren't complete if they're just online," she says. ■

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COLUMN

Roadside science

Sometimes the best outreach happens when lay people stumble over research unawares, says **Carolyn Beans**.

As government funding of science declines and public scepticism runs rampant, scientists are working hard to find effective ways to explain their research to others. Although social media, magazines, museums and nature centres are all important vehicles for bringing science to the public, I worry that they draw only people who already appreciate research. How can we reach those who are resistant or indifferent?

With this concern in mind, I take my job as a roadside scientist very seriously.

I study an invasive plant in the northeastern United States, and find myself working along roadways that encourage its spread. I wear red rain boots, a reflective vest, a waist pouch that I have fashioned into a tool belt, and a baseball cap draped with mosquito netting. I look ... well, odd. Cyclists, pedestrians and drivers often stop to ask what on Earth I am doing.

In Lubeck, Maine, an electrician parked and came over to check out my work. I pointed to the seedlings of the native and invasive jewelweeds that I study, then showed him the seedling that I was folding into my plant press. The leaves of my sample were coloured like those of the native jewelweed, but shaped more like those of the invasive species, suggesting that the sample was a hybrid. It made me wonder whether the invasive jewelweed might invade not only the native's space, but also its genome. The electrician marvelled that this was what science looked like — a woman on the side of the road folding plants in newspaper.

In Camden, Maine, a neighbour asked about the mesh bags that I was placing over developing fruits of the native jewelweed. I explained that I needed seeds from the native

species living in places both with and without the invasive plant. I could grow these seeds in competition with the invasive species in a greenhouse, to test whether the native seedlings from invaded communities survived better than those from communities without the invaders. The neighbour was excited to learn that evolution could take place on his own street, and that it was actually measurable.

Sometimes I am tempted to brush off a curious passerby. As the field season wanes, any distraction feels as if it could result in enough data loss to ruin an experiment. But I have gained meaningful insights from my interactions with the public. An older woman in Camden who showed me the local children's library told me that she recalled seeing the magenta flowers of the invasive jewelweed in her neighbourhood as many as 50 years earlier. This suggested to me that the native jewelweed has had at least half a century to evolve in response to the invasion. In return, I told the woman that the plant she admired from her bedroom window was originally from India.

Not everyone who stops to ask what I am doing hangs around long enough to hear my response. Some are turned off by the mention of science. Others are too busy to chat. But if I explain my research clearly enough, many passersby want to hear more.

As a roadside scientist, I have the opportunity to talk to members of the public without first drawing them to a blog or museum. People who would never seek out a scientific discussion come to me unaware that we are about to talk about invasive species, evolution and what it is like to be a field biologist. I receive them not knowing whether they accept evolution, or if science is going to be a tough sell. I offer them an explanation of my work and they offer me the chance to win them over.

Just as successful political campaigns recognize that knocking on doors brings people to the polls, I believe that impromptu face-to-face communication brings people to an appreciation of science. In a way, we all become roadside scientists every time we describe our research to a stranger at a bar or to our aunt at a family party. I am just fortunate to have the chance not only to talk about science, but also to show people how it works on the streets where they live. ■

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