

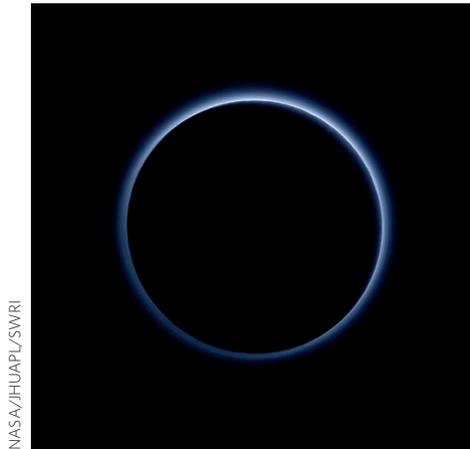
Sky's the limit

Scientists are beyond concerned. We are angry about the cuts to fundamental research and the decline in scientific literacy among politicians. But protesting isn't everything — we also need to adapt to change and engage with the public.

Why is it acceptable — encouraged, even, in some circles — to preface sentences with “I am not a scientist...” or “I hated maths/physics at school...”? Such statements should not be worn as badges of honour. Worse still, judging from the Brexit referendum and Trump election campaigns, many politicians don't seem to respect or even need ‘experts’. And these respective governments are cutting funding for basic research. As if the technologies that underpin our modern world can occur without fundamental advances. As if Tim Berners-Lee set out to connect the world, or J. J. Thomson to invent television. Giant magnetoresistance lies behind hard drives and sensors, as well as the compass function in smartphones. In addition, the ubiquitous selfie would not exist without CCD cameras developed by astronomers to capture photons from distant sources. Enough said, you might think.

Yet, it is difficult to imagine a current Western administration funding a new project now to measure gravitational waves in twenty years. But this very field of research has exploded since the first detections nearly two years ago (see the Perspective by Vicky Kalogera; article no. 0112). The ‘usefulness of useless knowledge’ concept, introduced by Abraham Flexner in 1939, has come to represent the quest to explore for the sake of exploration. Robbert Dijkgraaf writes a companion essay to stress the continued importance of curiosity-driven research in the face of funding squeezes (see our book review by Sibylle Anderl; article no. 0119).

Scientists need to continue to do science, but we could all work on winning back trust from a society that thinks it knows better because it knows how to Google. Our book review by Rachael Beaton on *Not a Scientist*, written by Dave Levitan, looks into how science gets mangled by politicians and what scientists should do to help communicate research results (article no. 0124). Otherwise, consider the wide-reaching repercussions following the discredited work by Andrew Wakefield on the



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combined MMR jab. There's little wonder why the public are confused about which advances to believe, especially when politicians are happy to trumpet grand (false) statements that an uncritical audience accept without question. How something is presented (confidently, with arrogance) starts to outweigh what is actually being announced.

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It's our job as scientists to explain our work to the public, without oversimplifying, and to educate politicians in order to influence policy. And a good place to start is by joining in one of the March for Science events happening around the globe on Earth Day, 22 April. As *Nature Astronomy* goes to press, hundreds of satellite marches are being arranged for scientists and concerned citizens to stand “together to acknowledge and voice the critical role that science plays in each of our lives” (<http://www.marchforscience.com/satellite-marches>).

The upcoming solar eclipse is another opportunity to engage non-scientists. Astronomers are working very hard on a coordinated outreach effort for what may be the event of a lifetime for many.

But it isn't all doom and gloom for science funding (unless you are doing climate science). There is some positive news for those working on defence or planetary science in the USA. And here is where scientists have to adapt. Take the Arecibo Observatory, for instance. Its revamped radar system has implications for military surveillance, so it makes sense for such telescopes to expand into defence applications and tap into the increased defence budget. Another example is NEOWISE, formerly WISE (Wide-field Infrared Survey Explorer), an infrared telescope that has been repurposed to protect our planet from near-Earth objects (see this month's Mission Control by Amy Mainzer, article no. 0127).

And refocusing NASA for space exploration has its benefits too, as current planetary missions are nearing or past their sell-by dates. In particular, the Cassini–Huygens mission has provided so much information on Saturn and its moons. In this issue we have two Titan papers: one on the centimetre-scale bubbles from Titan's seas (by Daniel Cordier and co-workers; article no. 0102), and the other on the seemingly paradoxical brightness of Titan being greater at twilight than during the day (by Antonio García Muñoz, Panayotis Lavvas and Robert West; article no. 0114). When Cassini crashes into the giant planet in September this year for its grand finale, there will be a gap until the launch of the ExoMars rover and Europa missions. A renewed planetary exploration programme at NASA would, therefore, be welcome. Moreover, exploring space is true to curiosity-driven research, although it would be ironic if NASA were to monitor climate on another planet (pictured, the blue sky of Pluto; see article no. 0125 for more on the ‘haze’ surrounding the dwarf planet) more closely than our own. □