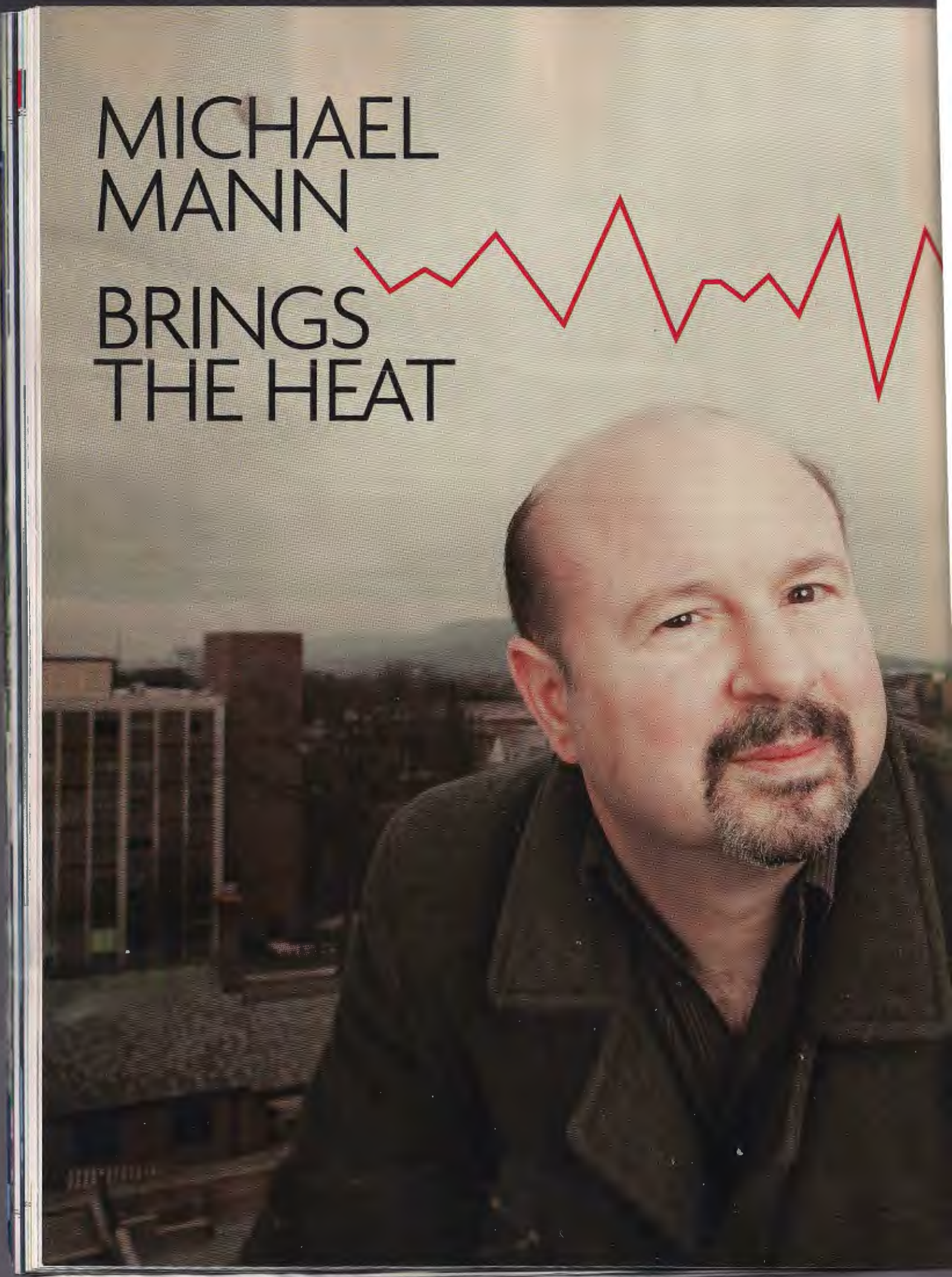
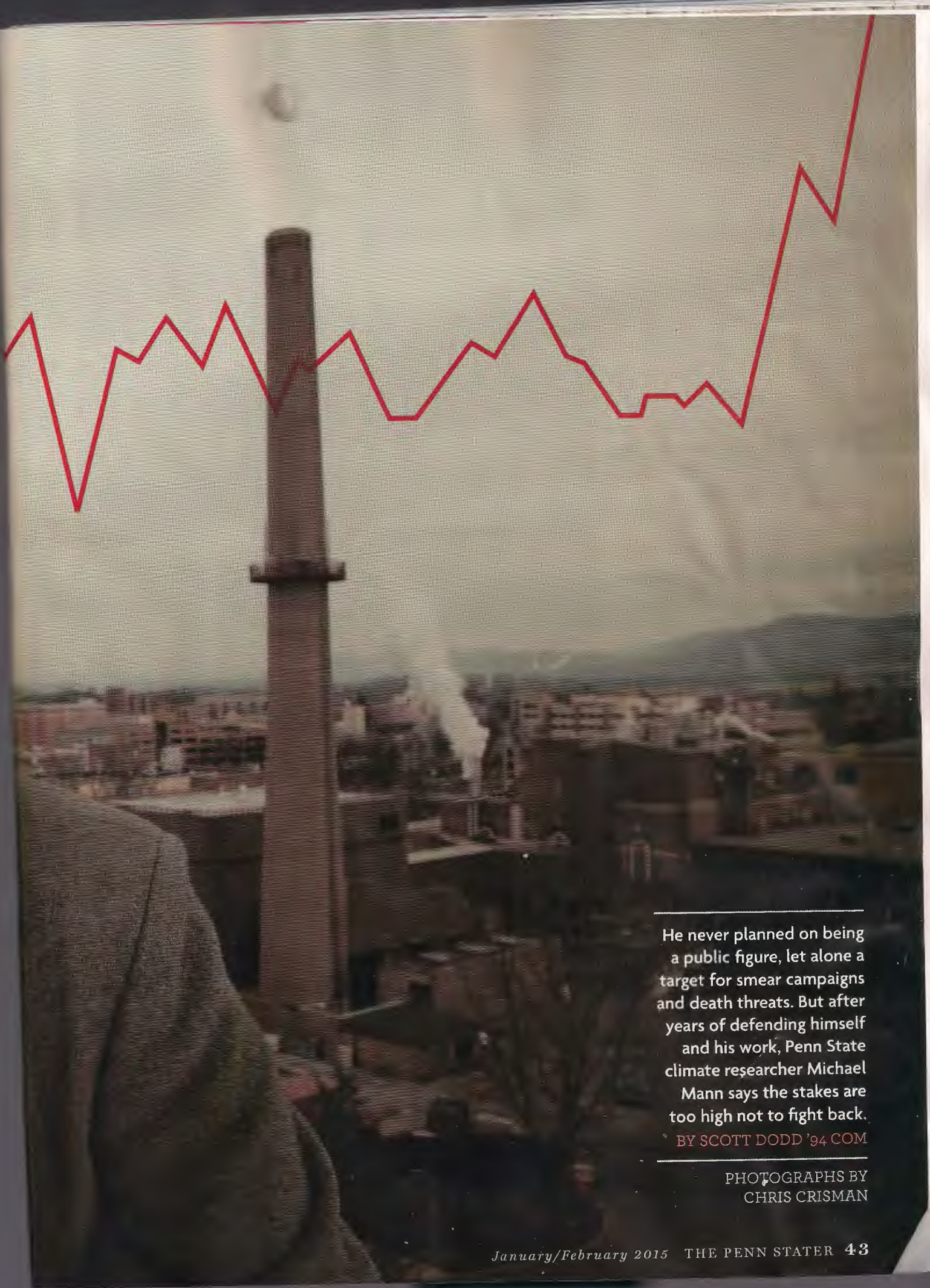
MICHAEL MANN BRINGS THE HEAT

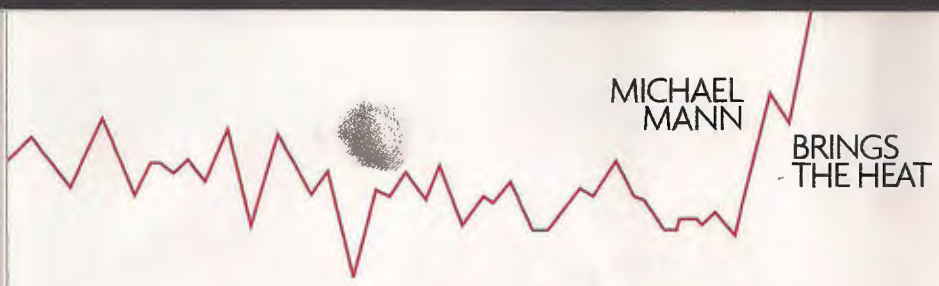




He never planned on being a public figure, let alone a target for smear campaigns and death threats. But after years of defending himself and his work, Penn State climate researcher Michael Mann says the stakes are too high not to fight back.

BY SCOTT DODD '94 COM

PHOTOGRAPHS BY CHRIS CRISMAN



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THE NIGHT BEFORE HIS FINAL LECTURE

of the semester last spring, Michael Mann drove home from New York City in a blinding downpour. As his car sluiced through a foot of water on the Cross Bronx Expressway, record-setting rainfall totals were being reported up and down the East Coast. (An average April's worth of rain fell on New York in a single day.) No single weather event can be blamed on global warming, but the deluge perfectly fit the sort of extreme storm that climate scientists like Mann predict will become more common in a warming world.

Mann, a distinguished professor of meteorology and director of Penn State's Earth System Science Center, had just given a speech at Fordham University on the underlying physics of climate change. His harrowing trip back to State College gave him an ideal real-world example to work into his final lecture, which focused on how rising levels of carbon dioxide in the earth's atmosphere are driving changes in agriculture, ocean currents, and weather patterns across the globe.

"Suddenly, over the past 24 hours, people have been talking about this again," Mann told his students. The unusually heavy spring flooding was triggered by very warm air from the Gulf of Mexico encountering cold air drawn from the Arctic—a mixture that many climate models predict will become more common, resulting in similar downpours. "A warmer atmosphere holds more moisture," Mann explained, as several of his students, heads down, typed away on their laptops.

Described by some as the most hated climate scientist in America, Mann was already the subject of controversy when he arrived at Penn State in 2005, hired by Eric Barron, then-dean of the College of Earth and Mineral Sciences and, since last May, the university's president. Mann had played a prominent role in drafting the third scientific report of the UN Intergovernmental Panel on Climate Change; that 2001 report prominently featured his now-famous "hockey stick" graph. (Mann is among the scientists whose work for the IPCC earned the group a share of the 2007 Nobel Peace Prize.)

First published in a peer-reviewed science journal in 1999, the graph used data from tree rings, ice cores, coral growth, and other natural phenomena to construct a rough global temperature record for the last 1,000 years. The first nine centuries' worth of data show a relatively flat line, before temperatures begin to shoot up in the 20th century, when fossil fuel use intensified. The flat line resembles the handle of a hockey stick, while the rapid increase is its blade. Hence the name.

The hockey stick was a relatively minor part of Mann's overall research, but it provided a simple, easy-to-understand picture of rising global temperatures. Not long after the graph's publication, Mann found himself targeted by conservative politicians, bloggers, and radio talk show hosts who sought to discredit the work of top climate scientists.

In 2005, just as Mann was set to leave the University of Virginia for Penn State, Congressman Joe Barton of Texas launched an investigation into his work, demanding that Mann and his colleagues turn over documentation and defend their research. Even some of Barton's Republican colleagues, including Senator John McCain, accused him of going too far, seeking to "intimidate scientists rather than to learn from them," in the words of then-House Science Committee Chairman Sherwood Boehlert (R-N.Y.).

Instead, the attacks only intensified. And Mann, increasingly, has fought back—on blogs, on television, even on the campaign trail, stumping against some of the politicians who most directly targeted him. Some of Mann's students follow him on Twitter (where he has 23,000 followers) or have seen him on cable news shows, where he aggressively engages with critics. So they're aware that there's more to him than the average professor. When he's in the classroom, Mann tries to focus on science and avoid the politics. But it isn't easy when the fundamental ideas behind his research—and his own credibility—are under constant attack.

"Simply saying what the facts are makes you an advocate in some circles," he says. "We've reached the point that you've got to stand up and be counted."

And there's no question which side Michael Mann is on.

BY NOW, SOME READERS will have discounted this article, and perhaps Michael Mann's entire career. For those not persuaded by the bulk of scientific evidence, there's hardly anything Mann or his colleagues can do to convince them. Climate change has become one of those scientific controversies—like evolution vs. creationism, or whether vaccines cause autism—that have passed into the cauldron of culture and politics. In this territory, ideology can matter more than data.

Still, it's worth noting the dozens of scientific organizations—among them the American Chemical Society, the National Academy of Science, the American Meteorological Society, and the American Association for the Advancement of Science—that support the conclusion that human activity is warming the planet.

SCIENCE VS. IDEOLOGY
Mann says he has "spent more than a decade fighting for an informed debate."

The latest data and observations from NASA, the National Climatic Data Center, and other federal agencies continually show that the earth's atmosphere and oceans are warming. According to the National Oceanic and Atmospheric Administration, the 12-month period ending in September 2014 was the warmest October-to-September period on record.

Even the military is convinced: In October, the Pentagon released a report stating definitively that it considers climate change an immediate national security threat, and that it is preparing for a future in which global instability and conflict will increase as a result of food shortages, intense drought, and refugees whose countries have been hit by drought or sea-level rise.

Mann's own research and conclusions have been validated by several independent reviews and replicated by scientists in dozens of peer-reviewed papers, with none invalidating his basic conclusions regarding the earth's long-term temperature record.

Despite all that, the very fact of climate change remains politically contentious—a concept that never occurred to a young Michael Mann when he first started down the path to a career in science. The son of a math professor at the University of Massachusetts-Amherst, Mann grew up solving puzzles—writing computer programs with his high school buddies and teaching a computer to play tic-tac-toe like in the movie *War Games*. Looking to escape the Northeast winters, he enrolled at the University of California, Berkeley in 1984. His early research was on the behavior of liquid crystals, like the ones found in high-definition computer and television screens. He pursued a Ph.D. at Yale planning to

EXPERTS FAR AND WIDE

Michael Mann is one of the best-known climate scientists on the planet, but at Penn State, he's just one of dozens of researchers analyzing every conceivable facet of global climate change. That research stretches across a half dozen colleges and a number of labs and institutes. Here, meet six of the most prominent Penn State faculty working to better understand the challenges, and find potential solutions. *—RJ*

RICHARD ALLEY

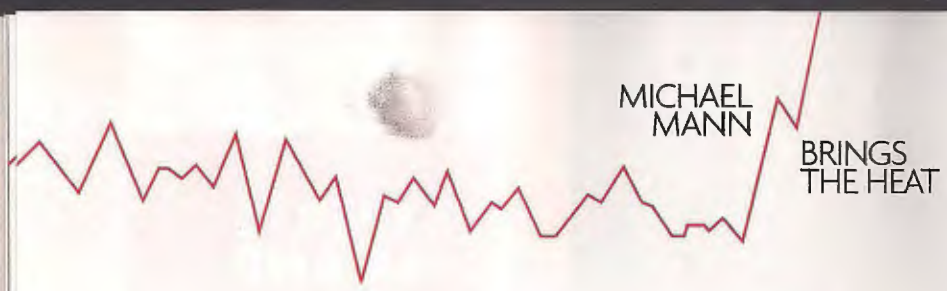
A glaciologist whose research on polar ice and sea-level rise have been hugely influential in understanding past warming trends. The host of the 2011 PBS documentary "Earth: The Operator's Manual" and a beloved instructor (search his song parodies on YouTube), Alley contributed to the IPCC report that earned the 2007 Nobel Prize.

BILL EASTERLING

A Penn State faculty member since 1997, Easterling was named dean of the College of Earth and Mineral Sciences in 2007. Prior to that, he led the Penn State Institutes of Energy and the Environment. Like Alley and Mann, he was an author on the IPCC report.

CHRIS FOREST

An associate professor of climate dynamics, Forest was a lead author on the Climate Change Science Program, which integrated the research



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stick with theoretical physics, until he came across a professor named Barry Saltzman, who was using physics to simulate the earth's climate.

"That sounded like a big-picture problem to me," Mann has written, "and an important one."

He joined Saltzman's lab and soon found himself working on ways to simulate the earth's past climate with state-of-the-art computer models. This was in the 1990s, when the field of climate science was just coming of age, as evidence mounted that humans were warming the planet. Mann's early work actually focused on the importance of natural variability in climate change. And certainly, before humans were around to burn fossil fuels, nature was indeed driving climate shifts—sometimes, as in the case of ice ages or major volcanoes, quite profound ones that led to large-scale extinctions.

Like Saltzman, Mann was initially skeptical that scientists could detect human influence at work in the current climate. But that changed as Mann and his fellow researchers began gathering data from a wealth of sources, including tree-ring growth rates and oxygen isotopes from glaciers and coral reefs. When they put those records together, the results showed something unusual: Global temperatures had jumped dramatically in the 20th century, an increase that coincided with the rise of industrialization—and with the resultant increase in carbon-dioxide emissions.

Saying so made Mann a target. He felt he had no choice but to aggressively defend his work. "It isn't what I signed up for," he says. "What I like most is being a science nerd."

"We all face this difficulty at some level," says his Penn State colleague, Richard Alley, Evan Pugh Professor of Geoscience and himself a prominent climate scientist (see sidebar). "If you become a scientist, you do not give up being a person. There's not a path through this where you're not going to get beaten up by someone."

Mann's toughest challenge came in November 2009, just as critical international climate negotiations were set to open in Denmark. Someone hacked into private email exchanges between Mann and scientists with the University of East Anglia's Climate Research Unit in the United Kingdom. Select phrases from those emails were released—notably "trick" and "hide the decline"—making it sound as if the scientists had falsified their findings.

Neither of those phrases were written by Mann, but they referred to his work on past temperature records. A full reading of the emails showed that neither phrase indicated subterfuge—indeed, they were about full disclosure—but the media ran with the faux scandal, quickly dubbed "Climategate."

It couldn't have come at a worse time, just as international negotiators were set to tackle a new climate treaty. The hackers had scored a victory, sowing further public confusion and discord over the science in order to thwart political action. In the months that followed, as many as eight major investigations, including by the British government, the National Science Foundation, the Associated Press, and Penn State itself, exonerated Mann and his colleagues of any scientific wrongdoing. But the damage had been done. "It was meant to humiliate me," Mann says, "and to send a message to other scientists: 'If you stick your neck out, we will come after you, too.'"

He was already a target in the media, but the "Climategate" notoriety made Mann a target in real life, as well. A few months after the emails were released, he received a letter with white powder in it. The FBI sealed off his office, and the powder went to a federal lab. It turned out to be cornmeal, but the incident—as well thousands of abusive emails "Climategate" inspired, including a steady stream of death threats—convinced Mann to take steps to keep his wife and daughter safe. "I'm on a first-name basis now with the local FBI and police chief," he says.

The scrutiny drove Mann even further down the road to advocacy. His detractors weren't pulling any punches, and now, neither would he. He wrote a book, *The Hockey Stick and the Climate Wars* (Columbia University Press, 2012), that called out his opponents and their scientific inaccuracies. And he used the growing influence of social media to strike back in real time with a fierceness that sometimes unnerves his colleagues, many of whom still prefer a more conciliatory approach.

"He has adopted a public persona that he thinks works," says Gavin Schmidt, director of the NASA Goddard Institute for Space Studies, "and it's quite combative. He writes from the heart and turns things up to 11 every time. But it's not a true reflection of who he really is."

MUCH OF THE misunderstanding over the East Anglia correspondence that spawned "Climategate" stems from the scientific concept of "uncertainty." It's something that Mann and other climate scientists talk about all the time. They know there's a lot that they don't yet understand about how atmospheric changes will affect the planet.

"The public has a lot of problems with the notion of science being a work in progress, of models being imperfect but useful," NASA's Schmidt says. "There are people who use the uncertainty of science against it. But there are things we actually do know."

Mann tells his students something similar during his final lecture of the spring semester. "Yes, there's uncertainty in the science—a fair amount of it," he says. "But that uncertainty doesn't necessarily resolve itself in our favor. It could be *worse* than we think."

In 2012, for instance, satellite observations showed surface melting over the entire Greenland ice sheet due to warmer temperatures, something computer models didn't expect to happen until the middle of this century. So the models were wrong—but humanity didn't catch a break, because the ice

EXPERTS FAR AND WIDE

of various U.S. government agencies to inform federal policy on global warming. His research focuses on the uncertainty of climate projections.

KLAUS KELLER
An associate professor of geosciences, Keller is director of the Center for Climate Risk Management, which integrates many of the university's varied experts on the subject. He also heads the Sustainable Climate Risk Management network, a collaboration with researchers from Penn State, Cornell, Yale, Rutgers, and other institutions.

JAMES SHORTLE
A distinguished professor of agricultural and environmental economics, Shortle is director of the Environment and Natural Resources Institute in the College of Agricultural Sciences. The institute has produced in-depth studies on the projected economic impact of climate change in the commonwealth, particularly for the state's farmers.

DAVID TITLEY
The retired Navy rear admiral returned to his alma mater in 2013 to lead the Center for Solutions to Weather and Climate Risk. **Titley '80 EMS** has been active in explaining the national security view on climate change: that the effects of a more volatile climate tend to destabilize governments and lead to a more dangerous world.

melt contributes to sea-level rise, one of the most potentially catastrophic impacts of global warming.

Among Mann's research interests these days is whether climate change will lead to more El Niño-like or La Niña-like conditions. El Niño and La Niña are phenomena in the Pacific Ocean that can drive weather patterns across the globe. El Niños generally lead to warmer and more harmful weather. La Niña years tend to be gentler. Within the climate science field, Mann takes the maverick position of arguing that the increased La Niña scenario is more likely—a scenario that would mitigate some of the impacts of climate change, making it less damaging in certain parts of the world.

"My critics claim I'm an alarmist," Mann says. But in his own research, he has identified a potential calming factor for climate change—something he would be highly unlikely to do if, as detractors claim, all he cares about is scare tactics. "That's the irony," he says.

Still, Mann doesn't think we're likely to get off easy. Too many variables seem to be breaking against us. "There's only one Earth," he tells his students, "and right now we're engaged in an unprecedented experiment on it. If you slam on the brakes of a locomotive, it doesn't come to a stop immediately. The climate system is the same way."

IF MANN REGRETS the loss of his anonymity and his ability to do science without harsh scrutiny, he has long since come to terms with it. In Oct. 2013, he appeared in a video urging Virginians to vote against Republican gubernatorial candidate Ken Cuccinelli, who as state attorney general had accused Mann of fraudulent research while at UVA and waged a failed attempt to subpoena Mann's records. Cuccinelli lost the election.

Closer to his current home, when some of Mann's most persistent critics used the Jerry Sandusky scandal to attack him (a blogger for the Competitive Enterprise Institute called him "the Jerry Sandusky of climate science, except that instead of molesting children, he has molested and tortured data in the service of politicized science"), Mann responded with a defamation suit. The case is still working its way through the courts.

Mann admits that being thrust into the public spotlight hasn't come without some advantages. Bill Clinton, President Obama, and other prominent politicians have sought his counsel. His media presence and the website he co-founded with Schmidt and other climate scientists, realclimate.org, have given him an influence far beyond his scientific work.

"He has clearly used this to do things," Mann's colleague Alley says. "There are people who would have been broken by all of the attacks, and he did not allow that to happen to him."

Still, Mann tries to draw a line and speak publicly only about the subjects he knows best. He has turned down invitations to speak out against natural gas fracking, for instance, because he doesn't feel qualified to express his opinion. On climate science, though, he is no longer shy.

Most days, though, Mann doesn't feel under attack. He says he's more likely to run into people at Starbucks (tall whipped mocha is his preferred drink) or the local supermarket who want to shake his hand and encourage him to keep going, rather than scold him for his ideas. "I feel like it's a gift," he says. "I do want to have influence over this discussion. I've spent more than a decade fighting for an informed debate. I've been put in a position to solve a new and difficult puzzle."

He's decided there's too much at stake for him to give up trying. ■

A former reporter at the *York Daily Record* and *Charlotte Observer*, **Scott Dodd '94 Com** is editorial director at the NRDC, where he oversees *OnEarth Magazine*. He is also an adjunct professor at Columbia Journalism School. He lives in New Jersey.