

two minutes



Bulletin of the Atomic Scientists

Annual Report 2017

The Mission

The *Bulletin of the Atomic Scientists* engages science leaders, policy makers, and the interested public on the topics of nuclear risk, climate change, and disruptive technologies.

We do this through our award-winning journal, iconic Doomsday Clock, public-access website, and regular set of convenings.

With smart, vigorous prose, multimedia presentations, and information graphics, the *Bulletin* puts issues and events into context and provides fact-based debates and assessments.

For more than 70 years, the *Bulletin* has bridged the technology divide between scientific research, foreign policy, and public engagement.

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Message from the Chair

Lee Francis

In 2017, as government agencies and officials used misinformation and reckless rhetoric to compound problems related to the potential use of nuclear weapons and the effects of climate change, the *Bulletin of the Atomic Scientists* redoubled its efforts to connect with more decision-makers and citizens around the world.

I am proud that the *Bulletin* increased its outreach programs as never before, even as I deplore the urgency and uneasiness that now permeate our national discussions. The scientists who created the *Bulletin* at the dawn of the Atomic Age, understanding the risks of nuclear proliferation, would be gratified to know that their descendants carry on with such determination.

They would be equally thankful for you, the people and institutions who make that work possible with expertise, financial support, and partnerships. Even in the most trying days of 2017, the *Bulletin* has been buoyed by a growing readership and a spirit that reflects a keen awareness of the risks, and the steady resolve to reduce them.

The stakes are absolutely too high to do anything else.

You will see in the pages that follow that the *Bulletin* has continued to welcome a diverse group of individuals to its events, website, and journal—and to engage the rising generation as essential voices and allies. Artists and scientists, interns and diplomats, concerned citizens and military leaders, educators and journalists—they are all valuable members of the *Bulletin* community. Introducing Chicago multi-media artist Ellen Sandor as the *Bulletin's* 2017 Annual Dinner honoree, my Governing Board colleague Steve Fadem said it best:

“There is a saying that war is too important to leave to the Generals. In this vein, scientific advancement is too important to leave to the scientists, and political turmoil is too dangerous to leave to the politicians. We are all needed—the generals, the scientists, the politicians, the writers, the activists, business leaders, and the artists—to help manage the advancement of technology, to think through its ethical and political implications, and to demand wiser leadership to govern it.”

I have been honored to serve as a board member at the *Bulletin* for well over a decade, supporting its growth and emergence as a key player in the sober work of protecting this planet and all its inhabitants. My board and staff colleagues are hard-working individuals—unflinching from the challenges and opposition we face.

I thank every one of you for standing with the *Bulletin*, and ask you to bring others to our pages and events in the year ahead.



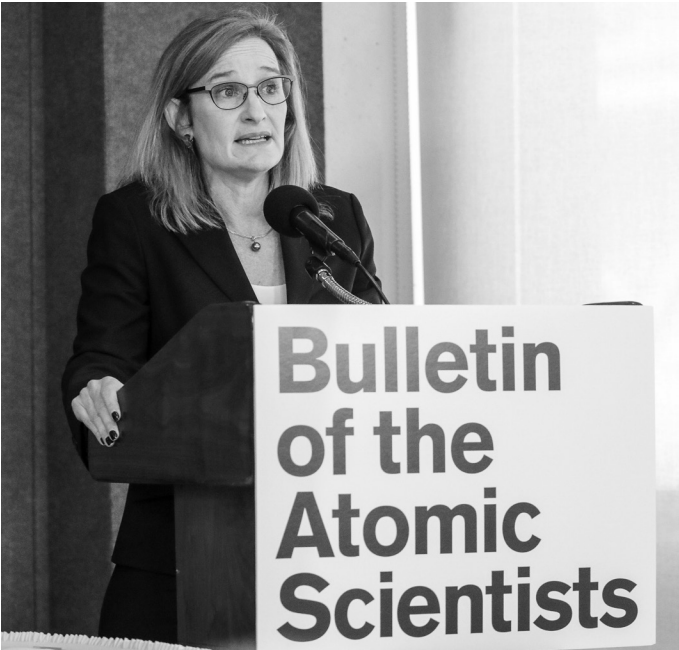
Lee Francis, MD, MPH



“Even in the most trying days of 2017, the *Bulletin* has been buoyed by a growing readership and a spirit that reflects a keen awareness of the risks and the steady resolve to reduce them.”

Message from the President and CEO

Rachel Bronson



“I am frequently reminded that the research we publish and the discussions we generate are not for the faint of heart. Nuclear proliferation, the effects of climate change, and the unnamed ethical challenges that we may face from disruptive technologies are serious, sobering, and real.”

I am frequently reminded that the research we publish and the discussions we generate are not for the faint of heart. Nuclear proliferation, the effects of climate change, and the unnamed ethical challenges that we may face from disruptive technologies are serious, sobering, and real.

And yet, I am grateful and encouraged by the heart and intelligence of the growing numbers of followers, readers, and supporters of the *Bulletin of the Atomic Scientists*. With your gifts and your engagement, you confirm that we’re up to the challenges we face, as urgent as they are. In extending my appreciation to all who stand with us, I assure you that we’re as determined as you are to tackle the tasks ahead.

In 2017, we vigorously stepped up our outreach efforts:

- We celebrated the opening of a major exhibit at the Museum of Science and Industry in Chicago that has welcomed thousands of visitors already.
- Our Doomsday Clock was part of another exhibit, “The Seeds of Time,” that opened at the Himalayas Museum in Shanghai, China.

- We regularly fielded media inquiries and responded to journalists and scholars around the world who read our public access website and subscribe to our e-newsletter and award-winning journal.
- We participated in the March for Science in our home base of Chicago and supported our colleagues in Washington DC, London, and elsewhere.
- We deepened our partnerships with sites catering to a younger audience such as *TeenVogue* and *NowThis Media*, and published far-reaching essays in more traditional outlets like *Reuters*, *The New York Times*, and *Harper’s* magazine.
- We spoke as panelists and featured experts in more venues than ever before. We hosted small gatherings with students and supporters who are eager to learn more about our issues.
- We continued to widen our circle of stakeholders, drawing on artists, playwrights, and filmmakers to absorb their insights.
- We strengthened our bonds with the University of Chicago, where we are based, and where our founders began publishing the *Bulletin* in 1945.

- And we even took a few breaks, notably one to toast the introduction of Atomic Child, a custom botanic beer by Forbidden Root Brewery that honored the *Bulletin*.

Clearly we share a growing uneasiness that nuclear threats are reaching unprecedented levels—demonstrated most vividly when we moved the Doomsday Clock forward to 2 minutes to midnight in January 2018. This followed a year of research and postings in our journal and website, and intense discussions among the members of our Science and Security Board. The worldwide response after the Clock announcement was markedly solemn and reflective—even more so than in prior years.

Our determination to #rewindtheDoomsdayClock is not driven by panic. It is driven by the unshakeable certainty that we are at a world-saving moment, and that we all have essential roles to fulfill—as citizens, advocates, artists, journalists, scientists, and policymakers.

We cannot do what we do without you. Thank you for your ongoing commitment.

Rachel Bronson
Rachel Bronson, PhD

times like these call for meeting people where they are

Meeting people where they are

At the Museum of Science and Industry



Turn Back the Clock exhibit opens

In May of 2017, the Museum of Science and Industry in Chicago opened an exhibit about one of the most provocative symbols of the 20th century—the *Bulletin's* Doomsday Clock. The “Turn Back the Clock” exhibit illustrates why the Clock matters today as much as it ever has in its 70-year history.

Reflecting the urgency of two major challenges confronting our world—nuclear weapons and climate change—the Clock exhibit calls on scientists, policymakers, and citizens to take part in the debates about important science and technology issues that greatly affect our lives.

The exhibit employs personal stories, interactive media, and pop culture artifacts, and visitors are invited to vote on a series of questions about global risks.

Turn Back the Clock is scheduled to remain open through June of 2018.



Meeting people where they are

Answering questions about the future

Visitors to the Turn Back the Clock exhibit responded to questions posed by independent evaluators in early 2018. Below is a selection of responses from some of these interviews.

Q:

What do you think the Museum wants this exhibit to communicate to visitors?

Do you feel like this was an encouraging or discouraging message?

Did you see any specific examples of people working together to make the world safer in the exhibit?

Did you find out about anything new or think about anything new as a result of the exhibit?

Why do you think the Doomsday Clock was created?

A:

“Action is important. Communication action or citizen action is important.”

“Encouraging, because I think it brings to people’s attention what could possibly go on and how we have to make changes.”

“*The Bulletin of the Atomic Scientists*, the fact that they’re still involved with this.”

“It said that President Obama was getting 10,000 letters a day about climate change... That’s a lot of letters.”

“I think it was created to keep a sense of urgency in people.”

“I wish everyone in the world would read it. It’s so critical.”



“I learned just how close the development of nuclear reactors and sciences were to home, literally.”

Thanks to our Exhibition Sponsors

Holthues Trust
William and Eleanor Revelle
The Libra Foundation
N Square Collaborative
John D. and Catherine T. MacArthur Foundation

Meeting people where they are

At marches, in public discussions, and in Shanghai

At the March for Science on Earth Day, April 22, board members, staff, and supporters joined some 40,000 marchers in Chicago and hosted an information booth at the end of the event. In the UK, *The Guardian* published a video featuring Ray Pierrehumbert, member of the *Bulletin's* Science and Security board and Halley Professor of Physics at Oxford, describing the significance of the Doomsday Clock, the *Bulletin*, and why scientists would be participating in the March for Science.

In China, the Doomsday Clock appeared as part of the Seeds of Time exhibit at the Shanghai Project at the Museum of the Himalayas in Shanghai.

At The Chicago Council on Global Affairs, *Bulletin* President and CEO Rachel Bronson led a discussion with a high-ranking trio of experts addressing the topic of “A New Nuclear Arms Race?” At the Adlai Stevenson Center on Democracy in Mettawa, Illinois, Bronson spoke on how nuclear risks and climate change affect the future and international stability.

Editor-in-Chief John Mecklin stepped away from his routine of publishing breaking news stories to speak to a large gathering at the Sarasota Institute for Lifetime Learning.

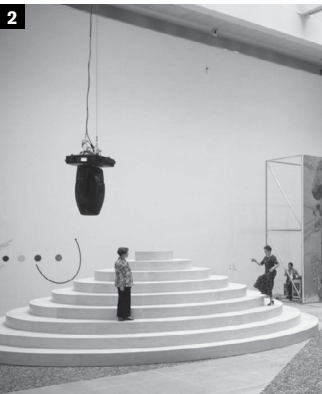
In Princeton and Washington, DC, Mecklin also led two communications workshops geared toward emerging leaders—part of a five-part series funded by the John D. and Catherine T. MacArthur Foundation.

1. Kendal Gladish, *Bulletin* consultant, Governing Board member Bill Revelle, and Grants Manager Lydia Veliko.

2. The Seeds of Time exhibit, Shanghai.

3. Ray Pierrehumbert, member of the *Bulletin's* Science and Security Board.

4. With Bronson are, from left: Robert L. Galluci, Distinguished Professor in the Practice of Diplomacy at Georgetown University; Scott Sagan, senior fellow at the Freeman Spogli Institute for International Studies at Stanford; and Ivo Daalder, Chicago Council president.



“True scientific facts need an advocate, and that’s the advocacy we’re taking on in the March for Science.”

Ray Pierrehumbert



“A magazine article aims to convey information that is important and interesting, in some combination. It’s almost an equation: Importance times interest value = how good the story is. Without something of interest, there is no story, no matter how important the information.”

John Mecklin



Meeting people where they are

Considering how to reduce global risks



Honoring our longstanding partnership with the University of Chicago, the *Bulletin* supported the University’s observance of the 75th anniversary of the first controlled and sustained chain reaction experiment, conducted by Enrico Fermi and his team. The series of anniversary activities, titled “Nuclear Reactions—1942: A Historic Breakthrough, an Uncertain Future,” opened with an October 1 panel discussion on the nuclear landscape led by Rachel Bronson. *Bulletin* intern Laura Brawley introduced a panel during the concluding sessions in December.

Governing Board member Sonny Garg and Julia Garg hosted a dinner featuring Board of Sponsors member Eric Horvitz, technical fellow and director of the Microsoft Research Labs. Horvitz led a provocative review of his research of human and machine learning.

At the University’s Institute of Politics, Bronson led a public conversation with Jeffrey Goldberg, editor-in-chief of *The Atlantic*, discussing American foreign policy during the Trump administration.

Sue Biniarz, one of the key architects of the Paris Climate Agreement, was the speaker at a *Bulletin* special dinner briefing on “Climate Change: Where Do We Go From Here?” Biniarz was at the University of Chicago’s Energy Policy Institute in winter quarter 2017 as a visiting distinguished fellow.

It was standing room only when the School of the Art Institute at Chicago (SAIC) and Illinois Humanities hosted a panel discussion including the *Bulletin* on the promises and perils of Artificial Intelligence.

Another large group gathered when the *Bulletin* presented a program on the Doomsday Clock to the Denver Council on Foreign Relations in the spring.

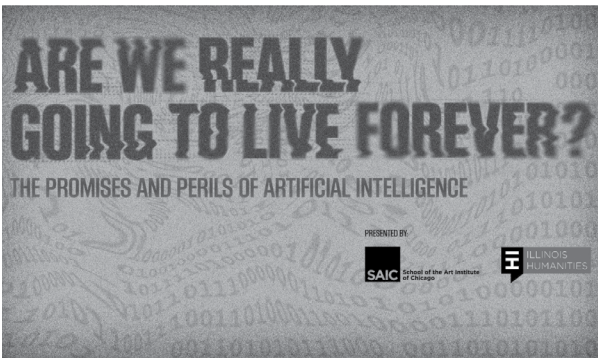
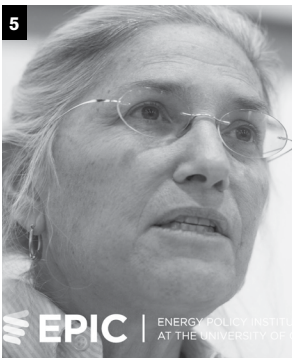
1. With Bronson at the chain reaction anniversary were, from left, former CIA director Michael Morell, former *Bulletin* board member and US Congressman Bill Foster, and Professor Robert Rosner, chair of the Science and Security Board.

2. *Bulletin* intern Laura Brawley.

3. Eric Horvitz, member of the Board of Sponsors.

4. *The Atlantic’s* Jeffrey Goldberg and *Bulletin* CEO Bronson at the Institute of Politics.

5. Sue Biniarz, EPIC fellow.



The event “drew one of our largest turnouts.”

DCFR executive director
Julia Patterson



Meeting people where they are

At the movies, watching TV, or over a new beer



“The Tribes of Men act like the Doomsday Clock has a snooze button.”

So sayeth Bruce Wayne in “The Justice League”

“Some mornings we struggle to just make coffee; meanwhile, the *Bulletin* is connecting scientific research, foreign policy, and public engagement. The Atomic Child release seems like the perfect opportunity to support the *Bulletin*’s work.”

Robert Finkel

JEOPARDY!

AFTER A FEW YEARS INACTIVE, THE “DOOMSDAY” ONE MOVED IN A PESSIMISTIC DIRECTION IN 2017

Somewhat lighter signs of the public impact and visibility of the *Bulletin* and the Doomsday Clock were also evident in 2017.

Bulletin leaders and supporters had a wonderful reason to gather at Chicago’s Forbidden Root Restaurant and Brewery in August for the release of the Atomic Child botanic beer.

The tasty adult beverage was created by the Forbidden Root team, led by restaurant founder and rootmaster Robert Finkel, a former member of the *Bulletin*’s Governing Board. Finkel used an eye-catching design for the can, produced by artist Tony Fitzpatrick. Forbidden Root donated a portion of the proceeds for every glass of beer sold or 4-pack purchased during the release.

Bruce “Batman” Wayne made a wise observation about the *Bulletin*’s Doomsday Clock in the fall 2017 release of the movie “The Justice League.”

The Clock popped up twice on the television game show JEOPARDY! in 2017, the first time on May 17 during Game 1 of the Teachers Tournament quarter-final. In the Category of “ALSO FOUND IN THE CLASSROOM,” contestants had to name an item that moved in a pessimistic direction in 2017. The show on August 28 was a re-run of the same episode.

- 1. Atomic Child botanical beer, created in honor of the *Bulletin*.
- 2. Rootmaster Robert Finkel with Artist Tony Fitzpatrick.
- 3. Celebrating the Atomic Child rollout were Claudia Tellez, Emma Belcher, Michelle Gittler, Lee Francis, and Theo Kalionzes.

Engaging the next generation

Attracting interns and younger audiences

2017–2018 *Bulletin* Interns

A select number of highly motivated students were again named as *Bulletin* interns in the past year. In a variety of positions working with *Bulletin* staff members, they gain essential experience in communications, data collection, editorial research, and fundraising.



- 1. Olivia Louthen
- 2. Kirk Lancaster
- 3. Louis Reitmann
- 4. Laura Brawley
- 5. Ethan Gelfer
- 6. Nick Reuter
- 7. Kiryl Puchyk
- 8. Matt Alexion
- 9. Delilah Marto

New features target next generation

TeenVogue is known as “the young person’s guide to saving the world,” and is now published in digital form. *Bulletin* authors began producing regular articles for the publication in 2017.

Emma Bastian
“US Weapons Testing Has Forced Marshallese People from Their Homes,” July 23, 2017

Yangyang Cheng
“I’m a Particle Physicist—Here’s Why the March for Science Matters to Me,” April 22, 2017

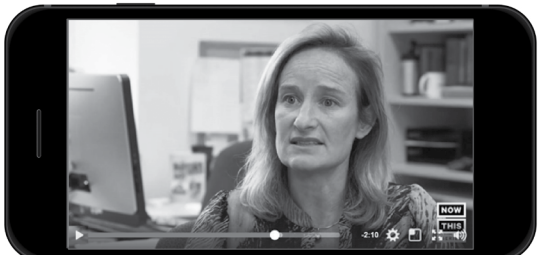
Rachel Bronson
“Why You Should Care about the Formation of the Nuclear Crisis Group,” May 9, 2017

Sharon Squassoni
“What You Should Know About North Korea and Their Nuclear Weapons Threats,” April 13, 2017

“How to Get Rid of Nuclear Weapons,” August 14, 2017

Now This is a website and media company which distributes video news content to mobile devices and social platforms. Several *Bulletin* experts appeared in 2017 Now This videos.

Science and Security Board members, including David Titley on climate change and Sharon Squassoni on nuclear security, along with Rachel Bronson, spoke in Now This videos.



Engaging the next generation

Selecting the Rieser Award winner



“I am the great-granddaughter of women with bound feet, for whom learning to read was a revolutionary act. I am a particle physicist at an Ivy League institution, working on the most powerful particle accelerator in the world. On April 22, I will be marching for science, for the promise of science as the great equalizer, for what it has been to me, and for what it can still be to many—to the privileged and the marginalized, to all. To paraphrase Langston Hughes, let science be science again, ‘let it be the dream it used to be.’”

Yangyang Cheng, from her Rieser Award-winning essay

2017 Voices of Tomorrow Authors

Adrian Alvarado
Kathleen Bachynski
Emma Bastian
Joel Beckner
John Brake
Sebastian Brixey-Williams
William Caplan
Yangyang Cheng
Paige Cone
Brenna Gautam
Robert Hart
Ian Johnson
Elsa Kania
Daniel Karr
Lami Kim
Jennifer Knox
Rafael Loss
Jessica Margolis
Ryan Musto
Ingrid Ockert
Saskia Popescu
Heng Qin
James Rogers
Nadezhda Smakhtina
Saurabh Todi
Kenneth Turner
Anna Wagner

The *Bulletin* named Yangyang Cheng its 2017 Leonard M. Rieser Award recipient for her April 22 essay “Let Science be Science Again.”

The Rieser Award was established in 2015 to recognize outstanding emerging science and security experts who are passionate about connecting scientific research to policy outcomes. The winner of the award is selected by the *Bulletin*’s editorial team from among our Voices of Tomorrow essayists--new authors and rising experts who write with distinction about at least one of the *Bulletin*’s core issues: nuclear risks, climate change, and disruptive technologies.

In her award-winning piece, Cheng advocates for scientists to engage in the political process and defend the advancement of science.

In selecting Cheng’s submission Editor-in-Chief John Mecklin said, “Yangyang Cheng has such a wide-ranging intellect and inexhaustible reservoirs of energy that sometimes I wonder whether she is more than one person. In 2017, beyond her research roles at Cornell University and

the Large Hadron Collider, she wrote two finely crafted and passionate articles for the *Bulletin* about scientists’ responsibilities to society, one of which was subsequently adapted for use in *Teen Vogue*. She followed up later in 2017 with a brilliant piece for *Foreign Policy* magazine that explores challenges to scientific freedom at a proposed next-generation subatomic supercollider in China. She regularly advocates on Capitol Hill for the US high-energy physics community and is exactly the type of charismatic emerging leader the Rieser Award was created to encourage.”

The Rieser Award is the capstone of our Next Generation Program, created to ensure that new voices, steeped in science and public policy, have a trusted platform from which to address existential challenges. It is named for Leonard M. Rieser (1922-1998), board chair at the *Bulletin* from 1984 until his death in 1998.

The recipient of the Rieser Award receives a cash award and an annual subscription to the *Bulletin*’s digital journal.

Message from the Editor-in-Chief

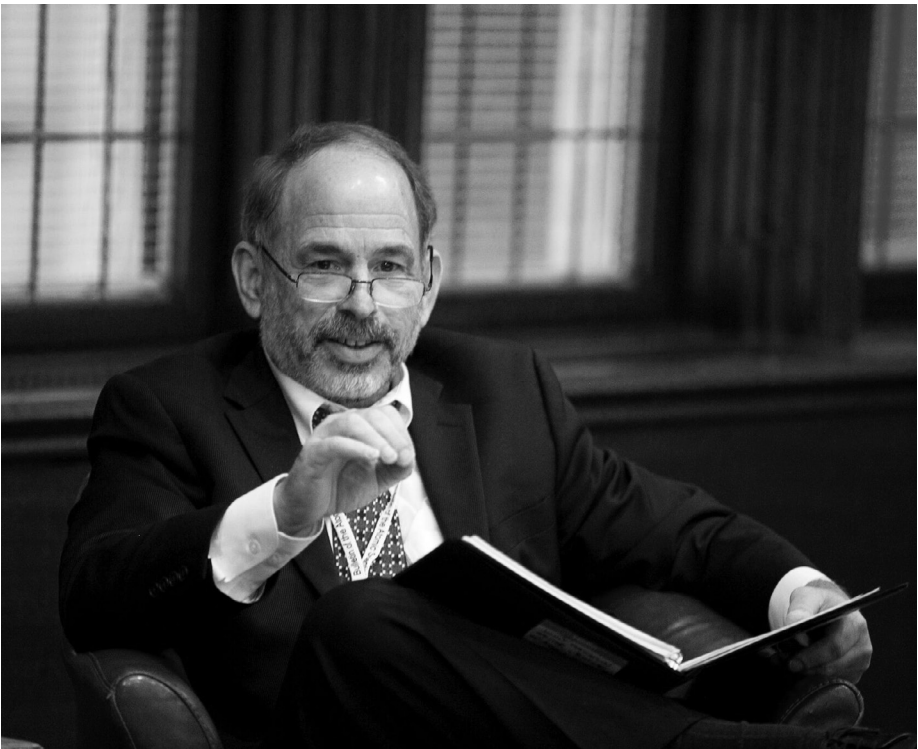
John Mecklin

Last year, as news in our coverage areas dominated world headlines, the *Bulletin* more than rose to the occasion, expanding our readership and influence and breaking a series of important news stories.

As tensions over North Korea’s testing of nuclear weapons and ballistic missiles rose, the *Bulletin* published major stories that were among the site’s traffic leaders, including “North Korea’s ‘not quite’ ICBM can’t hit the lower 48 states,” by MIT’s Ted Postol and two leading German missile experts. The piece—which disputed some public claims that North Korea had a ballistic missile that could reach the continental United States with a nuclear warhead—drove public debate in many quarters (it was cited in *The New York Times* and in a major *Newsweek* article) and was accompanied by a response from David Wright, codirector of the Union of Concerned Scientists’ Global Security Program. Among other high-traffic articles on North Korea were two interviews with *Bulletin* columnist and Stanford nuclear expert Sig Hecker, both of which were also widely cited in the mainstream press.

But nuclear threats were hardly confined to North Korea in 2017 and neither was the *Bulletin*’s coverage. In March, three renowned national security authorities—Hans Kristensen, who writes the Nuclear Notebook column for the *Bulletin* and directs the Nuclear Information Project at the Federation of American Scientists; Matthew McKinzie, who directs the Nuclear Program for the National Resources Defense Council; and MIT ballistic missile expert Ted Postol—wrote “How US nuclear force modernization is undermining strategic stability: The burst-height compensating super-fuze.” The story broke important news about the possibility that the United States had developed a nuclear first strike capability vis-à-vis Russia, drew more than 80,000 readers, and was widely mentioned in the world press, including in an authoritative piece by *Science* magazine.

The *Bulletin* continued to expand its readership and influence significantly in 2017 in all its coverage areas—nuclear risk, climate change, and emerging disruptive technologies—and in a variety of ways that included authoritative special journal issues and inventive, timely, and deep coverage



related to the Trump administration’s undisciplined approach to international affairs and to other news of the day. In our subscription journal, we published groundbreaking packages on the role nuclear power may or may not play in limiting climate change; on nuclear modernization; on the new and dangerous form of international conflict often called “hybrid war”; and on the Trump administration’s less-than-exemplary performance in its first year in regard to nuclear weapons, climate change, and other existential threats to humanity.

On our open-access website, we of course hosted extensive in-depth coverage of nuclear affairs but also weighed in with a remarkable array of coverage on climate change (like Science and Security Board member Ray Pierrehumbert’s “The trouble with geoengineers hacking the planet”) and articles about emerging technological threats (including “Neuroscience—and the new weapons of the mind” by Kings College London experts Robert Bruner and Filippa Lentzos).

Many of our new readers continued to come from the Web-native social media

and news aggregation sites that tend to attract younger audiences, a result, at least in part, of the *Bulletin*’s Voices of Tomorrow program, which published articles by 27 young, emerging experts in 2017. As we grew our audience, the *Bulletin* continued to garner attention from thought-leading publications and top-tier think tanks like *The New York Times*, *The Washington Post*, *The Atlantic*, the Council on Foreign Relations, and Harvard’s Belfer Center for Science and International Affairs.

These increases in readership and impact came as we continued to emphasize top experts and quality writing about the most pressing issue of our time—the preservation of humanity in the face of potentially catastrophic technological threats. With your continued support—for which the entire staff thanks you—the *Bulletin* is well positioned to continue to give these threats the nonpartisan and rigorously expert attention they deserve.

John Mecklin

The Doomsday Clock announcement

Impact tracked around the world

Two Minutes to Midnight

The *Bulletin* hosted a live international news conference from Washington, DC, on January 25, 2018, based on the 2017 deliberations and decisions of the Science and Security Board.

As reporters and videographers listened intently and recorded the proceedings, *Bulletin* leaders underscored the urgency and substance behind the decision, and also participated during the media question and answer session afterward.

The Clock announcement generated a remarkable outpouring of stories and interviews around the world. The coverage was notably more serious and reflective than in previous years.



2.2 million viewed the Clock announcement on Facebook Live.

More than a quarter million read the Doomsday Clock statement in the week after it was published.

Nearly 7,500 news outlets worldwide carried the story.

Activity reflected nearly total Twitter saturation.

Doomsday Clock Features

Al Jazeera

“Nuclear Fears Push Doomsday Clock Closer to Midnight”

BBC

“Doomsday Clock Moved to Just Two Minutes to ‘apocalypse’”

Chicago Tribune

“Doomsday Clock Advances 30 Seconds Closer to the Apocalypse”

Fox News

“What is the Doomsday Clock?”

France 24

“Nuclear Concerns Push ‘Doomsday Clock’ Closer to Midnight”

Hindustan Times

“‘Doomsday Clock’ Now Just 2 Minutes Away From Midnight, and Catastrophe”

Newsweek

“Doomsday Clock Ticks Two Minutes Closer to ‘Midnight’ Apocalypse Because World Leaders Have Failed”

TeenVogue

“Everything You Need to Know About the Doomsday Clock”

Time

“The Doomsday Clock Just Moved Closer to Midnight. Here's What You Need to Know”

The Atlantic

“Shrugging Toward Doomsday”

The Guardian

“‘Doomsday Clock’ ticked forward 30 seconds to 2 minutes to midnight”

The New York Times

“Doomsday Clock Is Set at 2 Minutes to Midnight, Closest Since 1950s”

The Washington Post

“The Doomsday Clock is Now Just 2 Minutes to ‘Midnight,’ the Symbolic Hour of the Apocalypse”

USA Today

“The Doomsday Clock Just Ticked Closer to Midnight”

it is two minutes to midnight



The 2018 Clock Statement

To: Leaders and citizens of the world

In 2017, world leaders failed to respond effectively to the looming threats of nuclear war and climate change, making the world security situation more dangerous than it was a year ago—and as dangerous as it has been since World War II.

The greatest risks last year arose in the nuclear realm. North Korea's nuclear weapons program made remarkable progress in 2017, increasing risks to North Korea itself, other countries in the region, and the United States. Hyperbolic rhetoric and provocative actions by both sides have increased the possibility of nuclear war by accident or miscalculation.

But the dangers brewing on the Korean Peninsula were not the only nuclear risks evident in 2017: The United States and Russia remained at odds, continuing military exercises along the borders of NATO, undermining the Intermediate-Range Nuclear Forces Treaty (INF), upgrading their nuclear arsenals, and eschewing arms control negotiations.

In the Asia-Pacific region, tensions over the South China Sea have increased, with relations between the United States and China insufficient to re-establish a stable security situation.

In South Asia, Pakistan and India have continued to build ever-larger arsenals of nuclear weapons.

And in the Middle East, uncertainty about continued US support for the landmark Iranian nuclear deal adds to a bleak overall picture. To call the world nuclear situation dire is to understate the danger—and its immediacy.

On the climate change front, the danger may seem less immediate, but avoiding catastrophic temperature increases in the long run requires urgent attention now. Global carbon dioxide emissions have not yet shown the beginnings of the sustained decline towards zero that must occur if ever-greater warming is to be avoided. The nations of the world will have to significantly decrease their greenhouse gas emissions to keep climate risks manageable, and so far, the global response has fallen far short of meeting this challenge.

Beyond the nuclear and climate domains, technological change is disrupting democracies around the world as states seek and exploit opportunities to use information technologies as weapons, among them internet-based deception campaigns aimed at undermining elections and popular confidence in institutions essential to free thought and global security.

The *Bulletin of the Atomic Scientists* Science and Security Board believes the perilous world security situation just described would, in itself, justify moving the minute hand of the Doomsday Clock closer to midnight.

But there has also been a breakdown in the international order that has been dangerously exacerbated by recent US actions. In 2017, the United States backed away from its long-standing leadership role in the world, reducing its commitment to seek common ground and undermining the overall effort toward solving pressing global governance challenges. Neither allies nor adversaries have been able to reliably predict US actions—or understand when US pronouncements are real, and when they are mere rhetoric. International diplomacy has been reduced to name-calling, giving it a surreal sense of unreality that makes the world security situation ever more threatening.

Because of the extraordinary danger of the current moment, the Science and Security Board today moves the minute hand of the Doomsday Clock 30 seconds closer to catastrophe. It is now two minutes to midnight—the closest the Clock has ever been to Doomsday, and as close as it was in 1953, at the height of the Cold War.

The Science and Security Board hopes this resetting of the Clock will be interpreted exactly as it is meant—as an urgent warning of global danger. The time for world leaders to address looming nuclear danger and the continuing march of climate change is long past. The time for the citizens of the world to demand such action is now:

#rewindtheDoomsdayClock

It is two minutes to midnight

The untenable nuclear threat

The risk that nuclear weapons may be used—intentionally or because of miscalculation—grew last year around the globe.

North Korea has long defied UN Security Council resolutions to cease its nuclear and ballistic missile tests, but the acceleration of its tests in 2017 reflects new resolve to acquire sophisticated nuclear weapons. North Korea has or soon will have capabilities to match its verbal threats—specifically, a thermonuclear warhead and a ballistic missile that can carry it to the US mainland. In September, North Korea tested what experts assess to be a true two-stage thermonuclear device, and in November, it tested the Hwasong-15 missile, which experts believe has a range of over 8,000 kilometers. The United States and its allies, Japan and South Korea, responded with more frequent and larger military exercises, while China and Russia proposed a freeze by North Korea of nuclear and missile tests in exchange for a freeze in US exercises.

The failure to secure a temporary freeze in 2017 was unsurprising to observers of the downward spiral of nuclear rhetoric between US President Donald Trump and North Korean leader Kim Jong-un. The failure to rein in North Korea's nuclear program will reverberate not just in the Asia-Pacific, as neighboring countries review their security options, but more widely, as all countries consider the costs and benefits of the international framework of nonproliferation treaties and agreements.

Nuclear risks have been compounded by US-Russia relations that now feature more conflict than cooperation. Coordination on nuclear risk reduction is all but dead, and no solution to disputes over the INF Treaty—a landmark agreement to rid Europe of medium-range nuclear missiles—is readily apparent. Both sides allege violations, but Russia's deployment of a new ground-launched cruise missile, if not addressed, could trigger a collapse of the treaty. Such a collapse would make what should have been a relatively easy five-year extension of the New START arms control pact much harder to achieve and could terminate an arms control process that dates back to the early 1970s.

For the first time in many years, in fact, no US-Russian nuclear arms control negotiations are under way. New strategic stability talks begun in April are potentially useful, but so far they lack the energy and political commitment required for them to bear fruit. More important, Russia's invasion and annexation of Crimea and semi-covert support of separatists in eastern Ukraine have sparked concerns that Russia will support similar “hybrid” conflicts in new NATO members that it borders—actions that could provoke a crisis at almost any time. Additional clash points could emerge if Russia attempts to exploit friction between the United States and its NATO partners, whether arising from disputes on burden-sharing, European Union membership, and trade—or relating to policies on Israel, Iran, and terrorism in the Middle East. In the past year, US allies have needed reassurance about American

intentions more than ever. Instead, they have been forced to negotiate a thicket of conflicting policy statements from a US administration weakened in its cadre of foreign policy professionals, suffering from turnover in senior leadership, led by an undisciplined and disruptive president, and unable to develop, coordinate, and clearly communicate a coherent nuclear policy. This inconsistency constitutes a major challenge for deterrence, alliance management, and global stability. It has made the existing nuclear risks greater than necessary and added to their complexity.

Especially in the case of the Iran nuclear deal, allies are perplexed. While President Trump has steadfastly opposed the agreement that his predecessor and US allies negotiated to keep Iran from developing nuclear weapons, he has never successfully articulated practical alternatives. His instruction to Congress in 2017 to legislate a different approach resulted in a stalemate. The future of the Iran deal, at this writing, remains uncertain.

In the United States, Russia, and elsewhere around the world, plans for nuclear force modernization and development continue apace. The Trump administration's Nuclear Posture Review appears likely to increase the types and roles of nuclear weapons in US defense plans and lower the threshold to nuclear use. In South Asia, emphasis on nuclear and missile capabilities grows. Conventional force imbalances and destabilizing plans for nuclear weapons use early in any conflict continue to plague the subcontinent.

Reflecting long decades of frustration with slow progress toward nuclear disarmament, states signed a Treaty on the Prohibition of Nuclear Weapons, commonly known as the ban treaty, at the United Nations this past September. The treaty—championed by the International Campaign to Abolish Nuclear Weapons, which has been awarded the Nobel Peace Prize for its work—is a symbolic victory for those seeking a world without nuclear weapons and a strong expression of the frustration with global disarmament efforts to date. Predictably, countries with nuclear weapons boycotted the negotiations, and none has signed the ban treaty. Their increased reliance on nuclear weapons, threats, and doctrines that could make the use of those weapons more likely stands in stark contrast to the expectations of the rest of the world.

An insufficient response to climate change

Last year, the US government pursued unwise and ineffectual policies on climate change, following through on a promise to derail past US climate policies. The Trump administration, which includes avowed climate denialists in top positions at the Environmental Protection Agency, the Interior Department, and other key agencies, has announced its plan to withdraw from the Paris Agreement. In its rush to dismantle rational climate and energy policy, the administration has ignored scientific fact and well-founded economic analyses.



It is two minutes to midnight

These US government climate decisions transpired against a backdrop of worsening climate change and high-impact weather-related disasters. This year past, the Caribbean region and other parts of North America suffered a season of historic damage from exceedingly powerful hurricanes. Extreme heat waves occurred in Australia, South America, Asia, Europe, and California, with mounting evidence that heat-related illness and death are correspondingly increasing. The Arctic ice cap achieved its smallest-ever winter maximum in 2017, the third year in a row that this record has been broken. The United States has witnessed devastating wildfires, likely exacerbated by extreme drought and subsequent heavy rains that spurred underbrush growth. When the data are assessed, 2017 is almost certain to continue the trend of exceptional global warmth: All the warmest years in the instrumental record, which extends back to the 1800s, have—excepting one year in the late 1990s—occurred in the 21st century.

Despite the sophisticated disinformation campaign run by climate denialists, the unfolding consequences of an altered climate are a harrowing testament to an undeniable reality: The science linking climate change to human activity—mainly the burning of fossil fuels that produce carbon dioxide and other greenhouse gases—is sound. The world continues to warm as costly impacts mount, and there is evidence that overall rates of sea level rise are accelerating—regardless of protestations to the contrary.

Especially against these trends, it is heartening that the US government’s defection from the Paris Agreement did not prompt its unraveling or diminish its support within the United States at large. The “We Are Still In” movement signals a strong commitment within the United States—by some 1,700 businesses, 250 cities, 200 communities of faith, and nine states, representing more than 40 percent of the US population—to its international climate commitments and to the validity of scientific facts.

This reaffirmation is reassuring, and other countries have maintained their steadfast support for climate action, reconfirmed their commitments to global climate cooperation, and clearly acknowledged that more needs to be done. French President Emmanuel Macron’s sober message to global leaders assembled at December’s global climate summit in Paris was a reality check after the heady climate negotiations his country hosted two years earlier: “We’re losing the battle. We’re not moving quickly enough. We all need to act.” And indeed, after plateauing for a few years, greenhouse gas emissions resumed their stubborn rise in 2017. As we have noted before, the true measure of the Paris Agreement is whether nations actually fulfill their pledges to cut emissions, strengthen those pledges, and see to it that global greenhouse gas emissions start declining in short order and head toward zero. As we drift yet farther from this goal, the urgency of shifting course becomes greater, and the existential threat posed by climate change looms larger.

Emerging technologies and global risk

The Science and Security Board is deeply concerned about the loss of public trust in political institutions, in the media, in science, and in facts themselves—a loss that the abuse of information technology has fostered. Attempts to intervene in elections through sophisticated hacking operations and the spread of disinformation have threatened democracy, which relies on an informed electorate to reach reasonable decisions on public policy—including policy relating to nuclear weapons, climate change, and other global threats. Meanwhile, corporate leaders in the information domain, including established media outlets and internet companies such as Facebook and Google, have been slow to adopt protocols to prevent misuse of their services and protect citizens from manipulation. The international community should establish new measures that discourage and penalize all cross-border subversions of democracy.

Last year, the Science and Security Board warned that “[t]echnological innovation is occurring at a speed that challenges society’s ability to keep pace. While limited at the current time, potentially existential threats posed by a host of emerging technologies need to be monitored, and to the extent possible anticipated, as the 21st century unfolds.”

If anything, the velocity of technological change has only increased in the past year, and so our warning holds for 2018. But beyond monitoring advances in emerging technology, the board believes that world leaders also need to seek better collective methods of managing those advances, so the positive aspects of new technologies are encouraged and malign uses discovered and countered. The sophisticated hacking of the “Internet of Things,” including computer systems that control major financial and power infrastructure and have access to more than 20 billion personal devices; the development of autonomous weaponry that makes “kill” decisions without human supervision; and the possible misuse of advances in synthetic biology, including the revolutionary Crispr gene-editing tool, already pose potential global security risks. Those risks could expand without strong public institutions and new management regimes. The increasing pace of technological change requires faster development of those tools.

How to turn back the Clock

In 1953, former Manhattan Project scientist and *Bulletin* editor Eugene Rabinowitch set the hands of the Doomsday Clock at two minutes to midnight, writing, “The achievement of a thermonuclear explosion by the Soviet Union, following on the heels of the development of ‘thermonuclear devices’ in America, means that the time, dreaded by scientists since 1945, when each major nation will hold the power of destroying, at will, the urban civilization of any other nation, is close at hand.”



It is two minutes to midnight

The Science and Security Board now again moves the hands of the Clock to two minutes before midnight. But the current, extremely dangerous state of world affairs need not be permanent. The means for managing dangerous technology and reducing global-scale risk exist; indeed, many of them are well-known and within society’s reach, if leaders pay reasonable attention to preserving the long-term prospects of humanity, and if citizens demand that they do so.

This is a dangerous time, but the danger is of our own making. Humankind has invented the implements of apocalypse; so can it invent the methods of controlling and eventually eliminating them. This year, leaders and citizens of the world can move the Doomsday Clock and the world away from the metaphorical midnight of global catastrophe by taking these common-sense actions:

- US President Donald Trump should refrain from provocative rhetoric regarding North Korea, recognizing the impossibility of predicting North Korean reactions.

- The US and North Korean governments should open multiple channels of communication. At a minimum, military-to-military communications can help reduce the likelihood of inadvertent war on the Korean Peninsula. Keeping diplomatic channels open for talks without preconditions is another common-sense way to reduce tensions. As leading security expert Siegfried Hecker of Stanford University recently wrote: “Such talks should not be seen as a reward or concession to Pyongyang, nor construed as signaling acceptance of a nuclear-armed North Korea. They could, however, deliver the message that while Washington fully intends to defend itself and its allies from any attack with a devastating retaliatory response, it does not otherwise intend to attack North Korea or pursue regime change.”

- The world community should pursue, as a short-term goal, the cessation of North Korea’s nuclear weapon and ballistic missile tests. North Korea is the only country to violate the norm against nuclear testing in 20 years. Over time, the United States should seek North Korea’s signature on the Comprehensive Nuclear Test Ban Treaty—and then, along with China, at long last also ratify the treaty.

- The Trump administration should abide by the terms of the Joint Comprehensive Plan of Action for Iran’s nuclear program unless credible evidence emerges that Iran is not complying with the agreement or Iran agrees to an alternative approach that meets US national security needs.

- The United States and Russia should discuss and adopt measures to prevent peacetime military incidents along the borders of NATO. Provocative military exercises and maneuvers hold the potential for crisis escalation. Both militaries must exercise restraint and professionalism, adhering to all norms developed to avoid conflict and accidental encounters.

- US and Russian leaders should return to the negotiating table to resolve differences over the INF treaty; to seek further reductions in

nuclear arms; to discuss a lowering of the alert status of the nuclear arsenals of both countries; to limit nuclear modernization programs that threaten to create a new nuclear arms race; and to ensure that new tactical or low-yield nuclear weapons are not built and that existing tactical weapons are never used on the battlefield.

- US citizens should demand, in all legal ways, climate action from their government. Climate change is a real and serious threat to humanity. Citizens should insist that their governments acknowledge it and act accordingly.

- Governments around the world should redouble their efforts to reduce greenhouse gas emissions so they go well beyond the initial, inadequate pledges under the Paris Agreement. The temperature goal under that agreement—to keep warming well below 2 degrees Celsius above preindustrial levels—is consistent with consensus views on climate science, is eminently achievable, and is economically viable, provided that poorer countries are given the support they need to make the post-carbon transition. But the time window for achieving this goal is rapidly closing.

- The international community should establish new protocols to discourage and penalize the misuse of information technology to undermine public trust in political institutions, in the media, in science, and in the existence of objective reality itself. Strong and accountable institutions are necessary to prevent deception campaigns that are a real threat to effective democracies, reducing their ability to enact policies to address nuclear weapons, climate change, and other global dangers.

- The countries of the world should collaborate on creating institutions specifically assigned to explore and address potentially malign or catastrophic misuses of new technologies, particularly as regards autonomous weaponry that makes “kill” decisions without human supervision and advances in synthetic biology that could, if misused, pose a global threat.

The failure of world leaders to address the largest threats to humanity’s future is lamentable—but that failure can be reversed. It is two minutes to midnight, but the Doomsday Clock has ticked away from midnight in the past, and during the next year, the world can again move it further from apocalypse. The warning the Science and Security Board now sends is clear, the danger obvious and imminent. The opportunity to reduce the danger is equally clear.

The world has seen the threat posed by the misuse of information technology and witnessed the vulnerability of democracies to disinformation. But there is a flip side to the abuse of social media. Leaders react when citizens insist they do so, and citizens around the world can use the power of the internet to improve the long-term prospects of their children and grandchildren. They can insist on facts, and discount nonsense. They can demand action to reduce the existential threat of nuclear war and unchecked climate change. They can seize the opportunity to make a safer and saner world.

They can #rewindtheDoomsdayClock.

Growth continues, milestones marked

The *Bulletin's* editorial reach grew dramatically in 2017. Traffic to our open website increased by more than 46 percent in 2017 over the previous year, with about 2.8 million visits versus some 1.9 million in 2016. The site garnered almost 1.5 million more page views in 2017 than in 2016 (an increase of 52 percent over the preceding year), and our analytics show that visitor engagement was up by all measures. This growth in readership and impact came as news in the *Bulletin's* coverage areas dominated world headlines and the *Bulletin* more than rose to the occasion.

Nuclear Notebook



Marking 30 years publishing Nuclear Notebook
Since 1987, the *Bulletin* has published the Nuclear Notebook, an authoritative accounting of world nuclear arsenals compiled by top experts from the Federation of American Scientists. Today, it is prepared by Hans M. Kristensen and Robert S. Norris of FAS. The Nuclear Notebook is housed at Taylor & Francis Online, home of our digital journal. Because of its importance, the Nuclear Notebook is always free-to-access.

More interactives launched

Global nuclear power database
This interactive visualization on nuclear power reactor construction reflects the history and scope of nuclear power reactor construction since 1951. Forty-one nations have engaged in the construction of 754 nuclear reactors during that period. The information in this data visualization is based on the *World Nuclear Industry Status Report (WNISR) Database*, a Mycle Schneider Consulting project, updated to January 1, 2017. The visualization was developed by WNISR and Visioncarto for the *Bulletin*, with support from the Pulitzer Center on Crisis Reporting. *Additional updates are made as needed.*



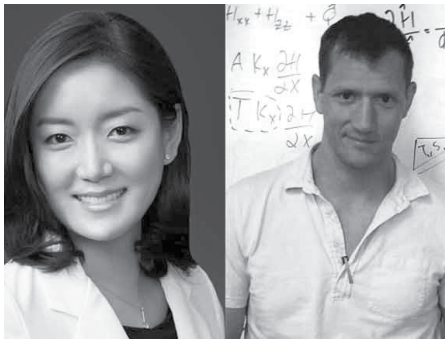
Know the Time
The *Bulletin's* animation of global risk over time was produced by Fabian Stricker. The brief but powerful video juxtaposes the growth of nuclear arsenals around the world with the Doomsday Clock moving in response to the risks.

+126%
Facebook likes

+58%
Twitter followers

+43% in
e-newsletter subscribers

New columnists welcomed



Duyeon Kim and Kurt Zenz House
The *Bulletin* announced the addition of two new columnists to our roster of contributors. Duyeon Kim, at left, is a visiting senior fellow at the Korea Peninsula Future Forum, a think tank run by former South Korean national security advisor Ambassador Chun Yung-woo. Her column covers nuclear security and geopolitical affairs on the Korean Peninsula and across Northeast Asia.

Kurt Zenz House is the chief executive and a co-founder of C12 Energy. Beginning in spring of 2018, his column will cover the science and economics of mitigating climate change.

2.8 million
website visitors

Over 4.3 million
website page views

Nearly half of our
audience is from
outside the US.

53% < 35 years old

71% < 45 years old

Checking in with leading thinkers



**“As much death as you want”:
UC Berkeley’s Stuart Russell on
“Slaughterbots”**
Lucien Crowder, December 2017

At 7 minutes and 47 seconds, “Slaughterbots” is fast-moving, hyper-realistic, anxiety-laden, and deeply creepy. The prime mover behind the film is Stuart Russell, a professor of computer science at the University of California, Berkeley. Russell checked in with the *Bulletin* to explain how the film was made, and how little stands between us and the drone apocalypse.

**NUKEMAP creator Alex Wellerstein
puts nuclear risk on the radar**
Elisabeth Eaves, June 12, 2017

In 2012, science historian Alex Wellerstein created NUKEMAP, an online tool that lets users pick a place, pick a type of nuclear weapon, and click a red button that says “detonate” to see the devastating results. By May of 2017, NUKEMAP had enabled about 113 million “detonations” by users all over the world. Wellerstein talked to the *Bulletin* about why the tool is so popular.

**Bob Inglis: A conservative for
climate action**
Dawn Stover, November 2, 2017

Former Republican Congressman Bob Inglis talked to the *Bulletin* about how he became a climate hawk, how to get past conservative resistance to climate solutions, and reasons for optimism at a time when the White House is in rapid retreat from domestic and international action on climate.

Experts shaped the debate

**What should the US biodefense
strategy look like?**
Laura H. Kahn, November 8, 2017

“In 2015, the Blue Ribbon Study Panel on Biodefense concluded that the United States still needed a single coordinated biodefense strategy,” said Laura Kahn in her article describing why it looks like we may just be getting one.

A visit to Russia’s secret nuclear labs
Siegfried S. Hecker, March 1, 2017

“Today the United States and Russia may be entering a new arms race, but 25 years ago things were different,” said Sig Hecker, describing a remarkable period of scientific cooperation between the two countries that began in 1992.



**Shoddy translation in the
Western media is increasing
nuclear tensions—again**
Ariane Tabatabai, August 24, 2017

Western, English-language journalism on Iranian nuclear affairs suffers from misunderstandings and mistakes that needlessly create misunderstandings and heighten tension in the Middle East.

**Fusion reactors: Not what they’re
cracked up to be**
Daniel Jassby, March 19, 2017

Long touted as the “perfect” energy source, fusion reactors share many drawbacks with fission—and even add a few new ones of their own, according to Daniel Jassby.

Year One report card delivered

Four experts assessed the Trump administration’s performance on key global security topics in the December issue of the *Bulletin's* digital magazine.

**Through a fractured looking-glass:
Trump’s nuclear decisions so far**
Sharon Squassoni

The Trump administration has no shortage of new approaches to old problems, but the impatience exhibited by the US commander-in-chief appears to make implementation difficult.

**Real-world headwinds for
Trump climate change policy**
Joseph E. Aldy

The US president has called the scientific evidence for climate change “a hoax,” vowed to deregulate the American economy, and bring back jobs that he claimed were lost in combatting the rise in global atmospheric temperatures. What’s next?

**The administration’s misaligned
approach to national biodefense**
Reid Kirby

The Trump administration, as mandated by law, is creating a new national strategy for biodefense. The ultimate aim of a biodefense strategy is to provide security – but the administration’s processes for strategy formulation and execution are fundamentally mismatched with the goal of improving security.

**Moving slowly, not breaking enough:
Trump’s cybersecurity
accomplishments**
Steven Weber and Betsy Cooper

At the beginning of Trump’s presidency, he and Silicon Valley might have found some common ground on cybersecurity. That has not happened.

Financials

Management discussion and analysis

The *Bulletin* has had a successful year from a development perspective, achieving growth in foundation and donor giving. As you will see on page 25 of this Annual Report, the *Bulletin* received a major gift from Mary Patricia Dougherty. We are deeply thankful for her trust in and support of the *Bulletin's* ongoing efforts. This gift helped turn a successful year into a very successful year, evidenced by the significant increase in Unrestricted Net Assets in 2017 in the chart to the right.


The *Bulletin* is fortunate to have received multiyear support from several major foundations, and these grants have allowed our unrestricted net assets to grow steadily over the past five years. However, because of the requirements mandated by generally accepted accounting principles (GAAP), we—like our counterparts—are required to recognize the full multiyear gift in the first year in which it was received although the funds may not be received then and will not be utilized until the ensuing years of the grant. For example, a \$500,000 two-year grant would be reported as \$500,000 of revenue in year one and nothing in year two, notwithstanding the fact that the money is spent somewhat evenly over the course of the two years. To manage the resulting lumpiness in revenue recognition, we temporarily restrict revenues from one year to the next for each grant, as can be seen under “Revenue from Foundation Grants” in the Statement of Activities under Total Revenue and Other Support included in this Annual Report on page 21 and below under Net Assets.

Specifically, we restrict revenue in the first year of the grant, in anticipation of planned expenses in subsequent years. The “Unrestricted Net Assets” table presented to the right, provides a clearer picture of the *Bulletin's* growth, and of the resources available each year. I consider our ability to secure multiple-year support a strong endorsement of our efforts, notwithstanding the confusing accounting treatment it mandates. In making multiyear commitments, our supporters are providing external validation of our governance, impact, and strategic approach.

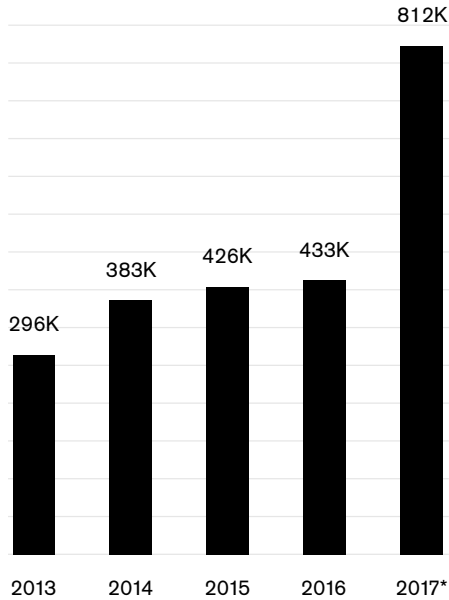
STATEMENT OF FINANCIAL POSITION

	2017	2016	2015	2014	2013
TOTAL CURRENT ASSETS	1,842,605	810,829	1,342,656	453,831	400,138
PROPERTY AND EQUIPMENT, NET	7,800	4,317	5,297	6,450	9,481
TOTAL ASSETS	1,850,405	815,146	1,347,953	460,281	409,619
TOTAL LIABILITIES	66,944	103,465	148,146	53,135	59,669
NET ASSETS					
Unrestricted	812,199	433,611	426,055	383,179	296,423
Temporarily restricted	971,262	278,070	773,752	23,967	53,527
TOTAL NET ASSETS	1,783,461	711,681	1,199,807	407,146	349,950
TOTAL LIABILITIES & NET ASSETS	1,850,405	815,146	1,347,953	460,281	409,619

Our financial reporting is designed to provide donors and the public with a transparent overview of our finances. If you have any questions about this report or need additional financial information, please contact the *Bulletin's* Finance Director, Lisa McCabe at lmccabe@thebulletin.org.

Sincerely,

Rachel Bronson, PhD
President and CEO

UNRESTRICTED NET ASSETS



* includes major gift from Mary Patricia Dougherty

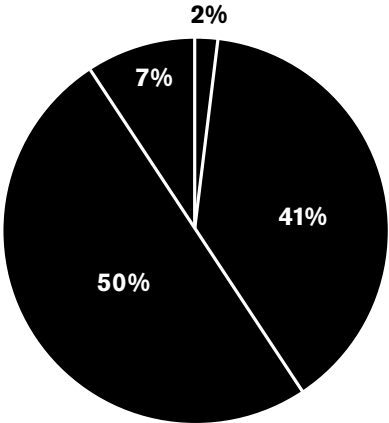
Financials

STATEMENT OF FINANCIAL POSITION

	2017	2016
Assets		
Cash/Investments	1,106,612	644,568
Accounts Receivable, net of allowance	61,960	52,904
Pledges Receivable	662,597	106,851
Prepaid Expenses	11,438	6,506
Total Current Assets	1,842,605	810,829
Property and Equipment	7,800	4,317
Total Assets	1,850,405	815,146
Liabilities and Net Assets		
Accounts Payable	65,639	77,786
Accrued Expenses	—	24,708
Deferred Subscription Revenue	1,305	971
Total Liabilities	66,944	103,465
Net Assets		
Unrestricted	812,199	433,611
Temporarily Restricted	971,262	278,070
Total Net Assets	1,783,461	711,681
Total Liabilities and Net Assets	1,850,405	815,146

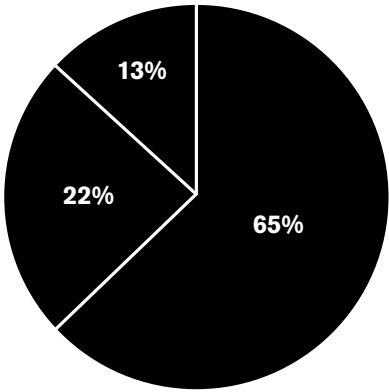
STATEMENT OF ACTIVITIES

	2017	2016
Revenue & Other Support		
Publication	180,412	165,512
Donor Support	1,038,242	530,633
Foundation Grants	1,280,500	215,483
Corporation Support	37,000	45,000
Other Revenue	21,921	100
In-Kind	660,000	535,968
Total Revenue & Other Support	3,218,075	1,492,696
Expenses by Function		
Program Services	1,370,034	1,417,227
Fundraising	263,567	297,185
General Administration	512,692	266,410
Total Operating Expenses	2,146,293	1,980,822
Operating Income (loss)	1,071,783	(488,126)
Temporarily Restricted Revenue	956,357	127,455
Revenue Released From Restrictions	263,165	623,137
Net Income from Operations	378,591	7,556
Net Assets at the Beginning of the Year	711,679	1,199,806
Net Assets at the End of the Year	1,783,461	711,679



Operating Revenue

Donor Support	41%
Foundation Grants	50%
Publication	7%
Other Revenue	2%



Operating Expenses

Program Services	65%
General Administration	22%
Fundraising	13%

The Annual Meeting and Dinner

Highlights



Looking Ahead

Annual Meeting & Dinner
Thursday, November 8, 2018
University Club of Chicago

2017 Annual Meeting group sessions

- Integrating Art and Science*
Eugenia Cheng, Scientist in Residence, School of the Art Institute of Chicago
- Is National Intelligence an Advantage or Vulnerability?*
Jennifer Sims, Senior Fellow at The Chicago Council on Global Affairs
- Nuclear Weapons in the 21st Century*
Sharon Squassoni, Senior Fellow and Director of the Proliferation Prevention Program at the Center for Strategic and International Studies
- The US Budget and its Implications for Addressing Climate Change*
David Titley, Founding Director of the

- Center for Solutions to Weather and Climate Risk and Professor of Practice in Meteorology and Professor in International Affairs at The Pennsylvania State University
- Existential Threats from Cyberspace—The Big Picture*
Herb Lin, Senior Research Scholar for Cyber Policy and Security at the Center for International Security at Stanford University and the Cooperation and Research Fellow at the Hoover Institution at Stanford University
- Biodefense—Are We Safe Enough?*
Suzet McKinney, Executive Director of the Illinois Medical District Commission
- The 75th Anniversary of Enrico Fermi's First Sustaining Nuclear Reaction, and Its Implications for Today's Scientific Landscape*

Attendees discuss global challenges

Concerned citizens, donors, and other stakeholders participated in the *Bulletin's* 2017 Annual Meeting to engage directly with leading science and security experts. Preceding the Annual Dinner, the meeting offered attendees a series of discussions led by members of the *Bulletin's* Science and Security Board, and its Board of Sponsors.

1. Patricia Ward, director of Science Exhibitions and Partnerships at the Museum of Science and Industry.
2. Science and Security Board member Jon Wolfsthal, left, with Han Sung-joo, honorary chairman of the International Policy Studies Institute of Korea and professor emeritus at Korea University.
3. Author and Science and Security Board member Elizabeth Kolbert, leading a session on climate change with *Bulletin* Editor-in-Chief John Mecklin.
4. Science and Security Board member Sivan Kartha, left, and Governing Board member Mark Ratner, participate in another session

- Robert Rosner, William E. Wrather Distinguished Service Professor in the Department of Astronomy and Astrophysics and Physics at the University of Chicago.
- Storm Clouds over North East Asia: A View from South Korea*
Han Sung-joo, Ambassador of the Republic of Korea to the United States (2003-2005), Minister of Foreign Affairs (1993-94)
- Biodiversity Elegy*
Elizabeth Kolbert, Staff Writer, *The New Yorker*, in conversation with John Mecklin, Editor in Chief, *Bulletin of the Atomic Scientists*
- The War on Science, Why It Matters, What Needs to be Done*
Lawrence Krauss, Founding Director, Origins Project, Arizona State University

The Annual Meeting and Dinner

More highlights

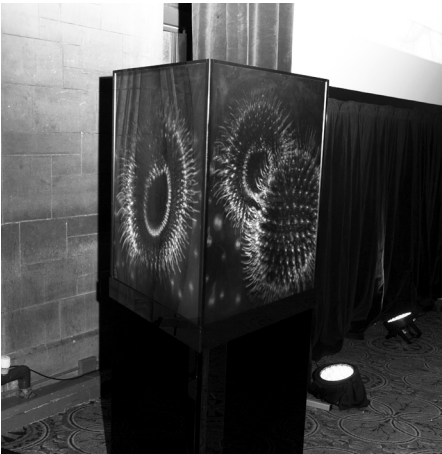
2017 Annual Dinner recognizes art and science leaders

The *Bulletin's* 2017 Annual Dinner on November 6 in Chicago featured nuclear and cyber security expert David E. Sanger, national security correspondent for *The New York Times*. Former Secretary of Defense and Board of Sponsors Chair William Perry also addressed the 225 guests on nuclear issues.

The *Bulletin* honored Ellen Sandor, founder and director of the collaborative artists group (art)n, pictured at right with her husband Richard Sandor. She is a pioneering artist with a longstanding commitment to integrating art and science. A special installation of Sandor's art was on view for our guests.

The center photograph presents one of several Digital PHS Colograms from the virtual reality installation titled "Have a Nice Day," created by Sandor and her team. The cologram includes "a painterly mountainscape inspired by Martyl's 'Tent Rocks,'" looming in the background, "ominously juxtaposed with Martyl's 'Doomsday Clock,' initially designed as a magazine cover for the *Bulletin's* print magazine."

At the bottom is The Magnificent Micelle, a three-sided PHSCologram sculpture with images depicting the incredible nanoparticle, micelle. Continuing a tradition of blending art and science, Sandor and (art)n worked with University of Chicago's Institute for Molecular Engineering's Director and Professor, Mathew Tirrell and his colleagues along with Peter Allen, Scientific Visual Director at the University of California.



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The University of Chicago's Harris School of Public Policy

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Mary Patricia Dougherty and
Frances Tarlton "Sissy" Farenthold
Lee Francis and Michelle Gittler
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Debra Petrides Lyons
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Richard and Ellen Sandor
Family Foundation

- Teacher/Educator Sponsor**
Daniel Casey and Dolores Connolly
Kendal and Ken Gladish
Wintrust Commercial Banking

The Annual Meeting and Dinner

More highlights



1. Keynote Speaker David Sanger
2. Former US Secretary of Defense and Board of Sponsors Chair William Perry
3. David Wargowski with Debra Petrides Lyons, who contributed to the centerpieces mushroom-shaped bottles of CheerNoble, a "decidedly disarming vodka, supporting the *Bulletin*."
4. Governing Board member Steve Ramsey with Sissy Farenthold, Mary Patricia Dougherty, and Ann Jones.
5. From left, Senior Editor Lucien Crowder with Science and Security Board members Daniel Holz and Herb Lin.
6. Michael Phenner and Governing Board member Marjorie Benton.
7. Brian Hanson, John Sirek, Eleanor Meyers, Robert Meyers.



With gratitude

Recognizing thoughtful philanthropy

Environmental activist makes major gift



"A free press is fundamental to a democratic society. I support individual engagement that can inform public policy and inspire change, and I am interested in engaging tomorrow's leaders in creating a safer and healthier planet—partnering with the *Bulletin* is the best way I can think of to do just that."

Mary Patricia Dougherty

Mary Patricia Dougherty, a valued member of our community, made a generous gift of privately held stock to help advance the *Bulletin's* mission and strategic goals.

Dougherty is the president of the Dudley T. Dougherty Foundation; founder of SDR Information Systems, a GPS-based mapping and energy tracking firm; and a director of H&D Operating Company. As a business leader and activist, Dougherty is deeply engaged in shaping the future of Texas' energy sector.

Her many interests include land and water conservation, promoting a green economy, supporting the fledgling algae industry in alternative energy, and women's leadership.

The *Bulletin* is enormously grateful for Doherty's confidence. Her gift will have a profound impact on the *Bulletin's* future and will help it advance evidence-based journalism at the cutting-edge of science and technology. Her generosity will strengthen the organization's financial position and allow it to respond in more nimble and effective ways to the fast-growing demand for our content.

In very real ways, the gift cuts to the heart of what the *Bulletin* is about—protecting and enhancing serious discussion about the planet's most consequential challenges, whether they are in or out of the spotlight.

Dougherty's gift was made in memory of Mr. Dudley Calhoun Dougherty, Ms. Mayra Ortiz Salinas, and Mrs. Lillie M. Tijerina.

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The *Bulletin* recognizes leadership gifts of \$1,000 or more with membership in the Einstein Circle, which celebrates and honors those who offer their financial support at the highest levels. Einstein Circle members make a personal statement about their belief in the inherent value of evidence-based research and analysis to address the most pressing challenges facing our planet and its inhabitants. Einstein Circle membership is recognized annually and is based on the total of gifts, pledge payments, and matching gifts received in a single fiscal year (January 1 through December 31).

Loyal donors remember the *Bulletin*



The *Bulletin* is grateful for the foresight and generosity of the late Lloyd and Judith Shore. By remembering the *Bulletin* in their estate plans, they helped to ensure the future of fact-based journalism.

The Shores were active citizens throughout their lives. Both born in Chicago, they met in 1942 when Judith was working as a secretary for the Chemical Warfare Procurement and Lloyd was a 2nd lieutenant—brought together the year of the first human-made self-sustaining nuclear chain reaction.

Lloyd served on the *Bulletin's* Board of Directors from 1982 to 1988 and was instrumental in his support of the Rabinowitch Essay Competition (named in 1981, after the *Bulletin's* founding Editor Eugene Rabinowitch).

Legacy Society

The Legacy Society was established to recognize and honor friends of the *Bulletin* who have provided for the organization through a future gift. Individuals can create their own legacy by including the *Bulletin* in their will or trust or by designating the *Bulletin* as a beneficiary of a life insurance, IRA, or other financial vehicle. Legacy Society members' special commitment serves as an example to others, and ensures that the *Bulletin* will be here for the next generation and beyond.

With gratitude

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For more than seven decades, a dedicated network of board members, advisors, foundations, and donors have sustained the *Bulletin of the Atomic Scientists*. We extend our deepest gratitude to the board leaders, individuals, and institutions who made contributions between January 1 and December 31, 2017. Their names are listed here, with our sincere thanks for making everything we do possible.

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