

***Speech for the Solidarity for Humanity rally  
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***James Beacham***

My name is James Beacham, and I'm a particle physicist at the Large Hadron Collider, at CERN, just up the road, the place where my colleagues and I search for things like dark matter, gravitons, exotic Higgs bosons, and quantum black holes. A few days ago I was having coffee with some colleagues, one from Brazil and one from Australia. I mentioned that I needed some expertise with a project I was working on, a search for a new type of particle, and my colleagues suggested a couple of people I should talk to, one from Japan and one from South Africa. So I walked down to their offices and arranged a meeting for later that day with all of us plus the other physicists working on this project with me, from Mexico, France, Slovenia, South Korea, Germany, Spain, Sweden, Turkey, Romania, Norway, China, and Morocco, and we all sat down and discussed the project, what we did and did not understand about our experimental apparatus and our data, outlined our challenges, assigned tasks and hammered out a way forward on the project. And then we all had a beer together.

As you can see, big, boundary-pushing science, like that done at CERN, is only possible with two key things: 1) A truly global, multicultural group of physicists and technicians to bring a multitude of perspectives and healthy skepticisms to our research and 2) the universal tenet that logic and reason, applied in controlled, experimental conditions, are humanity's best tools for determining truth from falsehood. This second one is also known as science. It was the successful utilization of these two key things that led to my colleagues and I to the discovery of the Higgs particle, in 2012, and to a Nobel Prize as a result of this discovery. These two key things, in particle physics alone, have also led to ancillary inventions and discoveries like the development of the World Wide Web — here at CERN — major advances in electrical power and new techniques for detecting cancer, among others. But these two key things are also fundamental to the greatest, proudest achievements of science — not just the discovery of the Higgs boson, but the Hubble Space Telescope, the sequencing of the human genome, the development of quantum mechanics, the International Space Station, the exploration of Mars, the verification of neutrino oscillations, and the discovery of gravitational waves. All of these were only possible with the patient dedication and expertise of a multitude of people from all backgrounds and identities working together using the fundamental tenets of science.

And these two key things, multiculturalism and scientific thinking, are currently being undermined and vilified to an alarming degree around the world, particularly in the statements, attitudes and behaviors of Donald Trump and those around him.

Others can speak and have spoken here about the essential importance of multiculturalism with much more authority than I can. But I'm here to remind you of the essential importance of the

other part, scientific thinking. Because the skills we rely upon to do science, and to push the boundaries of objective human knowledge, and to sort fact from falsehood — reason, critical thinking techniques, logic, source critique, and a willing admission of uncertainties and limitations — are the same ones that enable us to build a rational, informed populace that knows how to resist authoritarianism.

And it's bizarre that I even need to say what I'm about to say, in 2017: Facts are real, and they exist irrespective of your belief system. The data don't care about what you want to be true. But right now we're confronted with a strain of politics that undermines the very concepts of truth and fact. If we don't speak up, the consequences will be large. The consequences for individual sciences will probably be minor, but the consequences for the concept of rational inquiry will most probably lead to a complete catastrophe for humanity — due to global warming. Make no mistake: According to my climate scientist colleagues, global warming, due to human use of fossil fuels, is a fact, the same way that gravity, evolution, and the existence of the Higgs boson are facts. These facts have nothing to do with whether you want them to be true, or if you believe in them. Belief has nothing to do with it. This is established, objective science. But a large percentage of the populace has forgotten this. And if we let anti-science people who like to yell loudly get away with questioning the ability of science to do its job, to sort fact from falsehood, then we will all suffer immeasurably. The current refugee crisis will pale in comparison to the number of people who will be displaced from rising ocean levels near coastal areas. Bigoted, anti-science mentalities will affect us all. In addition to all the other things needing defending you've heard about today, we need to defend scientific thinking as well as multiculturalism.

How do we do this? The world has gone topsy-turvy, it seems. Well, when that happens, we have to adapt. We need to go somewhat topsy-turvy along with it, with respect to our habits. To defend these things, we have to gain a new habit, today, right now, no cheating: Speak up.

Some people will laugh at me for being optimistic, but this undercutting of everything that humans hold dear — and this isn't a partisan issue; Trump supporters are going to suffer under this administration, too — has been a shock. But a shock can inspire true progressive reform. Sometimes a shock is what it takes to inspire the populace to speak up. To fight back, to rise up, to resist, and to finally say, "No more. Every human being deserves dignity. Science is real. And white supremacists have no place in an open, democratic society."

But what does it mean, speak up? It means many things.

Most basically, it means not remaining silent, and it means shouting down bigotry, intolerance and anti-scientific thinking. It means saying something in the face of injustice. Authoritarians and autocrats love it when you pre-obey them. Don't do that. Speak up.

For American citizens, our new "speak up" habit means calling your congresspersons. You have three people in congress who work specifically for you. You need to calendar time to call

them — this is our new habit, remember — and tell them that if they don't fight the new bigoted, anti-science agenda, you'll replace them in the next election.

And for a few of you, this is where "speak up" gets even better: You should consider moving back to the U.S. to run for office yourself, or to help a friend do so. Remember, our new normal is to speak up. Our new normal is activism, and activism is no longer optional. It's a part of citizenship. It's your duty, your duty to humanity, to multiculturalism, and to scientific thinking. It's your new habit. And if we really want to take the reins away from the bigots, misogynists, racists, and those who are undermining science, the best way is to take the reins for ourselves. The person who helps restore democracy and progressive values very well may be Congressperson You. Vulnerable people-groups throughout the United States will thank you. Oppressed peoples around the world will thank you. My physicist colleagues from all over the globe will thank you. And if you're able to assist us in addressing human-caused global warming, then humanity itself will thank you. Thank you.