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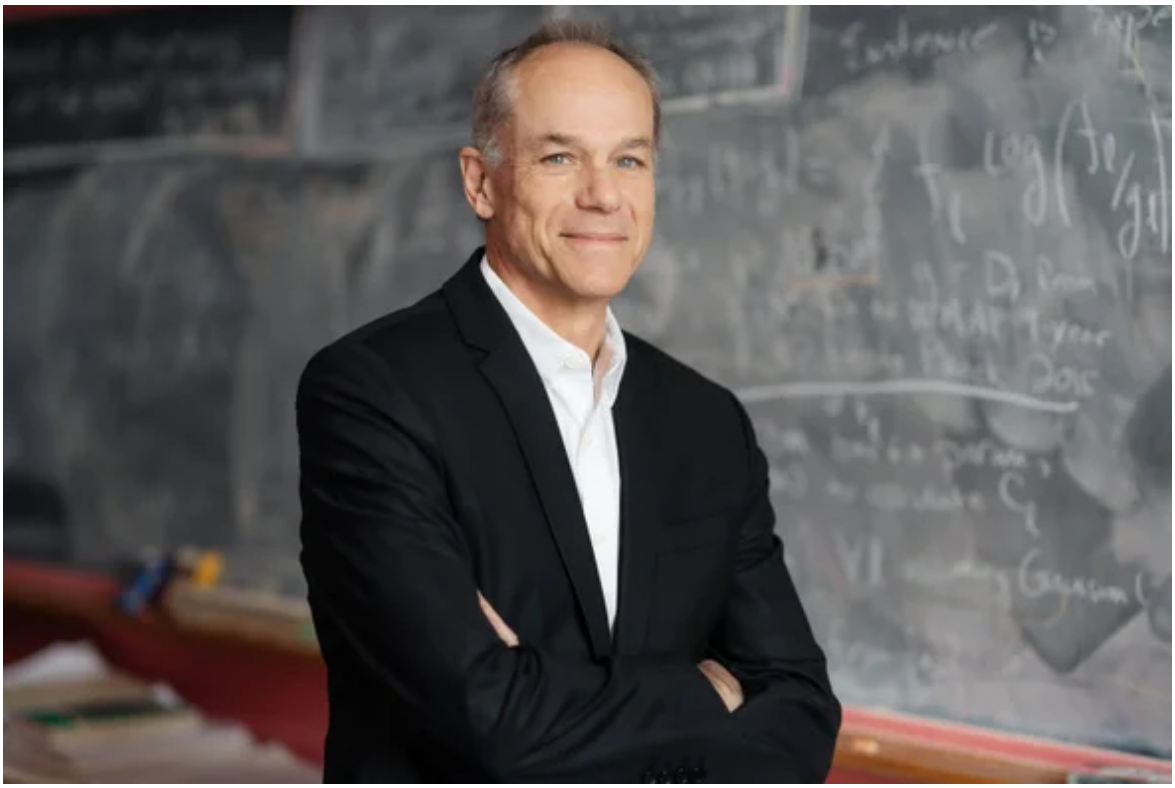
PHYSICS

Atheism Is Inconsistent with the Scientific Method, Prizewinning Physicist Says

In conversation, the 2019 Templeton Prize winner does not pull punches on the limits of science, the value of humility and the irrationality of nonbelief

By Lee Billings on March 20, 2019



Theoretical physicist Marcelo Gleiser, recipient of the 2019 Templeton Prize. Credit: Eli Burakian Dartmouth College

Marcelo Gleiser, a 60-year-old Brazil-born theoretical physicist at Dartmouth College and prolific science popularizer, has won this year's Templeton Prize. Valued at just under $1.5 million, the award from the John Templeton Foundation annually recognizes an individual "who has made an exceptional contribution to affirming life's spiritual dimension." Its past recipients include scientific luminaries such as Sir Martin Rees and Freeman Dyson, as well as religious or political leaders such as Mother Teresa, Desmond Tutu and the Dalai Lama.

Across his 35-year scientific career, Gleiser's research has covered a wide breadth of topics, ranging from the properties of the early universe to the behavior of fundamental particles and the origins of life. But in awarding him its most prestigious honor, the Templeton Foundation chiefly cited his status as a leading public intellectual revealing "the historical, philosophical and cultural links between science, the humanities and spirituality." He is also the first Latin American to receive the prize.

Scientific American spoke with Gleiser about the award, how he plans to advance his message of consilience, the need for humility in science, why humans are special, and the fundamental source of his curiosity as a physicist.

[An edited transcript of the interview follows.]

Scientific American: First off, congratulations! How did you feel when you heard the news?

Marcelo Gleiser: It was quite a shocker. I feel tremendously honored, very humbled and kind of nervous. It's a cocktail of emotions, to be honest. I put a lot of weight on the fact that I'm the first Latin American to get this. That, to me anyway, is important—and I'm feeling the weight on my shoulders now. I have my message, you know. The question now is how to get it across as efficiently and clearly as I can, now that I have a much bigger platform to do that from.

You've written and spoken eloquently about nature of reality and consciousness, the genesis of life, the possibility of life beyond Earth, the origin and fate of the universe, and more. How do all those disparate topics synergize into one, cohesive message for you?

To me, science is one way of connecting with the mystery of existence. And if you think of it that way, the mystery of existence is something that we have wondered about ever since people began asking questions about who we are and where we come from. So while those questions are now part of scientific research, they are much, much older than science. I'm not talking about the science of materials, or high-temperature superconductivity, which is awesome and super important, but that's not the kind of science I'm doing. I'm talking about science as part of a much grander and older sort of questioning about who we are in the big picture of the universe. To me, as a theoretical physicist and also someone who spends time out in the mountains, this sort of questioning offers a deeply spiritual connection with the world, through my mind and through my body. Einstein would have said the same thing, I think, with his cosmic religious feeling.

Right. So which aspect of your work do you think is most relevant to the Templeton Foundation's spiritual aims?

Probably my belief in humility. I believe we should take a much humbler approach to knowledge, in the sense that if you look carefully at the way science works, you'll see that yes, it is wonderful — magnificent! — but it has limits. And we have to understand and respect those limits. And by doing that, by understanding how science advances, science really becomes a deeply spiritual conversation with the mysterious, about all the things we don't know. So that's one answer to your question. And that has nothing to do with organized religion, obviously, but it does inform my position against atheism. I consider myself an agnostic.

Why are you against atheism?

I honestly think atheism is inconsistent with the scientific method. What I mean by that is, what is atheism? It's a statement, a categorical statement that expresses belief in nonbelief. "I don't believe even though I have no evidence for or against, simply I don't believe." Period. It's a declaration. But in science we don't really do declarations. We say, "Okay, you can have a hypothesis, you have to have some evidence against or for that." And so an agnostic would say, look, I have no evidence for God or any kind of god (What god, first of all? The Maori gods, or the Jewish or Christian or Muslim God? Which god is that?) But on the other hand, an agnostic would acknowledge no right to make a final statement about something he or she doesn't know about. "The absence of evidence is not evidence of absence," and all that. This positions me very much against all of the "New Atheist" guys—even though I want my message to be respectful of people's beliefs and reasoning, which might be community-based, or dignity-based, and so on. And I think obviously the Templeton Foundation likes all of this, because this is part of an emerging conversation. It's not just me; it's also my colleague the astrophysicist Adam Frank, and a bunch of others, talking more and more about the relation between science and spirituality.

So, a message of humility, open-mindedness and tolerance. Other than in discussions of God, where else do you see the most urgent need for this ethos?

You know, I'm a "Rare Earth" kind of guy. I think our situation may be rather special, on a planetary or even galactic scale. So when people talk about Copernicus and Copernicanism—the 'principle of mediocrity' that states we should expect to be average and typical, I say, "You know what? It's time to get beyond

that." When you look out there at the other planets (and the exoplanets that we can make some sense of), when you look at the history of life on Earth, you will realize this place called Earth is absolutely amazing. And maybe, yes, there are others out there, possibly—who knows, we certainly expect so—but right now what we know is that we have this world, and we are these amazing molecular machines capable of self-awareness, and all that makes us very special indeed. And we know for a fact that there will be no other humans in the universe; there may be some humanoids somewhere out there, but we are unique products of our single, small planet's long history.

The point is, to understand modern science within this framework is to put humanity back into kind of a moral center of the universe, in which we have the moral duty to preserve this planet and its life with everything that we've got, because we understand how rare this whole game is and that for all practical purposes we are alone. For now, anyways. We have to do this! This is a message that I hope will resonate with lots of people, because to me what we really need right now in this increasingly divisive world is a new unifying myth. I mean "myth" as a story that defines a culture. So, what is the myth that will define the culture of the 21st century? It has to be a myth of our species, not about any particular belief system or political party. How can we possibly do that? Well, we can do that using astronomy, using what we have learned from other worlds, to position ourselves and say, "Look, folks, this is not about tribal allegiance, this is about us as a species on a very specific planet that will go on with us—or without us." I think you know this message well.

I do. But let me play devil's advocate for a moment, only because earlier you referred to the value of humility in science. Some would say now is not the time to be humble, given the rising tide of active, open hostility to science and objectivity around the globe. How would you respond to that?

This is of course something people have already told me: "Are you really sure you want to be saying these things?" And my answer is yes, absolutely. There is a difference between "science" and what we can call "scientism," which is the notion that science can solve all problems. To a large extent, it is not science but rather how humanity has used science that has put us in our present difficulties. Because most people, in general, have no awareness of what science can and cannot do. So they misuse it, and they do not think about science in a more pluralistic way. So,

okay, you're going to develop a self-driving car? Good! But how will that car handle hard choices, like whether to prioritize the lives of its occupants or the lives of pedestrian bystanders? Is it going to just be the technologist from Google who decides? Let us hope not! You have to talk to philosophers, you have to talk to ethicists. And to not understand that, to say that science has all the answers, to me is just nonsense. We cannot presume that we are going to solve all the problems of the world using a strict scientific approach. It will not be the case, and it hasn't ever been the case, because the world is too complex, and science has methodological powers as well as methodological limitations.

And so, what do I say? I say be honest. There is a quote from the physicist Frank Oppenheimer that fits here: "The worst thing a son of a bitch can do is turn you into a son of a bitch." Which is profane but brilliant. I'm not going to lie about what science can and cannot do because politicians are misusing science and trying to politicize the scientific discourse. I'm going to be honest about the powers of science so that people can actually believe me for my honesty and transparency. If you don't want to be honest and transparent, you're just going to become a liar like everybody else. Which is why I get upset by misstatements, like when you have scientists—Stephen Hawking and Lawrence Krauss among them—claiming we have solved the problem of the origin of the universe, or that string theory is correct and that the final "theory of everything" is at hand. Such statements are bogus. So, I feel as if I am a guardian for the integrity of science right now; someone you can trust because this person is open and honest enough to admit that the scientific enterprise has limitations—which doesn't mean it's weak!

You mentioned string theory, and your skepticism about the notion of a final "theory of everything." Where does that skepticism come from?

It is impossible for science to obtain a true theory of everything. And the reason for that is epistemological. Basically, the way we acquire information about the world is through measurement. It's through instruments, right? And because of that, our

measurements and instruments are always going to tell us a lot of stuff, but they are going to leave stuff out. And we cannot possibly ever think that we could have a theory of everything, because we cannot ever think that we know everything that there is to know about the universe. This relates to a metaphor I developed that I used as the title of a book, *The Island of Knowledge*. Knowledge advances, yes? But it's surrounded by this ocean of the unknown. The paradox of knowledge is that as it expands and the boundary between the known and the unknown changes, you inevitably start to ask questions that you couldn't even ask before.

I don't want to discourage people from looking for unified explanations of nature because yes, we need that. A lot of physics is based on this drive to simplify and bring things together. But on the other hand, it is the blank statement that there could ever be a theory of everything that I think is fundamentally wrong from a philosophical perspective. This whole notion of finality and final ideas is, to me, just an attempt to turn science into a religious system, which is something I disagree with profoundly. So then how do you go ahead and justify doing research if you don't think you can get to the final answer? Well, because research is not about the final answer, it's about the process of discovery. It's what you find along the way that matters, and it is curiosity that moves the human spirit forward.

Speaking of curiosity… You once wrote, "Scientists, in a sense, are people who keep curiosity burning, trying to find answers to some of the questions they asked as children." As a child, was there a formative question you asked, or an experience you had, that made you into the scientist you are today? Are you still trying to answer it?

I'm still completely fascinated with how much science can tell about the origin and evolution of the universe. Modern cosmology and astrobiology have most of the questions I look for—the idea of the transition from nonlife, to life, to me, is absolutely fascinating. But to be honest with you, the formative experience was that I lost my mom. I was six years old, and that loss was absolutely devastating. It put me in contact with the notion of time from a very early age. And obviously religion was the thing that came immediately, because I'm Jewish, but I became very disillusioned with the Old Testament when I was a teenager, and then I found Einstein. That was when I realized, you can actually ask questions about the nature of time and space and nature itself using science. That just blew me away. And so I think it was a very early sense of loss that made me curious about existence. And if you are curious about existence, physics becomes a wonderful

portal, because it brings you close to the nature of the fundamental questions: space, time, origins. And I've been happy ever since.

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Credit: Nick Higgins

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