

Marilynne Robinson and Marcelo Gleiser — The Mystery We Are

Author: Marilynne Robinson

Krista Tippett, host: Novelist Marilynne Robinson and physicist Marcelo Gleiser are both passionate about the majesty of science — and they share a caution about what they call our modern “piety” towards science. They connect thrilling dots among the current discoveries about the cosmos and the new territory of understanding our own minds. We brought them together for a joyous, heady discussion of “the mystery we are.”

[music: “Seven League Boots” by Zoë Keating]

Marilynne Robinson: I tell my students, actually, that the mind continuously creates hypotheses, and when you’re writing fiction you’re doing something of the same kind. This is the best model I can create of what this reality would be.

Marcelo Gleiser: Do you feel when you write and you create characters, do you feel like they drive you in a certain way?

Ms. Robinson: Absolutely, and thank God when they do.

Mr. Gleiser: [laughs] Because, we do too. We’re not always in control. We’re just making sure all the minus signs and the plus signs match, you know.

Ms. Robinson: Wonderful.

Mr. Gleiser: But it really has a way that it wants to go, and when you find a solution or something that looks like a solution, you get emotionally moved.

Ms. Tippett: I’m Krista Tippett and this is *On Being*. I interviewed Marcelo Gleiser and Marilynne Robinson in 2012 at the National Constitution Center in Philadelphia. We were there at the invitation of the Princeton Center of Theological Inquiry and its director, Will Storrar.

[applause]

Ms. Tippett: Well, you know, I did not prepare an introduction to these two. I don’t think Marilynne Robinson needs any introduction. Can I say that you are one of the most requested names that comes through our email inbox of my program, year after year.

Ms. Robinson: Thank you.

Ms. Tippett: So finally here you are. The author of *Housekeeping*, *Gilead*, *Home*, and *Absence of Mind*, which is the book that we’re going to focus on especially tonight. And Marcelo Gleiser I have just gotten to know through — what is the name of your book? *A Tear...*?

Mr. Gleiser: *A Tear at the Edge of Creation*.

Ms. Tippett: *A Tear at the Edge of Creation*. A fabulous book, and I'm so happy to be introduced to this work and this writing. So Will gave the evening this lovely evocative title which I was thrilled to take on: "The Mystery We Are." And I want to start with that phrase — actually would like to start with you, Marcelo.

You grew up in Brazil. You've written that growing up in the tropics is a blissful portal into the natural world. I wonder if you could just say a little bit about how you trace back to your earliest life your sense of mystery as something thrilling and animating and also eventually linked to science.

Mr. Gleiser: I grew up in Rio in particular and right in front of the ocean. So it's impossible not to be amazed by the enormity of nature when you have that huge, beautiful Atlantic Ocean in front of you. And I was lucky that my grandparents had a house in the mountains about two hours from Rio, which we used to go to, which is part of what is called the Atlantic Forest, which is this incredibly lush, full of life, orchids and bromeliads exploding everywhere that enchanted Charles Darwin when he went down there, you know, on *The Beagle* and he talked about this power of nature.

So I think from a very early age I was just mystified by the beauty of this, and I wanted to understand how was that all possible, you know? And initially I looked for answers, so to speak, to religion. I grew up in a Jewish family, and I had a very formal Jewish education. And then I didn't feel satisfied with that. I wanted something different.

And then for my bar mitzvah, I actually got an autographed picture of Albert Einstein, [who was in Brazil in 1925](#), and he was hosted by our grandfather.

So I was blown away by that and I decide to know who is this man.

Ms. Tippett: He was visiting the Jewish community there, which is, I think, a part of Einstein's life that we don't hear as much about.

Mr. Gleiser: Yes. Exactly. So Einstein, after he became a superstar, he went down to South America to raise money for the Zionist cause. So the Jewish community is all kind of galvanized by this. And it turns out that his host in Rio was my grandfather, and they took a picture together, and they both autographed this. And that became my little altar, this man.

And so I would worship, and I would learn about him more and more. And I said, "I want do this." And one thing that he always wrote about was about the mystery of nature as the driving force behind science and scientific curiosity. And to me, that spoke to me directly: that science was not so much about finding all the answers but actually about courting with the mystery of the unknown. And I still feel that way.

Ms. Tippett: And Marilynne, you grew up in Idaho, which you describe also as a place of more austere but intense beauty. So I want to ask you the same question. How do you trace the roots of your sense of mystery also as something that came to be an animating force for you as a novelist and a writer?

Ms. Robinson: Well, my grandparents had a house in the mountains not terribly far from where I lived. It was in the western side of the Rocky Mountains, near Canada, and the proportion, or the disproportion, of nature on the one hand and human settlement on the other was really

striking. As a child, I grew up with the idea that human beings were a fairly trivial presence in the environment and that the mountains, you could hear them all the time. You could smell them. There was pine in the air or snow or whatever.

My grandparents had a house built actually by my great-grandparents, which was modern by the standards of the late 19th century and so it had a sleeping porch. You were supposed to sleep out there so that you wouldn't get tuberculosis. And I didn't, but in any case, it was amazing because at night you would hear the mountains. You would hear coyotes, and there was no other light. There was no sense of human presence aside from my grandparents' house.

And for me, because of the atmosphere of my own childhood, this became very, very deeply associated with theology for me, with religion, with the idea of the presence of God. And I think that this sort of fusion is characteristically American in a lot of ways. When I went to college in New England and read the Transcendentalists, I thought, "Exactly."

Ms. Tippett: So in your recent writing, each of you is driven from different directions by an observation that we have been working, thinking, acting on outdated models of reality, a limited conception of humanity and of the universe and even of science.

Marcelo, you talk about growing up, as you became interested in science, fascinated with this idea of unification, which was an idea of Einstein. And you talk about going to grad school, following this intellectual Holy Grail. But you don't quite see it that way anymore.

Mr. Gleiser: Right. So just to clarify, one of the grand goals of modern physics is to build a theory of everything, a T.O.E. Not a very beautiful name. But a theory of everything that would in principle explain all that we can observe in nature in terms of a single force, so to speak. And it's a very beautiful idea. It's very Platonist in its essence — that the essence of nature is mathematical. There is one big symmetry out there; and that symmetry is beautiful; and beauty is truth. And hence, there has to be that sort of idea in nature as well. And a lot of people, including Einstein — Einstein spent 20 years of his life looking for this theory of everything, this unifying theory. And of course he didn't find it.

I went to grad school trying to find it too. And after many years doing this and talking to lots of my colleagues, I came to the conclusion that that's impossible. That the theory of everything is an impossibility as a matter of principle. And the problem is this: that the way we understand the world — and interrupt me if I go on for too long.

Ms. Tippett: No, no. It's good. We're with you.

Mr. Gleiser: The way we understand the world is very much based on what we can see of the world, right? Science is based on measurements and observations. And the notion that we can actually come up and have a theory that explains everything assumes that we can know everything, right? That we can go out and measure everything there is to measure about nature and come up with this beautiful theory of everything. And since we cannot measure all there is to measure, since our tools have limitations, we are definitely limited in how much we can know of the world.

So you can even build a theory that would explain everything that we know now. But then two weeks from now, someone else will come and find something new that does not fit in your

theory. And that's not a theory of everything anymore because it doesn't include everything that can be included.

Ms. Tippett: And the implication of that is this sense that there would be some apprehension of reality of the universe, which would be perfect. It would be about stasis and perfection. But the way you're seeing it now is more about the universe being about change and transformation in our knowledge and that being the state of things.

Mr. Gleiser: Yes. That's true. So when you look out into the nature, everything is in transformation at all times. And we see this at the very small and we see this at the very large. When we look at the whole universe, it is expanding, it's growing, it's changing in time. And so, to me, I look at things much more as a state of flux, of becoming, of transformation, as something that has some static truth behind it. Let's put it that way. So the notion that we as humans could come up with a final answer to the mystery of nature is pushing things a little too far for our capabilities. Let's put it that way.

Ms. Tippett: And Marilynne, in *Absence of Mind*, you're saying many things, but to simplify, one thing you're saying is that modern people don't understand how thrilling and rich science is now and that culture has an antiquated view of science's place.

Ms. Robinson: I teach graduate students. I teach highly educated graduate students, and I find that their level of understanding of science is pretty abysmal. And I wonder what it is that makes a culture that really creates its fate and its future, basically, out of science is not telling people — the thing about science, contemporary science, is that it is as profound in its revelation certainly as Galileo ever was — or Copernicus.

The fact that we can know things that absolutely revolutionized previous models of the universe we inhabit. This amazing expansion into the microcosm, an expansion into the macrocosm, all these things that are happening are extremely beautiful and they are an enormous mirror of the competencies and the aspirations of the human mind. And I think, how are we letting people miss out on this? You know, just the esthetics of it.

Ms. Tippett: And the nub of some of the difficulty you describe as this far too simplistic choice that I think people, maybe Americans in particular, have felt that they had to make between an idea that the universe is created or the idea that it is all some kind of cosmic accident.

Ms. Robinson: As far as the scale of what we're learning to know, the psalmist has better intuitions about it than Richard Dawkins. But we're pious toward science. It does in fact criticize itself and overturn itself. It deserves that reputation. But this strange little world that we're presented as being scientific isn't; it's some sort of petrified conception that would have been at home in the 19th century.

Ms. Tippett: Do you have any ...

Mr. Gleiser: No. I actually — being a scientist, I actually agree with Marilynne. I think that once you adopt that there is only one way of understanding the complexity of things you're just emptying humanity of its value, of the plurality of visions. And so, yes, science is powerful. I love it. I do it. But there are other ways of knowing. And to say that there is only one way of understanding the mind, which is a topic that Marilynne talks so much about in her book, is just silly, to be honest. It's impoverishing the richness of human culture.

[music: "Fairy Dust" by Michael Wood]

Ms. Tippett: I'm Krista Tippett, and this is *On Being* — today in a public conversation with Marcelo Gleiser, a physicist at Dartmouth College and a poetic writer about science, together with novelist and essayist Marilynne Robinson.

Ms. Tippett: I also want to talk about this idea of creation and of myth. Because, Marcelo, you are not a religious person. Marilynne, you are certainly someone who — well, you preach and you teach the Old Testament and you are a big defender of John Calvin.

Ms. Robinson: You summed me up. [laughs]

Ms. Tippett: So, I mean, let's talk about creation and the word "myth." I think both of you have a real reverence for this kind of language and these ways of knowing, even though you might assess them differently.

Ms. Robinson: I think that if you look at, for example, the first creation narrative in the Old Testament, it's pretty amazing as an ancient account of creation. The fact that — it's perhaps overstating the case, but better than anything else, it does anticipate the modern cosmology, the creation of something out of nothing, which might be mythic language but very close. I mean, we can't do much better than that, I think.

It describes the emergence of the cosmos and of life in the world in stages. They don't exactly line up with ours but still, you know, that's an interesting insight.

Ms. Tippett: It's almost an evolutionary account.

Ms. Robinson: It's almost evolutionary.

Ms. Tippett: Yeah.

Ms. Robinson: Exactly. The second creation narrative, which is the source of a lot of trouble, actually is understood as a fable or a midrash or whatever you want to call it as early as the writer Josephus. And that's what I think it is properly to be understood as. But in any case, the idea of the abrupt emergence of something fantastically beautiful and intricate is descriptive. People can use the language that would call it myth, and I think that myth is the expression of the intuition of cosmology among ancient people.

They didn't have, of course, or perhaps would not have chosen to have the kind of language that we use for these kinds of things, but the general perception or intuition that you find in many ancient cultures — so far as I know, all of them — that there was a beginning. Even Hesiod describes the beginning. That's a profound intuition that did not burst upon modern scientific sensibilities until Irwin Hubble, until the 20th century. So you have people like Einstein and Bertrand Russell and so on who thought there was no reason to imagine that the universe had ever had to begin at all.

Ms. Tippett: Right, Bertrand Russell. You quote him: "The idea that things must have a beginning is really due to the poverty of our imagination."

Ms. Robinson: Exactly. Who knows what this means, that human beings had a profounder intuition than science could confirm into the modern period, but you have to respect it. There it

is.

Mr. Gleiser: Right. So I actually wrote a book way before this last one, called *The Dancing Universe: From Creation Myths to the Big Bang*. And what I do there is I look at all sorts of different creation myths from cultures around the world in different times in the ways they dealt with the question of creation, the question of the origin of the world, which to me is the most complicated question you can possibly ask. Right? So I call it “the question.” Right?

So then I go and I look at cosmology in the 20th century, before we had data. And what happened? All the models, the theories that cosmologists use to explain the universe reproduced these mythic ideas. So there was a universe that was cyclic, just like the dancing of Shiva. There were universe that, at least on paper, were created out of a moment in time, which was Friedmann came up with this model in 1922 before Hubble confirmed it. Right? And then there was an eternal universe as well.

So to me what’s really remarkable is two things. First, that all of this shows how we want to know. Right? I mean, the unity here between the two sides, if you want, is on the questioning on we need to know our origins.

Ms. Tippett: The two sides religion and science, you mean?

Mr. Gleiser: Yes. The mythic narratives and the scientific narratives, they’re both asking the same question: Where did everything come from? And then, of course, before data there was also the universality of human thought, if you want. Like, there were certain ways in which you can — there are only some ways in which you can answer this question and the scientists repeated them until, of course, data came. And only in the 1960s we were finally able to kind of discern that, you know, the Big Bang, meaning there was really a moment in time, seems to be the best way to describe what we see.

Ms. Tippett: To begin to speak of beginnings, to use that word in a scientific way.

When I was reading the two of you about this, it was the first time that I found myself wondering, why is it that we are so obsessed with the question of beginnings and origins? I mean, I wonder as a novelist if you have a thought about that.

Ms. Robinson: Think, frankly, that as modern people we struggle under certain prejudices against ourselves, that there are ways in which we have lost contact with, you know, the earlier intuitions that actually described themselves in culture and in literature and so on. But, uh, I think, you know, everyone wants to have a narrative of personal origins. Most of us want to have narratives of what you might sort of call tribal origins, you know: where did my grandparents come from and why and that sort of thing, you know.

I think that our bond with humankind is felt as a sort of very much enlarged family narrative of origins in that sense, you know. There’s some sort of a feeling that if you know where you came from you would know who you are. You would know what you should do. We lack definition of ourselves, which is an incredibly haunting feature of human life. And I think that often we, you know, if you look at these narratives like the epic of Gilgamesh or something like that, it says things about who the gods are, what the purpose of human life is, and so on. I think these are questions that people need, crave, and they take them right back to primal origins.

Ms. Tippett: Marilynne, you struggle a bit, I think, with science. You have a sense that even when people didn't have the science that we have now to think about the universe, we had this ancient intuition of our part in it. And is science at play in diminishing that? Is it cultural?

Ms. Robinson: I think that what we think of as science, or modern science, is something that puts into eclipse other forms of thinking that were also efficacious. Richard Feynman has written a — I read an essay of his in which he talks about identity. I mean, he says it's so amazing that I experience myself as myself over a year of time, that I retain memory and so on, when every atom in my brain would have been changed. But you can find the same statement almost syllable but syllable in John Locke who was writing in the 17th century, who says exactly the same thing. Every atom in my brain would have changed. And the question is how did John Locke know that? How is it that the Islamic philosophers that Maimonides was in conversation with were able to quantize time, essentially, as a way of solving the problem of time. How did they do that? How did they know?

I think that a great deal of what we do scientifically in the modern sense is actually the confirmation of the kinds of thinking that we either receive traditionally or would have arrived at by other means. And I think that — I mean, I'm very interested now in trying to see how people thought before they had this word "science" descend on the conversation in the form that it does now.

Mr. Gleiser: Right. I think it's impossible to separate us from nature. So when you go to the stories of creation and the relationship — the attempts at explanation that they are, they're really a pre-scientific mode of dealing with the unknown. Right? These people must have been completely baffled by existence, just like we are.

Ms. Tippett: Right. [*laughs*]

Mr. Gleiser: And we looked out and we see how is it possible that there are these regular cycles in nature like the sun coming back every day, the seasons. And then days of volcanic eruption, that there is a terrifying total eclipse of the sun. How do you have regular and irregular things going on in nature? Who is in control of that? And so, to me, those preliminary ways of making sense, of making meaning were just attempts at trying to have some level of control for things which were way beyond people's control. And science is just the new incarnation of the same sort of effort.

[*music: "Kapsburger" by Clogs*]

Ms. Tippett: This conversation was part of a symposium hosted by the Princeton Center of Theological Inquiry; it marked the centenary of the birth of Sir John Templeton. Full disclosure: The John Templeton Foundation is one of *On Being's* funding partners, and since this conversation, Marcelo Gleiser became a recipient of the Templeton Prize.

After a short break, more with Marcelo Gleiser and Marilynne Robinson. And you can find this show again in several of the libraries at onbeing.org: Creative Life, Science and Being, and Words Make Worlds. Find this and an abundance of more at onbeing.org.

[*music: "Kapsburger" by Clogs*]

Ms. Tippett: I'm Krista Tippett, and this is *On Being*. Today, "The Mystery We Are," a public

conversation with Marilynne Robinson and Marcelo Gleiser. Marilynne Robinson is an author of acclaimed novels. She's been talking about her fascination with the echoes she hears back and forth between modern science, religion, and the arts across the ages. Marcelo Gleiser is a Brazilian-born physicist who's captivated by the beauty and mystery at the heart of scientific discovery. He's also the author of poetic books about science, including *A Tear at the Edge of Creation*.

Ms. Tippett: There's a line that you wrote, Marcelo, that is the kind of statement that you're making as a physicist, but it's also just a statement about being human, right? "Symmetry may have its appeal, but it is inherently stale: Some kind of imbalance is behind every transformation." I mean, you could be talking about the cosmos and you could be talking about me yesterday, right?

Mr. Gleiser: Yeah. Absolutely.

Ms. Tippett: Yeah.

Mr. Gleiser: In this book I was having the very humble mission of trying to create a new aesthetic for physics. So basically saying that we need to look at the imperfection if you really want to get at things and give up the notion that there is this beautiful perfection behind everything. The modes of description that we use are fundamentally incomplete. And so let's embrace the imperfection, what's not perfect.

I always try and say do not try to make science into God. Because truly that's the idea, right? This notion that there is this oneness, perfection that you can describe through science is basically trying to create a scientific model for God.

Ms. Tippett: You know, Marcelo, you make this kind of provocative observation that with the search for the Unified Theory, science has set up a parallel to the God of the Gaps — which was the problem, especially in the 20th century, [this idea that God began where our scientific knowledge ran out](#). And you're saying that now the reality is that sort of [Unified Theory](#) begins where our scientific knowledge runs out.

Mr. Gleiser: Well, so the God of the Gaps is a notion that is old, right, in the sense that even Newton had to use it because when he was talking about how the planets went around the sun, the question was what gave the initial impulse for the planets to move around the sun. So he invoked God. God was a very, very important presence in the Newtonian universe. And so this whole idea of trying to put God where we don't understand the world is a terrible idea. I think it's theologically a very bad move, because science will advance, you know, and it will learn more and more about the world. And then God will be squeezed out of this gap and then have to go to another gap.

But the thing about where does this Unified Theory need come from, that's what always mystified me, even though I was a convert in the beginning, you know. And I think it really is a byproduct of having lived with monotheistic faiths for so long. So culturally it's very enticing for science to come up with this one explanation of everything. And I really trace the roots of that through monotheistic faith.

Ms. Tippett: I wonder what questions you might have of each other.

Mr. Gleiser: Well, let's see. So, Marilynne, you speak so eloquently of the need for diversity in understanding things. Maybe you can talk to us a little bit about that and why this kind of one-way one-track of science is misleading us.

Ms. Robinson: Well, I'm always — my first criticism of that version of science is that I think that it does not at all describe the best that science does. First of all, because science is — its genius is self-criticism. When you find out that the universe is accelerating and accelerating in its rate of acceleration and so on, this is not supposed to be true and the moment that they find out that all major assumptions have been overthrown, there's rejoicing in the scientific community, you know.

And that's a lovely, you know, that is the authority of science for me. The fact that we cannot be articulate about ourselves — and I think that's deeply true. I think that the arts are our effort to articulate the experience of self and mind and so on that is inaccessible to scientific description — that that deep yearning that is as ancient as the desire to know where we came from and the rest of it has been disallowed as the legitimate part of the human record and the human conversation. And this seems to me to be completely arbitrary. And along with, of course, other forms of the profound self-exploration of human inwardness is the rejection of religion, which is also put out of account. There's nothing really more universal, I think, in human cultures than the impulse to religion.

If you were looking at it dispassionately, the question of what people are, you would have to take this very enormous and elaborate self-description seriously as a datum, so to speak. And I think that if people have interests that are scientific but don't tend toward addressing questions of that kind, fine. They've distinguished themselves. It's beautiful. But they can't act as if they have addressed those questions when in fact everything that they do is actually relevant to another set of issues.

Ms. Tippett: I think you're actually saying that to dismiss that very ancient and pervasive aspect of human life and human culture is irrational on some level.

Ms. Robinson: Yes

Mr. Gleiser: Yeah. And to think of science as separate from spirituality to me is a big mistake. There is nothing that says that science should be dispassionate about the spirit or the life of the spirit. And to me it's quite the opposite. It's exactly because I feel very spiritually connected with nature that I am a scientist. And to write equations on a blackboard and to come up with models about how nature works is, in a sense, a form of worship of that spirituality. And I feel that very concretely all the time.

Ms. Tippett: Do you have a question of Marcelo?

Ms. Robinson: Oh, my. One thing that I find when I'm reading, you know, scientists that write in a popular way, writing these issues and that frankly I've found a couple of times in your book, is a tendency to use the word "explain" when I would say the appropriate word is "describe." If they figure out the fine points of photosynthesis, maybe we'll say, well, it's a quantum phenomenon or something like that. That's a description. It's not an explanation. And perhaps there are things that are not — don't make themselves available to explanation but that does not mean that description stands in the place of explanation.

And if somebody says why does a clock tell time, you can describe the mechanism of the particular clock or you can say people arrived at a convenient definition of one day, divided it into arbitrary segments, and made a mechanism that would measure those segments because culture required timekeeping with that degree of precision. Now, that's not a complete explanation, but it is explanatory whereas the other one is only descriptive.

And I think that's a very important distinction that is not made because very often when people look at religious accounts of things, people looking at them from the outside, they say, no, that's not an explanation. Actually, the explanation is that it was beneficial to the leopards' existence that it blended into a shadowy landscape — hence, spots. You know what I mean? This is descriptive. It is not explanatory.

Mr. Gleiser: I'm fine with that.

[laughter]

Mr. Gleiser: I don't think I have any claims there. I would say that we are just trying to make sense of physical reality in the best way we can, and perhaps what you are implicitly referring to is the lack of humility that sometimes comes with the scientific kind of rhetoric — that there is sort of this, like, "this is how it is" kind of thing. And the ones that probably bother you the most are the ones that get the public voice and that do make rhetorical statements about things such as now science can understand the origin of the universe, which is absolutely not true, formally not true. But the statement comes out in the media and in books by very famous people all the time. And that bothers me as much as it bothers you.

Ms. Tippett: Somehow it's in the nature of media and our public dialogue that it's not the humblest voices of religion or science who make their way in front — to microphones and cameras.

Ms. Robinson: That is so true.

Mr. Gleiser: That's right.

Ms. Tippett: But here you are in front of a microphone.

[laughter]

[music: "Peacock Tail" by Boards of Canada]

Ms. Tippett: I'm Krista Tippett, and this is *On Being*. Today, "The Mystery We Are," a public discussion with theoretical physicist Marcelo Gleiser and novelist Marilynne Robinson.

Ms. Tippett: Here's a line of Reverend Ames in *Gilead*: "This is an interesting planet. It deserves all the attention you can give it."

Just before we finish, let's talk a little bit about mind, which takes us a little bit outside the realm of physics, but very much into your writing, Marilynne. And somehow, the primacy, the centrality of our minds, the power of them, even in all of this discerning of distant galaxies.

Ms. Robinson: I think one of the things that is fascinating is that we don't know who we are. Human beings in acting out history describe themselves, and every new epic is a new

description of what human beings are. Every life is a new description of what human beings are. Every work of science, every object of art is new information. And it is inconceivable at this point that we could say anything final about what the human mind is, because it is demonstrating, you know, in beautiful ways and terrifying ways, that it will surprise us over and over and over again. You know?

And if I read something that seems to me — I mean, we have mind in two senses, or of several senses, but one of them is the the individual, striving mind: I want to come up to the mark. I want to follow my passion. I want to let myself think about something that seems beautiful to me. There's that mind. And then there is the larger, collective mind that somehow or other seems to sort of magnify impulses and so on that occur among us individually.

When you think how even the most brilliant people living in the first century would see how we know and what we know now and so on — which is basically a pure elaboration of what they'd already started — nevertheless, they would be completely astonished. They would say that human beings could've done such a thing. We know things about our minds because we have seen them reaching and reaching and unfolding in this uncanny way that they do.

And I just think that undervaluing mind, it distorts what we're capable of. You know? I don't know. That's what I think. I think the mind is fantastically competent and beautiful and in a very large degree unexplored.

Ms. Tippett: Marcelo, is this new frontier of mind and consciousness, is it challenging for physics? Or where does it fit into your way of seeing the world?

Mr. Gleiser: It's very challenging, because the way physics traditionally has worked is through this reductionistic method, right? You look at a complicated problem, you break it down into small parts, you understand how these small parts work and then try to make sense of the whole. And this extrapolation works beautifully when you talk about stars and galaxies, but it really fails miserably when you're talking about the mind or the brain. Right?

So as I said earlier on, you can't understand the brain by understanding how a neuron works. And so it poses a tremendous difficulty for physics because we can't model the brain. Right? And physicists, that's what we do for a living. We make models. We test our hypothesis. And we need a different kind of explanatory, descriptive tool because the way we have dealt with things just won't work for the brain.

So what would that be now, right? So there is this whole new notion that comes from complexity theory that the mind is an emergent phenomenon that we can't quite explain that has to do with the concatenation of many different groups of neurons at the same time. So the interesting thing about that is that, if that is true, then new laws will emerge at different levels of complexity. And you can't go from one level to the other level directly. You really need a completely different kind of explanation. And we're not there yet, but it's just an alternative way of thinking about how the brain works. And to me, given the complexity, even if we go there and we gain some level of understanding above what we know now, it's always going to be incomplete, just like Marilynne said.

Ms. Tippett: But I think that part is exciting for you, the fact that it will be incomplete, the fact that there will always be more to learn.

Mr. Gleiser: Yes. When I was saying this, I was thinking can we ever build a machine that thinks? That's really the question, right? Because if you could build a clock that thinks, then you'd really say, yes, we mechanized the brain and we understand exactly how it works and what are the rules that make it all make sense. But I am a skeptic when it comes to that. I really am, at least for the foreseeable future. I don't see how, even increasing the power of computers, we'll be able to do that.

What we will be able to do is what the internet is already doing, which is creating an enormous databank of information that will almost look intelligent, but you will always be asking the questions. It's the asking of the question that is the mystery, not so much how you find the ways to answer it.

Ms. Tippett: I think that's a wonderful thought, that the asking of the questions is the mystery. I occurred to me when I was reading both of you and thinking about this conversation how much a novelist and a scientist, a physicist, have in common as creators and discoverers.

Ms. Robinson: I'm flattered.

Mr. Gleiser: So am I. I mean, novelists create universes, right? Talk about a multiverse. You know, the mind of a novelist is a huge multiverse, because they are creating all these different dynamics and people that don't exist.

So in a sense, you know, you are playing with inventing lives and minds and stories. So you are amplifying the mind every time you do such a thing.

Ms. Robinson: Yes. There's that problem of plausibility — making what even appears to be a sort of working model of a human personality is such a delicate thing. *[laughs]*

Mr. Gleiser: For sure. How is it that you say? That fiction is — it's telling lies but want to make sure they sound like truth.

Ms. Robinson: Exactly.

Mr. Gleiser: Right? And we're trying to do something similar. We're trying to make models, which are never the whole truth of nature. That is a fundamental point. Every model is a lie, but some models explain more than others.

Ms. Robinson: I tell my students, actually, that the mind continuously creates hypotheses. You know, tomorrow is a hypothesis. You have some theory of the general shape of tomorrow, which could be completely false, completely inaccurate, but you have to have the hypothesis in order to be sane and act rationally in the world and so on. And when you're writing fiction, you're doing something of the same kind. Or when you're making a scientific theory, you're doing something of the same kind: This is the best model I can create of what this reality would be.

And in fiction, unless the fiction fails, the hypothesis does not get exploded but at the same time you always understand its hypothetical nature, whereas in science the hypothesis is floated and retrieves what it can and explodes if it needs to.

Mr. Gleiser: Do you feel when you write and you create characters, do you feel like they drive you in a certain way?

Ms. Robinson: Absolutely. And thank God when they do.

[laughter]

Mr. Gleiser: Because we do too. When you're working on a technical problem, it seems to have a way to go that we are not always in control. We're just making sure all the minus signs and the plus signs match.

Ms. Robinson: Wonderful.

Mr. Gleiser: You know? But it really has a way that it wants to go, which is kind of beyond what we have total control of.

Ms. Robinson: That's fascinating. It is.

Mr. Gleiser: And when you find the solution or something that looks like a solution, you get emotionally moved to an amazing extent, especially when it's a surprising thing. You know, it really is a spiritual emotion. Like, I've had this a few times — not many. I actually probably had it several times but I just had a couple. But when I have this, it really is something transcendent.

Ms. Robinson: Do you think that, for example, teleology might be an inadequate way of articulating what you're talking about? Teleology is sort of forbidden, but you can feel the shape of something pulling you toward something that you don't intend, and it's as if the shape is somehow intrinsic and the conclusion is somehow necessary?

Mr. Gleiser: That's funny because you phrased it in the negative. But that's very smart. Maybe? I am always afraid of teleology. Teleology has so many different traps. And so the question is always if it's teleology who's in control? And I don't know.

Ms. Robinson: Exactly.

Mr. Gleiser: You know, who are your characters there driving you?

Ms. Robinson: Yeah. But you don't know who's in control and you have the feeling that there is some sort of intrinsic control emerging. In the sense, for example, that if you're creating a character and you ask him to do the wrong thing, use the wrong language, or leave when the conversation isn't over, he refuses. And I'm sure that when you're doing something like that you just, you take a wrong turn and it tells you it's a wrong turn in some way.

Mr. Gleiser: Absolutely. You know you're going wrong. You completely do. And that's what's hard about science and about fiction writing is that sometimes you're forced to go where you don't want to go because otherwise you are violating a certain law. And it's just horrifying, right, because you really want to prove something, but you can't, because it's wrong. And you really believe in it, but that's not good enough, right? And that's sort of the ruthless aspect of science in a sense that — I don't know, maybe as fiction you have a little more freedom than we do in that sense.

Ms. Robinson: Or another kind.

Ms. Tippett: So I think in a very remarkable way we've ended up back at the mystery of creation and even wandered into free will, but we don't have time to go there this evening. And

so I want to thank Marcelo Gleiser and Marilynne Robinson and Templeton Foundation and Center of Theological Inquiry for hosting this. It was lovely to be here.

[applause]

[music: "Frontiers" by Floratone]

Ms. Tippett: Marcelo Gleiser is Appleton Professor of Natural Philosophy and Professor of Physics and Astronomy at Dartmouth College. He's the author of *The Dancing Universe*, *A Tear at the Edge of Creation*, and, most recently, *The Simple Beauty of the Unexpected: A Natural Philosopher's Quest for Trout and the Meaning of Everything*. He was awarded the 2019 Templeton Prize.

Marilynne Robinson is a professor emeritus of the University of Iowa Writers' Workshop. She's the author of several novels — including *Housekeeping*, *Home*, and *Gilead*, which won the Pulitzer Prize for fiction. Her works of nonfiction include *Absence of Mind* and, most recently, *What Are We Doing Here?*

Staff: The On Being Project is Chris Heagle, Lily Percy, Marie Sambilay, Erinn Farrell, Laurén Dørdal, Tony Liu, Erin Colasacco, Kristin Lin, Profit Idowu, Eddie Gonzalez, Lilian Vo, Lucas Johnson, Damon Lee, Suzette Burley, Zack Rose, Serri Graslie, Nicole Finn, Colleen Scheck, and Christiane Wartell.

Ms. Tippett: The On Being Project is located on Dakota Land. Our lovely theme music is provided and composed by Zoë Keating. And the last voice that you hear singing at the end of our show is Cameron Kinghorn.

[music: "Song for Nikki" by Bonobo-trio]

On Being is an independent production of The On Being Project. It is distributed to public radio stations by PRX. I created this show at American Public Media.

Our funding partners include:

The John Templeton Foundation. Harnessing the power of the sciences to explore the deepest and most perplexing questions facing human kind. Learn about cutting-edge research on the science of generosity, gratitude, and purpose at templeton.org/discoveries."

The Fetzer Institute, helping to build the spiritual foundation for a loving world. Find them at fetzer.org.

Kalliopeia Foundation. Dedicated to reconnecting ecology, culture, and spirituality. Supporting organizations and initiatives that uphold a sacred relationship with life on Earth. Learn more at kalliopeia.org.

Humanity United, advancing human dignity at home and around the world. Find out more at humanityunited.org, part of the Omidyar Group.

The Osprey Foundation — a catalyst for empowered, healthy, and fulfilled lives.

And the Lilly Endowment, an Indianapolis-based, private family foundation dedicated to its

founders' interests in religion, community development, and education.