**Ashna**
Hi everyone, I am Ashna your sometimes co-host and fellow guide.

**Dwayne**
With this show, we are going to fight for a more rational world, mostly by looking through the lens of the philosophy of science. We will raise awareness of issues within the philosophy of science and present alternative and *rational* approaches.

**Ashna**
Yes, and today we are going to tell you a little bit about the show's agenda and we will provide a brief overview of some of the irrationalities present in the philosophy of science.

**Dwayne**
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Alright, let's get started.

This show is about a *rational, objective* approach to the philosophy of science. If you are interested in the philosophy of science, then this show is for you.

As you may be aware, it is said that Plato carved "Let none ignorant of geometry enter here". Well, we have not carved "Let none ignorant of philosophy" upon the entrance to these halls.

This is *not* Plato's Academy and you do not need to know any philosophy or geometry to walk these halls. However, you might learn a little about the philosophical problems in science.

**Ashna**
Indeed. Our approach to philosophy is much closer to that of Aristotle or Ayn Rand. We believe in an *objective, rational* approach to science and that is what you are going to get.

If you keep listening, this is not the last you will hear of our spiritual and philosophical enemy Plato. And his many disciples that have followed him through the last few thousand years. In fact, We will be hearing from a few of these disciples later in this episode.

We will be discussing the philosophy of science, focusing heavily on physics and mathematics. More specifically, the many irrationalities that are found within the modern philosophy of science, especially within the philosophy of physics. We will spend a lot of time raising awareness of these issues and then providing alternative ideas.

What are some of the topics we have in store for our listeners?

**Dwayne**
The is the Big Bang, the impossibility of strong AI, logical fallacies, why string theory is not even wrong, a fake interview with Niels Bohr and many others.

We will be talking about a lot of things from physics that bother us, and we think should bother *any* rational person. Now, we have issues with the standard interpretations of things like quantum theory, relativity (special and general) and other parts of modern physics, this should not be taken as a dismissal of these fields.

We are questioning the standard interpretation of quantum physics, *not* dismissing the *entire field.* We are not denying that GR and quantum physics are useful and that without them we would not have things like GPS and integrated circuits.

**Ashna**
Well, the mathematics of quantum theory and relativity is good stuff, right? I mean, all that checks out, as established by a lot of different experiments. As well as certain other key aspects of their theoretical structure.

**Dwayne**
Yeah, what we question is the way these theories are normally interpreted.

For instance, it is widely believed that quantum mechanics shows that particles exist in a superposition of indefinite states until observed. It is believed that GR shows that space is curved. But are these things true? We do not believe so. However, one could interpret GR and quantum physics to suggest such a thing.

It is these kinds of interpretations which we take issue with when it comes to many of the things we will be discussing within modern physics.

Let's go over some examples of the kinds of issues we have within modern physics today.  This should provide an insight into the kinds of issues we have in mind.

**Ashna**
Well, there is string theory. It arose as an attempt to unify gravity and quantum mechanics and other theories within modern physics. Various people have been developing it for around thirty years, yet none of them have gotten any closer to providing any evidence that string theory might be a viable area of research.

**Dwayne**
Yeah, the claims made by string theory have become so bizarre that some physicists think that it is just a little *too* bizarre.

String theorists spend a lot of time arguing about whether the universe has nine, ten, eleven or some other number of dimensions. About how there may be 10^500 different flavors of string theory and how obviously difficult that makes things. And other really bizarre things.

Yet, even some physicists are starting to think that there is little hope that string theory will *ever* be able to be confirmed. Which does not bother a lot of experts, who seem content to tell their colleagues that experimental verification does not matter and that people need to shut up and calculate. As though a physics theory does not *need* experimental verification.

**Ashna**
What about all this arbitrary talk of parallel universes? Or, the talk that the universe is made up of mathematics. Or that we might be living in a computer simulation. Even that the universe might observe itself. All these claims have been made by mathematicians, physicists or philosophers.

What about special relativity? It asserts that properties of things change relative to the observer. Or, quantum theory which asserts subatomic particles can exist in mutually exclusive states at the same time and that therefore under the right conditions, cats can be alive and dead at the same time?

**Dwayne**
As much as we all love Schrodinger's cat memes… all these things are grossly irrational and yet are held up as scientifically validated and or

proven and to be accepted as part of *science*. We shall be discussing *all* of these and many more.

Let us provide you a few quotes which help to give you a sense of the sorts of issues that exist within the philosophy of science these days.

Here we go. Note that emphasis has been added for clarity:

**Dwayne**
"Reality is merely an illusion, albeit a very persistent one." -- Albert Einstein

**Ashna**
"I regard consciousness as fundamental. I regard matter as derivative from consciousness. I cannot get behind consciousness. Everything that I talk about, everything that I regard as existing, postulates consciousness." -- Max Planck; The Observer, 1931

**Dwayne**
“After decades of closely studying quantum mechanics, and after having accumulated a wealth of data confirming its probabilistic predictions, no one has been able to explain why only one of the many possible outcomes in any given situation actually happens." -- Brian Greene; The Hidden Reality

**Ashna**
"As far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality." -- Albert Einstein

**Dwayne**
"Isolated material particles are abstractions, their properties being definable and observable only through their interaction with other systems" -- Niels Bohr; Atomic Physics and the Description of Nature (1934)

**Ashna**
"I think that modern physics has definitely decided in favor of Plato. In fact, the smallest units of matter are not physical objects in the ordinary sense; they are forms, ideas which can be expressed unambiguously only in mathematical language." -- Werner Heisenberg; The New York Times Book Review, 8 March 1992

**Dwayne**
"Einstein, in the special theory of relativity, proved that different observers, in different states of motion, see different realities. " -- Leonard Susskind ;

**Ashna**
"Nothing is real unless it is observed." -- John Gribbin; In Search of Schrödinger's Cat: Quantum Physics and Reality, 1984

**Dwayne:**
"Things are the way they are in our universe because if they weren't, I wouldn't be here to notice." -- Brian Greene; The Elegant Universe.

**Dwayne**
These quotes amount to an attack on the senses, an attack on the ability to know reality, an attack on objectivity, an attack on reason and so forth. But, once you abandon reason, you have abandoned *science*. So, what these quotes amount to is an attack on science.

**Ashna:**
What about the Standard Model of physics, though? That seemed like it was a pretty big deal and seems to have gone a long way towards explaining the fundamental forces of nature and classifying the elementary particles.

**Dwayne**
Yeah, OK, but that was about forty years ago at this point. And what have they done since then? They have not made any kind of progress like that since then and fundamental physics has come to somewhat of a standstill. This is something which many physicists admit.

**Ashna**
But many consider that string theory will one day qualify.

**Dwayne**
String theory is a bizarre hodgepodge of contradictory ideas which *nobody* has been able to make work despite about thirty years of intense theorizing. We will cover string theory in later episodes, but for now, it suffices to say that we do not think string theory qualifies as a promising area of physics research. In fact, it is indicative of the entirely irrational way many physicists approach physics.

**Ashna**
Have they made *any* progress?

**Dwayne**
Oh, of course, they have. But, there has not been anything big that furthers the understandings of the fundamentals of physics. Not for a long time.

**Ashna**
Why do people believe this kind of thing then?

**Dwayne**
Because most people, including most modern physicists, have, explicitly or implicitly, adopted an irrational philosophy that leads them to accept that reality as it really it is not knowable, which makes it hard to know or develop rational physics.

They incorrectly believe that we can only know reality as it appears to us, distorted by the lenses of our human senses. This is what it means when it is said that we can only know "appearances", that we can only know reality as it appears to us, not as it really is.

There is an attitude of "science is what scientists say it is" that is very prevalent in modern culture. It is considered irrational to question anything a scientist says, no matter how clearly irrational what is said might be.

**Ashna**
Indeed, it is taken for a fact that scientists do science and what they say is therefore almost certainly rational and true, no matter how bizarre it might sound…

**Dwayne**
It is unfortunate that they think that, however, it is not very surprising. The sciences tend to be advanced subjects which many non-specialists only have a very basic grasp of. Most people do not and should not be expected to have a deep understanding of the sciences and therefore rely on the word of scientists when it comes to many scientific issues, which is also fair enough.

However, there is the attitude that just anything scientists say should be accepted as science. But, it is not true that just anything a scientist claims should be accepted to be true.

While it is true that many non-experts are in a position where they should generally trust the word of any credible scientific expert, this does not mean that just anything these experts might say should be accepted.

Not if what they say flies in the face of proper philosophical ideas. Not if what they say clearly contradicts the rules of logic or metaphysics or are just clearly wrong.

It is true that philosophy is not able to form a position on particular, scientific issues (outside of philosophy). It does not have the tools, such as experimentation and math required to engage in the physical sciences.

But, it does have a certain veto power when it comes to the physical sciences. Any claim made within the realms of physical sciences (or any other field of study) which contradicts rational metaphysics and epistemology must be rejected. No matter how much evidence any scientist claims to have or how well reasoned he claims that his argument is.

**Ashna**
"If your metaphysics and epistemology are rational, then it should not conflict with evidence or reasoning. If it does, then you should probably reconsider your evidence or reasoning..

**Dwayne**
Right, therefore, to some extent, anyone with even a basic understanding of rational philosophical ideas can reject certain things scientific experts might claim. Even if they lack expertise in the subject. If scientists make claims which contradict rational philosophy, then those claims should be rejected, regardless of any alleged scientific evidence. People do not do this. They accept almost anything scientists claim these days. Partially because they are used to accepting what experts in the field say, partially because they assume people with authority in a subject are almost never wrong.

But, also partially because they do not understand rational philosophy and do not know that philosophy can be used to reject many of the claims that are part of modern physics.

Partially because they are used to scientists making these kinds of claims, claims which often agree with the philosophy most people have implicitly accepted.

Many scientists have implicitly adopted the view that they cannot know what reality is really like, so whatever they believe is the best guess anyone can make. They do not believe that they can fully understand what reality is, but they have to come up with something.

And they believe that what they think is true. So does much of the general population. Because those people are scientists and science is about rationality and the truth.

**Ashna**
Well if science is about rationality and truth, then those who practice science must be advocating the truth. One could wish this statement could be taken at face value. Alas...

**Dwayne**
Only if the scientists know what qualifies as the truth and how to discover it. Which requires a good grasp of rational philosophy, which most in the field do not have.

It is therefore not valid to assume that just anything these people say is true. Just because they purport to be doing science does not mean that they are in fact doing so. Science is not whatever scientists might happen to be doing. It is a process which scientists are supposed to use to discover the truth.

If they do so, then it is rational to assume that most of what they claim is likely to be credible. If not, then it is rational to question the validity of anything they say which is not based on the scientific method.

Yes, scientists today often claim that they are operating under the scientific method, but this is often not the case. The scientific method requires a grasp of rational philosophy and how to design and properly interpret experiments. Many today do not know how to design or properly interpret experiments.

**Ashna**
I should add that computer models and mathematical deductions do not replace the scientific method, which requires experimentation.

**Dwayne**
Yeah, so science is not what scientists say. Science is the process of discovering things using certain methods. Not of getting a Ph.D. and saying that whatever you say is science and that it is irrational to question you.

**Ashna**
Let’s not go too much further into that today. We simply wish to give a very brief overview of some of the issues. The reasons these issues exist will be explained in some depth in later episodes.

Physicists often deny that philosophy has much relevance to physics, mathematics or whichever field of science, but that is just not the case. As we shall see, philosophy is *vital* to doing *any* kind of science and indeed you cannot do science without *some* kind of philosophy.

Yet, philosophy is widely dismissed as either useless or secondary to physics or other areas of science. Despite the fact that philosophy informs you of the basic nature of reality, how to think and is required to do any science at all.

It would take more time than we have remaining in this episode to make a full argument for why scientists and everyone else needs philosophy. This will be the topic of an upcoming lecture. For now, we refer you to this excellent lecture by Ayn Rand titled, “Philosophy: Who Needs It”. You can find the link in the episode description.

To quote the philosopher Ayn Rand:

“Philosophy is the science that studies the fundamental aspects of the nature of existence. The task of philosophy is to provide man with a comprehensive view of life. This view serves as a base, a frame of reference, for all his actions, mental or physical, psychological or existential.

This view tells him the nature of the universe with which he has to deal (metaphysics); the means by which he is to deal with it, i.e., the means of acquiring knowledge (epistemology); the standards by which he is to choose his goals and values, in regard to his own life and character (ethics)—and in regard to society (politics); the means of concretizing this view is given to him by esthetics”

Of course here on this show, we focus on the metaphysics and also epistemology.

In short, this quote reminds us that without philosophy, a scientist would have no idea of the nature of reality. He would have no idea what knowledge is or how to acquire it. No understanding of any of the tools scientists use to study reality and make conclusions or even how to reach any kind of conclusions.

He would have no way to know how to learn *anything*. Not to mention all the other questions which would bombard him. Which without philosophy he would have no means of answering.

And, as we shall see, the philosophies of many scientists have shaped the results they get in science and the theories they create.

**Dwayne**
Alright, we are just about done for now. Before we wrap up though, a few more things.

If you have not done so already, please check out the website on metaphysicsofphysics.com.

We are always seeking guest stars to interview or present lectures! So, if you have any suggestions along such lines, please email us and we will consider your suggestion. We have a couple of these coming up, more details on this soon.

You are welcome to send in questions about any of the things talked about in this episode or about irrational stuff in physics or the philosophy of science in general. Send them in to questions@metaphysicsofphysics.com.

What do we have for the next episode?

**Ashna**
Ah yes, we will be talking about some of the typical anti-reason ideas held by Stephen Hawking.  This gives a decent overview of the some of the issues in modern physics today.

**Dwayne**
Great, so thanks for listening! Please tune in for the next episode and start thinking of some questions! Until then, stay rational!

**Ashna**
Stay rational!