>> From WXXI News, it's 1370 Connection.

[Background Music]

>> I'm Bob Smith. Science and faith at war. Are they so to speak partners in helping us to understand our world or are they at realms for they have little or nothing to do with each other apart from us? Well, prominent scholars from Darwin to Andrew Dickson White to Stephen Jay Gould have been contemplating all of these for more than a century. Astrophysicist, Adam Frank, of the University of Rochester has been thinking about this issue for awhile with himself. He became the latest prominent scholar to win a wide audience of readers for his take with his book "The Constant Fire." He is going to be speaking at 8 this evening as part of the Caroline Werner Gannett Lecture Series at RIT's Carlson Auditorium and joins me in studio right now to talk about science, metaphysics, and our faith in both. Adam good to have you with us, welcome back.

>> Great to be here.

>> I wanna begin at the beginning if I can. Has there been tension between those who explain the physical universe and explore it and look at it as the focus of all human interest in attention, and those who explore the metaphysical? Has this been going on ever since the beginning of science?

>> Yes, certainly it has been going on since the beginning of modern science, the form of science which took--which began to gel around 400 years ago with Copernicus and Galileo and Kepler. And there wasn't always necessarily a war going on between this because certainly the founders, many of the founders of science consider themselves to be deeply religious or spiritual people. And what--they saw their own activity as being honoring what they considered also to be sacred. The warfare part--so there may have been disagreement. So, you know, certainly Kepler and Galileo may have been at odds with the religious authorities at the time. But within that, those religious institutions some were in favor of things like say the heliocentric model, the idea that the sun was at the center of the solar system and others were opposed. Warfare as a model really emerged only in the last hundred years or so and that in for a very specific both political and historical reasons. So there's always been tension but warfare is a relatively new contract.

>> Does that date back to Andrew Dickson White's book or around the same time as?

>> Yeah. Pretty much the idea of warfare came from two specific camps, one in science and one in religion. So around the turn of the century there was a book written by Andrew Dickson White who was the first president of Cornell University called war--if I'm doing the title correct, "Warfare between Science and Christendom." And in it, he laid out an argument for how there had essentially been this warfare, this battle from the beginning of science. And that book was--he was such an authoritative scholar that really many people, you know, were not likely to question that book. And as it turns out the book has a number of errors and misquotes. There's a famous quote from Calvin where Calvin says, who--speaking about Copernicus as you know, "who--what fool would challenge the authority of God on this point." And I use that quote in my astronomy class all the time and it's only in doing this research that I found

out that that quote can be traced to Dickson White and no further. So you know, Calvin never said that essentially. So from the science side that is where you can trace the beginning of the warfare metaphor to that book.

>> And then from this point on, I guess there are people on the other side of the equation that White was kind of secular humanist scholar and clearly sided with science. But there are folks on the other side of the divide who have taken up the culture, they're happy to go to war as well.

>> Yeah. I think, you know, the reasons why science--where the--how the warfare model emerged from the science side was also--was much in part because of the professionalization of science that was happening around that time, 1850s to 1900. The metaphor of the pastor scientist was quite common. There are many--you know, in the beginning, natural scientists and pastor especially in England were often the same people. And as science became professionalized that it needed the jobs needed to be at the universities, you need the credentials, there needed to be sort of a pulling apart from the scientific side and this metaphor of warfare from the science side can be seen as in some sense there was an aspect, an aspect of it that was a political battle over jobs. On the religious side though, however, clearly the fundamentalist camps in Christianity were the ones who were quite happy to turn this into a warfare.

>> And not every church went along with this.

>> Oh, not at all.

>> A lot of mainstream religions were quite happy to coexist with science and say "hey, you've got your realm. We've go tours. We don't have to collide." But a lot didn't. What differentiates the churches that didn't from the churches that did?

>> Well, you know, the word "fundamentalism" actually comes from a set of volumes that were produced over a period of about 10, 20 years called the fundamentals. And these books were written by--these are intended to be, you know, very strident literalist camps within the United States in terms of their interpretation of scripture, and these books were meant to be a retort for pastor to--in dealing with what they saw as secular liberal society. So it was really a very, fairly narrow branch of American Christianity that took this position particularly against evolution, whereas many other camps, you know, including eventually, obviously, the Catholic church that were willing to try and make their piece between evolution and scripture.

>> You know, or basically do what Pope John Paul II said and say "who are we to question God" in this regard--

>> In which way God might decide to build.

>> Exactly.

>> Yeah, right, to build the world.

>> Or to let it be built.

>> Right, right. Well you know, the interesting thing, when you look at the history of science and religion often, it's religion having to respond to the

advances of science and try to somehow accommodate the descriptions of reality that science is advancing and then building new technologies for people clearly see the, you know, the usefulness or truth of it. So really the problem has always been--if you take your scriptures literally, if you had a need to see them as being literally true about the physical world and then to somehow try to accommodate that with the new results of science, that's where the conflict emerges. And those religious traditions that have not needed to be literalist have been able to see their own traditions as poetic or metaphor about the internal life of human beings. And so, it's only this literalist camp that gets into difficulty.

>> Which means in a sense that you've got the most passionate devout secularist against the most passionate devout biblical literalists; they're defining the terms of the debate while everybody else is again to the point that basically most people just don't have a dog in the fight?

>> Oh, I think that's exactly what has happened. What you've found is that pretty much--and particular this debate over evolution has, you know, sucks all the air out of the room. And here we have these two, you know, enormously powerful human endeavors. One is science and the other I would call spiritual--spiritual endeavor rather than religion. Because religion is about institutions and institutions have, you know, there's politics and there's real estate and there is--but what we're really interested in here is people's individual longing for some sense of connection to what they consider to be sacred. And so we have these two powerful huan endeavors that have had so much creativity and effort going to them. And, you know, we can't talk about the two of them in the same sentence because we immediately have to go to evolution and evolution and scripture. And it--you know, that whole debate makes it, you know, pretty much in less. You are a Christian who holds literalist interpretation o the Bible then there's really nothing for you to say about the debate so what about everybody else, you know, in their sensibilities.

>> They're sitting out there trying to figure out their own way and what to believe what the relationship between what we're learning about the natural world and what we maybe able to learn within ourselves about the metaphysical intervention might be, and did they even collide or meet at all or just go on their separate past?

>> Well, I think that is the great dilemma that we face in talking about this ethic. Society has become so polarized because of the extremes, because of the--you know, that the two ends of the spectrum are so--there're so much hostility and so much entrenchment that trying to find alternative perspectives or more enliven the perspectives that doesn't sort of compete jealously--jealousy for senses of truth. Those get squeezed out. And so there are many people I think who are, like I would consider myself to be an atheist. I don't--You know, the idea of a willful personal God does not make much sense to me. But it certainly had my sense. I came to science because of my sense of the beauty of the world and my being moved by it. Now I think there are many people kind of on both camps who either come from the science camp or come from a spiritual camp who can respect what goes on in each--in the other domain and would like to learn more but they're sort of squeezed out or just get tired of the acrimony between these two you know, camps.

>> And I guess I remember reading something with Stephen Jay Gould, the late Harvard scientist, said that there would be no way that you never determine for

sure at least not in this physical life who is right about the question of whether God exist or whether God is actually an active creative force. You couldn't do it with science or anything else. You'd have to either think about it and believe it or not.

>> Right. And that's actually a point I make in my talks and I made in the book, that in order to look for active complimentary parallels between what happens in the spiritual endeavor and what happens in the process of science, you don't have to come down on one side of the other about the nature of God. There is so much to say about this subject. I mean we've been around for 50, 60,000 years as culturally modern human beings. And this debate about whether or not there is, you know, a God or not has pretty much been there the whole time. I don't expect it to get resolved any time soon. So to say that until we resolve that, there is nothing else to say about what it means to be human in terms of what we do in science or what we do in our spiritual longing. Seems like, you know, pretty much cutting the--our knees off, you know, cutting ourselves off at the knees.

>> Our number by the way, 263-WXXI, 263-9994. It's 1370 Connection. Adam Frank of the University of Rochester speaking this evening as part of the Caroline Werner Gannett Lecture Series of RIT's Carlson Auditorium. He's the author of "The Constant Fire" which discusses the dialog sometimes contentious and acrimonious, sometimes harmonious between the realms of the metaphysical and the realms of the scientific in human thought and history. 263-WXXI, 263-9994, by all means, share your thoughts about it as well as we share the ideas here on 1370 Connection. I'm Bob Smith inviting you to be a part of discussion. Well, one thing that it's maybe interesting to a historian. I don't know if this makes sense or not, strikes me that both science and religion came out around the same time out of the same impulse. When human beings started getting curious about what the world is all about, how it works, why it works that way, and why we're here.

>> Yes. You know, that's one of the things I become quite interested in is the idea of human origins not all the way back to, you know, our fist ancestors but particularly the origin of culture which we think is only about 50,000 years old, which is enormously short. We have rocketed from being, you know, basically hunter, gatherers, small numbers of us living in caves to, you know, becoming this incredibly sophisticated culture in a very, very short time. And the impulses which in our modern life are, you know, divided between science and religion. We're in fact bonded together. They were braided together for most of our imaginative evolution. And I think to understand that proper relationship between these two impulses, you have to go back and look at how we first emerged in consciousness out of that background.

>> So is it all really part of a same impulse to understand and to know and define meaning?

>> I think actually, the place that really begins is our experience of the world rather than looking for a God's eyes perspective or an objective perspective on reality. What we should focus is that all of these began for us with our response to the world we found ourselves in. And from that both wanting to understand it and also to get closer to this sense of all and wonder we had, both the impulses that were science and religion were both at that start.

>> And maybe they're part of a same impulse?

>> I think they are still part of the same impulse. And as long as we have this--as long as we're beating each other up over the results of science which, you know, the results of science are the results of science. People who don't believe in evolution, you know, they should--the theory of evolution is really no different than the theory of aerodynamics. And so people who don't believe in evolution should stop flying in airplanes because, you know, they have the same status. So, you know, instead of fighting over the results of the latest results of science, we should be looking to what it is in us that responds to the world and how that--well, how that plays in both of them.

>> Which can take you in any number of an infinite number of directions?

>> It can take you in an infinite number of directions in terms of your--you know, you could choose to believe in a God, you know, that--your response to the sense that the world has this quality of awe may lead you to think about a God. It may lead you instead in the other direction to think about, you know, a universe without a deity but still that has some quality of being sacred, and it can lead you to the direction of wanting to be a scientist and understand the patterns and causes for those patterns.

>> 263-WXXI. We have Stone [phonetic] on the line. And hi Stone, you're on the air. Welcome.

>> Oh, hey. I am--Although it's not in sync with my radio but that's okay, obviously. I was a graduate student of philosophy at the U of R from 1980 to '82. In October of 1980 I went to the Rochester Zen Center and have been Zen Buddhist ever since. On Thanksgiving and parenthetically I grew up around the corner from Mrs. Gannett and was her paperboy. I--Oh, there I am.

>> Yes, that's right. You are on a delay. We should mention that to you.

>> That's okay.

>> You are on a--we are on a delay which may even be accentuated if you're listening to us on an HD radio which has a further built-in digital delay in it.

[Inaudible Remark]

>> So we should remind you, crank radio down when we answer your call.

>> Oh, okay. Well, yeah or if I'm 40 miles in South Bristol. But anyhow, wearing the Heart Sutra T-shirt that my mom got me at Kodaiji in Japan this summer on Thanksgiving, I started riffing with these kids about--I studied quantum physics ever since I was at U of R and if you get past subatomic particle physics and into super strength theory, it says basically the same thing ever since that I've been working on this book for like a mad man for four days on how Buddhism and quantum physics are synonymous concepts. You get--the notion is that--and I would appreciate if Dr. Frank would riff on this, the notion is that Heart Sutra says that the entire world, because all phenomena are illusory, there's no duality. Einstein threw Newton out the window. He kinda proved that at some point and they did it in self--you know, with double-slit experiment. But the Heart Sutra says that everything is the creation of a heart which is equivalent to a mind and quantum physics as I take it says that the only thing that exists in the universe when you get right down to it is energy. And I would have very

much appreciate if he would riff on the concept that that's--that those are equivalent notions.

>> Well, I don't know. I guess it's one way people interpret Einstein's equation about mass and energy. But I guess what I would ask is--this gets to a conversation we were having before the broadcast. The degree to which a lot of alternate scientific explanations of the universe and of cosmology have analogs in some way to human mythology. And I don't know whether that's because human mythology shapes our perceptions and makes us look at things, that way it' part of our collective cultural memory or what?

>> Let me first this deal with. 'Cause I thin--Yeah, that's a very interesting question. Let me first deal with this specific idea about the relationship between Buddhist philosophies, Buddhist metaphysics and quantum mechanic. There's of course a lot has been done on this from, you know, Fritjof Capra as the Tao of physics and there was the movie, "What the Bleep Do We Know." And I want you to be very, very cautious about this because quantum mechanics does not in any way support Buddhism or Christianity or any other religion. In fact, what happens with sort of what can be, you know, new age interpretations, is there sort of this enthusiasm for a particular interpretation of quantum mechanics. The beautiful thing about quantum mechanics--let me just go back and explain for people who don't necessarily know what quantum mechanic is. About 100 years ago as we were trying to probe to ever smaller scales in the universe and trying to understand the nature of atoms, we found that the world behave on radically different ways or would behave in radically different ways than it behaves on this macro skill, the things, the size of our bodies. And so physicists have to develop an entirely new framework, mathematical framework, for understanding or for predicting, you know, what went on these experiments. Now, since then--and we--after 100 years, we still don't really understand what that framework tells us. It doesn't give us a way of imagining what an atom is the way we, you know, can picture a billiard ball or something. So, there are a number of different interpretations of quantum mechanics. Some of which you could argue are--look like things from Buddhism or Yoga, others which--others are extremely mundane. And after 100 of years, we don't know which one is true. So, you have to be careful. The wonderful thing is quantum mechanics raises profound questions about the nature of reality, about the role of observers and the role observers play in measurement, do we disturb the universe by observing or not? But we do not--we're not even close to having answers. So the idea that somehow quantum mechanics supports Buddhism is it's just not true. But what it does--what quantum mechanics does do is it raises some very profound issues which now we can look out more deeply.

>> And we're probably going to spent maybe the next 100 years or more continuing to look at those issues maybe with resolving them, maybe not.

>> Well that's--you know, that is an issue in some sense for science or say there are some wonderful work at the University of Rochester, we've always been a leader in this as in interpreting or in pushing the frontiers of studying quantum systems to try and understand what really what is there. Now, one thing I do wanna emphasize though is what's beautiful particularly in Buddhist and Yogic sort of perspectives, is an idea I think that is quite useful is the idea of a codependent arising, that everything sort of supports everything else of an interpenetration of being, right?

>> And there's an idea which I think can be quite useful. It's not the issues, not whether or not, you know, it's supported by science but it is and I--who are the result of science. But it's an idea I think that in looking at the world and stepping back, I think that can be quite useful. But I just wanna--what I wanna do is I wanna be careful that sort of--that particular way of looking at quantum mechanics and its relationship to Buddhism. Buddhism doesn't need support from, you know, quantum mechanics. No religion needs support from science if you're not taking a literal interpretation of the scriptures.

>> 263-WXXI, 263-9994 to join the conversation with Adam Frank of the University of Rochester which will continue in just a moment. I'm Bob Smith. You've got there 1370 Connection at WXXI AM 1370 in FM HD2.

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>> 1370 Connection continues. Again, WXXI AM 1370 at FM HD2. Across the table from me, Adam Frank of the University of Rochester, the author of the "The Constant Fire" speaking at 8 this evening at RRIT as part of the Caroline Werner Gannett Lecture Series speaking with us right now on 1370 Connections. Speaking with you when you call in at 263-WXXI, 263-9994. Next, we're hearing from Doug [phonetics] in Fairborn. Hi Doug, you're on the air.

>> Hey, great show again today Bob and Dr. Frank. I'm enjoying your insights greatly. I'm gonna put a little bit a spin on this if I might because I--I have found that the argument between, you know, which came first, metaphysics and God and religion or science is sort of an irrelevant argument, because science was the discovery of things and religion is not. It's the discovery but it's different. And my own personal philosophy as a Christian is that the Big Bang is because God snapped his fingers and then that's became science and then began evolution. And I don't have any problem with these two worlds living and coexisting together because in my mind I can explain that for me but some people need black and others need white. Gray is a very difficult world to live in. What I would like to ask you to comment on, however, is the relationship between the natural sciences and the study of things that have happened since, let's use of the Big Bang is the point in time, because before that apparently there was nothing to study scientifically. And the sophisticate--the growing sophistication of the tools we have in which to execute science which means that naturally overtime somebody's new science is going to refute or disprove somebody's older science.

>> Which gets through the question of what happened before the Big Bang because I guess, Adam, this is now a meaningful question isn't it?

>> Yes. Let's just take that issue and then we'll answer the caller's questions. But, you know, I'm currently working on a new book called "End of the Beginning: Revolutions in Time, Life, and Cosmology." And one--the purpose of that book is to explore--you know, in many ways, we're getting science is probably at the end

of the idea that the universe started at a single moment of creation. I mean the--certainly, the idea of the universe had--we've went through a period when it was much denser and much hotter is absolutely true. But this idea of a single moment of creation now people are--they're beginning to move away from that and it could be a cyclic universe. It could be that there are many universes all popping off at the same time or popping off at any particular time so there's really no need for a bang. So, you know, just--I want to point that out that there are some very interesting ideas going on up there about--before the Big Bang.

>> Which gets us to everything from a Nietzschian eternal recurrence, in which we have all been here before, deja vu, et cetera, and that reducing it to a Crosby, Stills, Nash & Young son but maybe we do in that case if that's what you feel. Or possibility of multiverses possibility of any number of changes permutations in which even if these particular universe we know that we're in now started off with a Big Bang doesn't necessarily mean all existence started that way with that one big bang.

>> Well, and this is actually where, we know, we make an interesting connection with mythology as the more--as the cosmologist, Marcelo Gleiser had shown that pretty much all the logical possibilities for cosmology, the study of the entire universe were kind of already mapped out in the world's mythological heritage. You know, either it's infinite in both directions, you know, they always did exist and always will exist or it had a moment of creation, or there are many universes which the, you know, Hindu cosmologies had. And so, you know, we've always had this possibilities and what we're now looking for as we do our--as we complete this data gathering expeditions which is what science, the first step in science always, is that now we have to map some kind of theoretical interpretation on to the data we have. And often, we're drawing from ideas that are quite old, well again, which is this mythological heritage. So, now the question is we know, we--always the beautiful thing about science is its demand to stay close to the data. That is what really makes science unique and it forces us to sometimes abandon cherished ideas even though, you know, lots of people love the idea of the Big Bang but the data seem to now maybe perhaps pushing us in a different direction. So it's that demand to stay close to the data which is the most important thing about science. And we wanna make sure that wherever we go with our new theorizing that we still have that very close contact.

>> Right, even if the Big Bang isn't the first bang.

>> Right, right. And so we'd have to be able to find someway of--and some of these new ideas are so crazy that you think this is just, you know, something out of a Star Trek episode, right. The idea of the multiverse that there are perhaps infinite numbers of alternative universes, you know, some of which were, you know, Bob and I are, you know, in different positions or we're wearing funny hats. That idea is so crazy and yet there are conferences where, you know, PhD physicist are arguing, you know, over the mathematical details of one version of the multiverse or the other. So what is important as we travel down these new roads is that really we used to have that close contact to what the data is telling us.

>> Great, and even if there is an alternate universe in which you and I are having this conversation and we're coming from totally different perspectives.

>> Right.

>> A universe in which I'm a Boston Red Sox fan. A Universe in which--

[Laughter]

>> An impossible universe.

>> That's an impossible universe but it may. Who knows? Maybe there's a universe where it exist. And the interesting thing though, he is--and it occurs to me, I wonder if our theoretical constructs that are theoretical frameworks of analysis are dependent in some way maybe informed by the culture around us outside of the realm of science.

>> Yeah. And I think this is something I'll be talking about tonight. What I've become very interested in this new book I'm writing. One of the--I'm telling both the story of the history of cosmology and where we're at now. But I'm also telling the story of the cultural history of time. Because my argument would be that the cosmology you're born into, right. If you're born in, you know, a thousand years ago as a peasant in, you know, Europe, the cosmology you get actually was very closely connected to how you experience time, how you move through the day. Whereas now, you know, we're all used to cell phones and very exact measures of time and that is intimately connected with this cosmology of the Big Bang and, you know, star formation. So the cultural influences insight, you can't really separate out so cleanly, science from its cultural influences. And that is one of the most fascinating and intricate and interesting aspects of this whole story particularly of science and spiritual endeavor is that they have always been very, very closely coupled. Sometimes one leading the other, sometimes the other leading one. So one has to really take into account this close interconnection between the activities of science and the culture in which it's embedded.

>> 263-WXXI, 263-9994, our number 1370 Connection. The program you're hearing on WXXI AM and FM HD2. I'm Bob Smith with Adam Frank of the University of Rochester and with you on the line listening to us at 1370 Connection, writing in at asktalk@WXXI.org if you're not actually calling in at 263-WXXI, we can be accessed in fact either way on 1370 Connection. We invite you to take advantage. And we have this from Mark in Honeoye Falls, thoughts about the emergence of a new faith in this century, maybe the possibility of some new metaphysical explanation of things.

>> This in a place of course that was the Burned-Over District at one point and gave rise to everything from modern evangelical Protestantism to Mormonism to modern progressive Christianity all came out of here in this area so it's a particular historical interest to us here in upstate New York. But could we be seeing faith itself changed by the cross pollination with scientific knowledge and thoughts in a way that we haven't anticipated or in a way that we can't even fully predict?

>> I think there's an interesting idea though, but I wouldn't call it faith. I mean, you know, science--you know, both science and I think, you know, spiritual endeavor from my reading and my understanding really the most profound parts of it come from experience. So rather than faith which is just some sort of, you know, belonging to acceptance of something somebody told you the emphasis should be on experience. And speaking of sort of this area, you know, at least if we're

a little broadly. We have some extraordinary--There's an extraordinary history in America of thinking about religion and science in very open-minded ways. People like Thurow and Emerson and William James. And William James is someone I really concentrate on because in his book on the varieties of religious experience, he turned the emphasis away from scripture and doctrine and dogma which is something that, you know, is always gonna collide with science to the individual, the individual experience of the world and the sense of awe and wonder and what it drives people to. And I think that is something that is a place where there's a great commonality with science. Because science and spiritual endeavor both begin with this experience of the world standing under the--you know, the night sky with the moon so full as it's been in the last few days. And having this you know sense, this poetic sense of uplift and of awe. And that is where we begin in our attempts to understand the world or to draw closer to what we think of as being scared, that's the word that some people have trouble with. But you know, it's a word that is actually quite flexible. So it's that response that individual response I think is--can take us in--focusing on that can take us in new directions. And for the caller who was talking about Buddhism before, one of the things that's interesting about, you know, Buddhism and Hinduism is that emphasis on the individual experience. And this is something that, you know, in every religion has its aspects that focus on individual experience.

>> And I wonder if that to a certain degree informs the spiritual traditions that don't look at God so much as an individual creative active intelligence the way Judeo-Christian western faith traditions do. But look at identifying somehow God with the universe itself and with nature itself where a lot of nonwestern and a lot of non-European traditions do.

>> Well that's, I think, always been the difficulty in thinking that the debate between religion and science is gotta be about a definition of God or the battle between evolution and scripture because, you know, there's a lot of different religions in the world. And what do you do with the ones that don't have that kind of definition of God but I think all the religions. What's interesting, people talk about a perennial philosophy. All the religions do have--whether it's the institutionally dominant form or not have the sense of the importance of individual experience. You know, the Sophist for example within Islam, you read someone like the poet Rumi. You know there is always this, you know, in those kinds of writing's there is this emphasize on the personal sense of the world. What is learned, what is discovered to a personal exploration. And you know, that is a ream that, you know, sciences cannot reach in your head and tell you what you have experienced. You run into problems only when people come up with a document which makes claims about the world entire. And some of that's gotta be--that has to be contrasted of what science is finding.

>> Which is interesting because even Holy Scripture in and of itself unless you're interpreting it very, very literally and factually doesn't make that kind of claim. It's an allegory and where you get in to the science or where you get in to the historical elements of it is pretty late in the game within the last couple of thousand years when the individual human beings appear as prophets or spokespeople for God or human representations of God or whatever your faith leads you to believe about Christ or Mohammed or John the Baptist or Moses, that's where it really starts getting historical and not allegorical.

>> Yeah, that's interesting. I have one side. I was part of a round table discussion about science and religion and there was a rabbi there who said look,

you know, the six pages of Genesis were never meant to be a cosmology. That's not really what is being discussed there. They are allegorical. And so the promise become is when, and you know, there's--I've gone to a huge--one time I did a blogging heads with a guy who's a very, you know, super staunch atheist. And you know, you know, I'm an atheist too. We were at loggerheads. As I was arguing, you know, stories like the Book of Joel, you know. But the Book of Joel, a beautiful, you know, metaphorical story that teaches us about suffering and what to do in the phase of suffering. It's all depends on how you understand the poetry in these stories. If you take them literally, you're gonna run into problems. If you take them as stories that, you know, encompass wellsprings of human wisdom, then there're things that you can find in them that really, you know, can be quite helpful and can be quite enlightening.

>> Which is exactly what some of the most spiritual men I've ever met say is to be done with that kind of writing.

>> Right. Exactly. And the problem is that, you know, look, we're at a moment of particularly interesting moment in human history where, you know, we maybe have a 100 years to sort of figure out the project of civilization. We're, you know, between greenhouse--between climate change and resource depletion. Trying to have a sustainable civilization on this planet is really gonna require some, you know, pretty serious changes in the way that we, you know, organize ourselves. And, you know, to say that it's only science, this is only a question of science is to mistake the fact that with which science we deploy, which science we bring to the fore is a matter of what we value. And so this question about science and religion or science and spiritual endeavor, you know, is actually quite important now because we have to decide sort of how to organize ourselves and what we value in arranging that organization. So, you know, it really becomes finding something new, some new pathway is really quite critical right now.

>> 263 WXXI to Judy on the line. Hi, Judy! You're on the air.

>> Hi. I was--I have tuned in your show kind of by accident and I am interested in the subject because I don't know if Adam has heard of the Ramtha's School of Enlightenment in Washington State.

>> Yes, actually when I did my graduate work in University of Washington and so--

>> Okay. Actually, they did the movie "What the Bleep" and they did another movie that produces--

>> I know.

>> And what it talks about is that the void contemplated itself. If they wanna call it the Big Gang contemplated itself and expanded and that's how everything got started. And it unites science with--spirituality and science together.

>> Yeah, yeah. I'm very familiar with the movie and I knew people. And I have to say my problem is, again as there was a caller before, is the problem with that movie is what it does is it takes questions and it assumes answers. So there's a lot of discussion of quantum mechanics in that movie. But what they do is they take one particular interpretation of quantum mechanics and they run with it so far and so fast that it's so far beyond really anything that is supportable by what we--

>> What interpretation did they take, can you say it?

>> There are two. It's what would be called the Copenhagen interpretation of quantum mechanics.

>> Aha.

>> The idea of, you know, a very explicit understanding that there is a very explicit understanding of how experiment, how the observer affects the observed.

>> Exactly, well, that's true.

>> And that we just really, that's the beautiful thing about quantum mechanics.

>> We do.

>> We don't really know--

>> We do know. [Laughter] I'm people, we do know. We do. We create our reality by our thoughts.

>> Well, that's a claim. Listen, that is a--that is a very, very large claim to make and there's certainly nothing in science that supports that.

>> Well, I don't even--see--

>> Or--or--or yes.

>> If you don't believe it, then don't believe it, but that's true.

>> Of course that's an article of faith, isn't it?

>> But see that--and that is--you listen, this is the key point here, as we move forward, is to understand 'cause I have, you know, I've spend a lot of time in Seattle and many of my friends were quite new age, you know. We get into these arguments all the time.

>> But even in new age, the school that I go to and Ramtha does not--he does not like new age, we are not new age, it's not new age. It really isn't.

>> Well, I mean that it's, you know, new age is a very broad term, but this idea that, you know, the question here is really is it what can we agree upon that we know to be true. What truths can we agree upon and what mechanisms do we have to reach that agreement. The beauty of science is it gives us a tool for investigating the world and brings our results of investigations to each other and methods or rules for understanding when we think we've reached the conclusion. And so when I say that there's nothing in science that supports that, you know, there is nothing.

>> There is this, this science that Brian Greene, he supported it from what, NYU, Brian Greene.

[Simultaneous Talking]

>> I guess--are we getting--are we getting to the--to the question of whether scientists supporting something means that science itself supports it.

>> Yeah, that's a good question. 'Cause science, you know, this is actually an issue that comes in a very different way about, say, climate change, right? So there's an individual scientist who writes a paper that says climate change is wrong.

>> Does that mean that climate change is wrong? Well, science works by consensus really. There's a development. There are paradigms that that develop. And so, you know, we work under those paradigms until we have evidence to abandon that paradigm. And I think really the place we are right now in science, in quantum mechanics, is that we have this amazing formalism for understanding the subatomic world. But we don't know what it means and that's where we're at. We don't know.

>> You don't know what it means?

>> We don't know what it means in the sense of what it actually describes. What is--we can't picture what it describes. That does not give us reason to then insert the interpretation you want, right? 'Cause the most important thing about science and I believe spiritual endeavor is to not fool yourself, is to not take the answer you want and substitute that for--

>> What is--I can, well, enter the show sometime if you want. I can give you--get you in touch with people who can explain it too better than I can, you know.

>> I guess we're going to be at a situation where we're not going to resolve this--

>> No, but there are people that can--

>> In one moment, so I must move along here as we're getting--we're getting tight on time.

>> Okay. Well, I think you're--you're not very open-minded, bye.

>> But I do thank you very much for calling in.

>> Oh okay, well, I do thank you for calling in. And we have this letter written in to us at asktalk@wxxi.org as we continue our conversation on 1370 Connection with Adam Frank of the UR. I'm Bob Smith. And H.A. writes, "I recently re-watched Carl Sagan's Cosmos series, and I was wondering if you could comment on the story of how Kepler initially tried hard to move the data or trimmed the data to fit the philosophy of Pythagoras until he eventually embraced these observations, gave up on trying to make anything else of another than what it looked like it really was, and rope the laws of planetary motion that we know."

>> That is a beautiful example. Thank you very much for this 'cause it speaks to a lot of what we're talking about and both, you know, what people call spiritual endeavor and also within science. So Kepler started out--Kepler has been a fascinating subject, you know, mathematical physicists, you know, 400 years ago or so. And Kepler, at first, wanted to explain the motions of the planets in terms of--he had a preexisting idea. He thought that the platonic solids which were, you know, geometrical figures that were known, you know, as far back as

the Greeks, that each individual planet could be described in terms of one of those shapes. And he tried for years 'cause he was moved by those shapes. He was, you know, those shapes and his contemplation of them, you know, brought him to mystical rapture. And so he really tried hard to get those to fit. And after, you know, after taking the data that Tycho Brahe had had so painstakingly accumulated and trying to fit it to that idea, he had to abandon it. He had to abandon it and search for something else, and that is in time that--that eventually he was led to understanding that there was a different geometrical shape, the ellipse which beautifully described the motion of the planets. And this is what is so important, I think, in that makes science so unique and makes--from my understanding of spiritual endeavor, one things I've learned at the Zen Center is the idea that that quote is actually from a Zen master of, you know, the point of Zen practices to not fool yourself. We can't take our bias or what we want to be true and force it down the worlds throughout. It's our job to be in dialogue with the world. This is what the beautiful things science teaches us, to be in dialogue with the world and listen to what it's telling us, and move, you know, it's almost like a dance, and move in response to the lead that the data, the information that we're getting from either what people do in spiritual practice or what happens in science. You know not the spiritual practices but by your internal life. The science tells us about the physical world. But either way, you're responding to your experience.

>> And of course, realizing the things we're going according to an exact perfect circle when a planet was going around the sun got you into understanding a lot of other things and maybe helped lead us all to understanding things about gravitation.

>> Oh, absolutely, that's the beginning of it.

>> The different poles of different objects on each other, and, you know, hello Mr. Newton and then--

>> Right.

>> By the way, Mr. Newton, would like to meet Mr. Einstein, and would you like to meet Mr. Heisenberg and on and on.

>> Right. And it's a really, it's a beautiful example really of that story of how the importance of listening to the world, a lot being in dialogue with the world and being willing to give up what you think is true for what you have been shown to be true by your investigations.

>> And you never know when you're going to find that that leads you to something else.

>> Exactly. And this is sort of what's the great thing. If this infinite creative act that human beings have been involved in since self-consciousness dawn 16,000 years ago.

>> And it led us to this wonderful understanding of an interactive universe that's constantly pulling and tugging on portions of itself.

>> Right. That's that web of gravity, right. And then, you know, later and you get Einstein and the idea that space time itself is this, you know, elastic fabric. And now, you know, many ways we're coming, we're trying to push past

Einstein to some theory of quantum gravity and where that leads us, that's one of the things I'm exploring in the book is that there are some beautiful and sometimes crazy ideas. Some of which maybe true or not true, string theory, a string theory, the theory of quantum gravity, there's a lot of enthusiasm for it, you know. Years ago, a few yeas ago, now, maybe not so much, there's loop quantum gravity. So, you know, we're right now in this process of creating ideas.

>> Which in turn will make a whole lot of other things possible.

>>Right, right.

>> Things we can know, things we can understand, and things we can do.

>> Right.

>> And I think, you know, what I would like when I talk about science and religion, what I'm trying to express to people is sort of two things. One is that, you know, the world is subtle and we should not be expecting easy answers, right. And no matter what, whether in this internal, you know, spiritual longing that people have or whether it's the external world, you should expect it to be subtle, right, subtle as the ways of the Lord. You know, I'm saying that even as an atheist. Because--so to not look for easy answers and to, you know, the most beautiful thing about being human is this, you know, that we are in this dialogue, in this investigation until, you know, we finally close our eyes in death, you know. So to take it seriously and not expect easy answers or not, you know, sort of grab a hold of certainty because it makes you feel better. The world we've been born into, the gift we've been given in this world is this ability to ask questions and to probe. And we should be doing it, you know, forever.

>> 263 WXXI to Jane next on the line. Hi, Jane, you're on the air, you're gonna have the last word.

>> Okay, I watched The Ascent of Man back in the 70's with Jacob Bronowski and he dealt with this to sciences as he put it what we know so far is what we know so far that it was sort like you were talking about the fluidity of what we know. And that it's timid and it's subtle and we should respect that. And also with religion, I don't know how we get to the point where we let people find their own twist and just respect it. I don't know how we get to that. That's all I have to say.

>> Okay, thanks very much for saying it, Jane.

>> That's a beautiful point and I think that very--as you said, it's what we know up to this point and I think in my reading and in talking to people who've lead, you know, life, who've been very serious about their spiritual practice, that is also what they're doing as well. There's a line also from a Zen master which is, "Today's enlightenment is tomorrow's mistake." You know, that it's always, we're always learning, we're always going deeper into it. So what we don't want are rigid structures of absolute knowledge because the nature of being human is the nature of revising, of learning more. So I agree with you. I hope that we can get to a point where we can respect each other's truth.

>> I wonder if maybe that should be true both of the physical and the metaphysical realms of inquiry.

>> As long as the inquiry is whole hearted and willing and there's a willingness to give up cherished beliefs, I think, then yeah there is a similarity.

>> Are you an optimist on that score?

>> I am an optimist. I think that human beings especially--the reason I'm mostly an optimist is we're about to, you know, we're about to be subjected to some intense evolutionary pressure and that usually does some interesting things. The next hundred or 200 years, we are going to be forced to either change or, you know, have our numbers go down. So you know, I think--

>> We're either gonna have to clean up or we're gonna have to get out of town basically.

>> [Laughter] Right it's not a whole--and it's a long way to the next town.

>> It sure is. And with that, let's hope we find a way to clean up this with our thanks to Dr. Adam Frank of the University of Rochester speaking tonight at 8 o'clock at Carlson Auditorium [background music] at RIT as part of the Caroline Werner Gannett Lecture Series, talking with us this hour on 1370 Connection. Thank you for talking with us as well here on WXXI-AM at FM HD-2 Rochester. I'm Bob Smith, more to come on 1370 Connection after the news. We'll see you then.

[Music]