

# OpenTheo

## The Accidental Academic | Dr. Cullen Buie

December 17, 2020



### The Veritas Forum

MIT Professor of Mechanical Engineering Cullen Buie discusses his journey through science, God and making a name for himself at The Veritas Forum at Caltech. • Please like, share, subscribe to, and review this podcast. Thank you.

### Transcript

Welcome to the Veritas Forum. This is the Veritas Forum Podcast. A place where ideas and beliefs converge.

What I'm really going to be watching is which one has the resources in their worldview to be tolerant, respectful, and humble toward the people they disagree with. How do we know whether the lives that we're living are meaningful? If energy, light, gravity, and consciousness are in history, don't be surprised if you're going to get an element of this in God. Today we hear from Cullen Bui, an associate professor at MIT's Department of Mechanical Engineering, and director of the Laboratory for Energy and Microsystems Innovation.

In a talk titled The Accidental Academic, Professor Buie takes us through his journey of science and faith and making a name for himself, from the stage at the California Institute of Technology. So this talk, there was a long complicated title that I came up with, but I think you could basically boil it down to, I'm going to talk about my life and what I think it means to be successful. And for me, my faith has a strong, strong input in that.

So this is going to be a bit of a life story, so I'm going to take you on a personal journey. No judgment allowed. Well, you can judge me, but just after you leave.

So, it's kind of be three main parts. First part, I'm going to talk about how I came to faith. It wasn't something that was necessarily a given.

I didn't grow up in the church, so I'm going to talk about that story. Now I'm going to talk about how I became an academic, which also, you know, I wasn't the type who in third

grade said, I want to be an engineer or I want to be a professor at MIT. These things happen very much later in life, so I'm going to tell that story.

And then lastly, I'm going to talk about, in my opinion, how I came to peace. And note that becoming an academic and coming to peace are different events. So first, how I came to faith.

So incidentally, for me, my journey to faith is very much tied into being an engineer. So I'll tell a little bit of a story. So as Jonas mentioned, I went to the Ohio State University.

And before going to the Ohio State University, my, I had no idea what I was going to major in. So my older sister had also gone to the Ohio State University and was a pre-med major. And I thought, well, maybe I'll do pre-med.

I had a younger brother who played football and he was going to a Ohio State for a football camp. This was around June. So this is a couple months before the term was supposed to start.

My dad suggested that I come down to the camp with him to pick my brother up and meet some people and learn more about the campus and perhaps meet some administrators. So I came down. This was on a Friday.

I was in there, office of minority affairs. And someone there told me, well, have you heard about engineering? Now, I was 18 years old. I actually hadn't heard about engineering.

I had never, I had no idea what it was. It was not on my radar for majors. But they said some magic words.

They said, you know, engineering? They have scholarship money. Now, money I knew. And so they sent me to the College of Engineering.

And I started talking to someone in their, one of their associate needs in the College of Engineering. And they told me about a program where you could come to Ohio State, take some pre-engineering classes and really learn what engineering is about before becoming a freshman. And if you do well in the program, you can win scholarship money.

And the worst case scenario as I saw it was if you dislike engineering, you could pick something else. So you could check something off your list. And the associate dean that I was speaking with at the time, her name is Minnie McGee.

She accepted me into this program right on the spot. Other students had applied months earlier. But me just walking into her office literally just a dude off of the street, she accepted me into the program.

There was only one problem. The program started in two days. So I went, turned right around, went back home, told all my friends goodbye, quit my summer job, which I hated anyway.

That wasn't really a sacrifice. And went back to Ohio State for this engineering program. And that's actually what got me into engineering.

This chance meeting on a Friday afternoon down at Ohio State to pick up my brother from a football camp. And that's the kind of the seed that got me into engineering. Now, I started this by talking about how I got into faith.

So this actually leads to that story as well because during that program, I had a roommate and we became very good friends. His name was Greg Ervin. And Greg and I decided it would be great to live together as freshmen.

It turned out that Greg was also a Christian. And I, over the course of our freshman year, I kind of studied Greg and just his life. And he was quite different than everyone else who was around.

So Caltech is a lot of things. I'm going to guess probably not party school. It's probably not something that you would describe as Caltech.

And I don't want to characterize Ohio State as a party school, but when you have 50,000 kids, there's going to be some partying on Monday, on Tuesday, on Wednesday. Like, you know, I'm at MIT now and students at MIT, they party on Friday and sometimes on Saturday. It's Ohio State every day of the week.

There was something going on. But what was interesting to me about Greg was not that he didn't have fun, but he prayed and read his Bible every night, every night before bed. There I say religiously.

And it was just, it was just curious to me. And I started going to church with him. His father was a pastor.

And I remember the day I actually became a Christian, it was actually an Easter Sunday. They had a 6 a.m. service. I was at his day as church.

And there were probably just about this many people in the room. So not that many people in the room. And his dad was closing a sermon with an altar call.

And as he was standing there, he said, "If you're in this room and you're not a Christian, you need to consider giving your life to Christ today." And now, I'm the only not Christian in the room. He might as well have said, "If Cullen, you're Cullen in this room, Cullen." And I actually decided, I decided to do it that day. And so 16 years ago on Easter, that's when I became a Christian.

And so for me, interestingly, my path to engineering and my path to faith are very much linked. So for me to come to Caltech and give a talk about my faith on, you know, today and then give a talk about my science tomorrow, it's very natural because these things have always been woven together for me. So that's how I came to faith.

But the next question, I think might be, "Well, why academia?" Because as I said, I didn't know what engineering was at the age of 17. So I certainly wasn't planning to be an MIT professor prior to that. And when I first became an engineer, I really saw it as a means to an end.

I thought it would be a great way to get a good job. I wasn't really thinking about academics. And there were two mentors that I had that really changed my mind on this topic.

One of them was Gregory Washington, who's now at UC Irvine, and another was my P.C. advisor, Juan Santiago. So with Gregory Washington, I'll never forget my freshman year. He was at a Nesby meeting.

This is National Society of Black Engineers. And he came to this meeting and he was talking about academic excellence. And he said, "If you're in this room and you're a mechanical engineering major, you need to get to know me." Now, I don't know if everyone took him up on that, but I absolutely did.

And I started going to his office. And he offered me a job in his lab about six months later doing research. And that's how I got into research.

Was this mentor that I had that came to a Nesby meeting and ultimately encouraged me to go to graduate school? Now, even when I went to graduate school, I was still reluctant. So I done undergraduate research. I had an NSF fellowship, which was a huge blessing.

I was at Stanford. And when I went there, I wasn't really sure that I wanted to get a PhD. But I had an advisor that was tremendously supportive.

And really, the reason I got a PhD was that I liked what I was doing. When I got there, I was doing a master's degree. And at Stanford, for the masters, you don't have to do any research.

You can just do classes. And that's all that's required to complete your PhD. But Dr. Washington, my mentor back at Ohio State, said, "Well, just try some research." I think he's kind of like a drug dealer.

Like, just give you a little bit. And he knew that I would keep coming back. Just try a little bit.

Just try. You don't have to commit. Just a little bit.

And all the while, his vision was for me to become an academic. And so I tried doing some research at Stanford. This was the research around fuel cells and water management and fuel management.

And I really liked the research. And the only reason I got a PhD from Stanford is because that was the only place where I could do that research. It wasn't for a job.

It wasn't to be a professor. It wasn't for something down the line. I enjoyed what I was doing.

And the way to keep doing it was to get a PhD. That's why I got a PhD. I know a lot of people, certainly for students in the room, you might see someone who's a professor at Caltech or at MIT.

And you might think, "Oh, you must have always wanted to do this." And not that there's anything wrong with that, but that's just not my story. It's not my story. It's something that evolved over time.

And so, if I look back, I really think that I was kind of destined to be a professor for a few reasons. One, all of these mentors that I had that all along the way really encouraged me down that path. Even when I look back jokingly, my dad, when I was younger, gave me a nickname.

He used to call me professor. I have no idea why. I have one guess, though.

I think it's because I had a very large head. At the age of 10, my head was about the same size it is now. But I was a little smaller, so not quite proportioned.

And I think he was just hoping that I would be intelligent because to have a head that large and not be intelligent would be quite a shame. Now, I have to say something else, and this is going to move me to my third point. Getting a job at MIT didn't make me happy.

So, I thought it would. All of you are sitting here, and particularly for the students and postdocs and faculty in the room, you probably have hopes and dreams. Take a second.

There's probably something right on the tip of your tongue. What is your biggest hope? There's something that you wish if you're thinking about. It's like, if I could just have that thing, then life would be better.

Now, particularly for the students, think back four to six years ago, I bet being in a room like this at Caltech was probably one of those things. Think about that for a minute. At some point, your hope was probably to be at a place like Caltech to do your studies.

And you thought, man, if I could do that, then my life would be great. Now you're here, and you have something else. So, is there something wrong with Caltech? Maybe.

But probably not. I think there's something wrong. I think it's something inside of us, where we hope for these things like degrees from Caltech or from MIT or from Stanford or academic positions.

We think those things are going to make us happy, and then we get into them, and we find that it's like a moving target. It's like we get there, and we, you know, the luster quickly wears off. And this is exactly what happened to me when I got to MIT.

And this was most poignant a couple of years ago. So now I'm going to talk about how I came to peace. So, told you how I got to faith, how I got to academia, but there's still a lot of turmoil in my life.

And I'm still a Christian at this point. So that's also an important point. So, this point, it's not something that is purely for non-believers in the room.

I think this is really for everyone. Now about two to three years ago, I had a very rough spot in my funding. So, for those that know about academia, you have to raise money.

You have to graduate students. You have to publish papers. You have to get your research out there into the public, the public sphere.

And funding is really critical to getting that going. I had a colleague once tell me that, you know, having funding doesn't mean that your research group is alive, but not having funding means that it is dead. It's like funding is necessary, but not sufficient.

It's like a pulse. If you have a pulse, that doesn't mean you're living a vibrant life. But if you don't have a pulse, you are dead.

And so I went through probably almost an entire calendar year where every grant that I submitted was rejected. So rejection after rejection after rejection after rejection. And it really weighed on me for many reasons.

Now there were the surface, the practical reasons, right? If I don't have funding, how can I fund my students? If I don't have funding, how do I buy my research equipment? My research is experimental. So how can I do the things that I want to do without money to drive these things forward? But then I noticed that my challenge, it was a little deeper than that. I started questioning more than just my abilities as a professor, but just my worth as a person.

Should I even be here? Did MIT make a mistake? Just my core value. And I had to take a step back and wonder, "Why am I so distraught? What is... This is a big deal. So I'm having some trouble at work.

This is a big deal. But why am I so caught up in this?" And I realized that part of the problem is that I had been building my character and building my self-worth on my

achievements and on all of my accomplishments. And it wasn't until those things were challenged with this funding drought, you might say, that I realized that I'd been building my identity on those things.

Now, when you think about building an identity on something that can't hold up your... or isn't worthy for your soul, in the Bible there's a story about this. It comes from Genesis 11. So Genesis 11 is the Tower of Babel.

So I'm going to read just one verse from Genesis 11. It says, "Then they said, 'Come but us build ourselves a city with a tower that reaches to the heavens so that we may make a name for ourselves. Otherwise we will be scattered over the face of the whole earth.'" Now, as the story goes, God isn't pleased with their desire to make a name for themselves.

Now, incidentally, when I got to MIT, this was probably the chief bit of advice that I got from other people, Christians and non-Christians. Mainly, if you want to be successful here, you need to make a name for yourself. And so it kind of struck me that everyone was telling me this is the thing that I need to do.

And then when I look in the Bible, I see that this is something that God is actually discouraging, just making a name for yourself. So you might ask the question, "Well, what's wrong with that? What's wrong with making a name for yourself?" Or, "I might... I'm going to use this analogy of building a tower. What's wrong with building a tower?" It sounds like a good thing.

What's wrong with making a name for yourself? So there's a big problem with it. And I've alluded to it earlier. The problem is that if you start building your worth on a tower or making a name for yourself, you're never going to be satisfied.

Someone else is going to have a bigger tower or a prettier tower or a tower in a better location with better weather. I'm not jealous. It doesn't matter.

Someone else's tower will always look better on some level. And this doesn't lead to peace. This leads to a lot of anxiety.

And it really doesn't matter what your career is. Every single career or vocation or dream that you might have, almost all of them are telling you, "Build me a tower and you'll be happy." And as you start building that thing, you'll realize you're only going to get more and more anxious. So I'll give some examples.

So we're in LA. Let's talk about the area of entertainment. I heard a great quote by my pastor at church, but he was talking, he quoted Jim Carrey.

I'm not sure if any of you saw the Golden Globes this past year, but Jim Carrey said something very interesting. So I'm going to turn on my Jim Carrey voice and try to

reiterate what Jim Carrey said. And so he's coming to the podium to introduce this award.

Thank you. I am two-time Golden Globe winner Jim Carrey. You know, when I go to sleep at night, I'm not just a guy going to sleep.

I'm two-time Golden Globe winner Jim Carrey going to get some well-needed shut-eye. And when I dream, I don't dream any old dream. No, sir.

I dream about being three-time Golden Globe winning actor Jim Carrey, because then it would be enough. It would finally be true. And I could stop this terrible search for what I know won't ultimately fulfill me.

Now, if you go on YouTube and you type in 2016 Golden Globe Jim Carrey's, you'll see it. And this is verbatim exactly what he said. And everyone's laughing.

Everyone in the room is laughing. It's a bunch of actors in the room and they're all laughing. And they're laughing because it's funny, but they're also laughing because it's true.

It's not just true for Jim Carrey. It's probably true for a lot of them as well. They are building towers, towers of Golden Globes, towers of Oscars, towers of accolades, towers of acclaim.

And if you talk to anyone who's ever actually achieved a large amount of success, those people know that those towers actually don't satisfy you. So not just true of entertainers, entertainers also of athletes. Any of you ever heard show of hands, anyone heard of Rhonda Rousey? It's a Rhonda Rousey mixed martial arts fighter.

So just to indicate how dominant she had been in her profession. So according to Wikipedia, when she joined UFC as her first six bouts, she spent a total of 1,077 seconds in the octagon to attain her first six titles and accumulated \$1,080,000 in prize money. So for those of you doing the quick math, that's about \$1,000 a second.

I don't know how much you make. It's probably not \$1,000 a second. So her average time of roughly three minutes for a fight, she had fights that lasted 14 seconds.

But her average time of roughly three minutes for a fight was faster than the average time for any weight class and faster by a margin of five minutes. So it's totally dominant. Now for those who had heard of her, you might have also heard that this past November, she had a fight that she lost and she lost rather badly.

Now what came out recently as in just this past week, there was an interview where they were talking about how she felt after that fight. And here's her talking about how she felt in the hospital directly after that fight. Honestly, my thought in the medical room, I was

sitting in the corner and was like, what am I anymore if I'm not this? Literally sitting there thinking about killing myself.

In that second, I'm like, I'm nothing. What do I do anymore? No one gives a SHIT about me anymore without this. One loss.

One loss. Now I don't want to try to make it sound like I'm picking on Ronda Rousey or picking on Jim Carrey. They are simply doing what many of us do.

You're here at Caltech if you're a student, if you're, let's say you're a graduate student, you think that your success is going to be built on the number of journal papers that you accumulate or the prestige of those journal papers. And I can tell you now as someone who has accumulated more journal papers than many of you, that that's not going to do it. Some of you think it's going to be money.

Here's an article I found in The New York Times by a guy named Sam Polk. I highly, highly recommend this article. Highly recommended articles.

An opinion piece in The New York Times about a year ago, January 18th, 2014. So he's a former investment banker and this is what he said to open the article. In my last year on Wall Street, my bonus was \$3.6 million and I was angry because it wasn't big enough.

I was 30 years old, had no children to raise, no debts to pay, no philanthropic gold in mind. I wanted more money for exactly the same reason and alcoholic needs another drink. I was addicted.

Later on, he goes on to say, I was nagged by envy. On a trading desk, everyone sits together from interns to managing directors. When the guy next to you makes \$10 million, one or \$2 million doesn't look so sweet.

Now, I don't want to leave my own profession off the hook. Academics, this is also true of many of us. So interestingly in academia, I think the tower is very much represented by your CV or your curriculum detail.

Think about what goes into a CV. So if you were going to go to industry for a job, you might have a one, two pages max resume. Like that's it.

It doesn't matter what level you're at. You whittle everything you've done into one or two pages, not in academia. You put everything in there.

Six grades, spelling B, second place, spelled euphoria correctly. You put all the students you advise, all of your papers, every talk you've ever given, every award you've ever gotten. And then what do you put at the top? You put your name in big, bold print.

You're basically building a tower that continues to get larger to glorify yourself. I think one issue with all of this is there's a term that I saw very recently, a researcher at

Stanford coined this term a successaholic. And I think the challenge for many of us in this room, if you're at a place like Caltech, you guys are successful.

Let's just face it. You guys, you're talented. You've been blessed.

You worked hard. You are at one of the top institutions in the world for science, engineering, and technology. You are successful.

And it's really hard to get to a place like this without having a long history of success. And the challenge is, it's really hard not to get addicted to that success. And I think that's the challenge that all of these people mention, academics, Wall Street, entertainment, all of us have the same challenge of potentially getting addicted to success.

So the question is, what can you do about it? Everything around you is telling you, build a tower. Everything around you is telling you, make a name for yourself. Everything around you is saying, I'm going to judge your value based on the amount of stuff that you accumulate.

You're basically a slave to those things. So if you are in academia and you think, like I thought, and I have to battle with daily. So just to be clear, I don't want to make it sound like this is something like I'm free and I'm the Zen master.

And I know exactly what to do, just follow me. This is a daily struggle because you're constantly getting pulled in by everyone around you into this game. It doesn't matter where you are, you can be a slave to this.

So if you want peace, what can you do? Interestingly, the Bible has something to say about this as well. Jesus says in Matthew chapter 11, 20 to 30, "Come to me, all you who are weary and burdened, and I will give you rest. Take my yoke upon you and learn from me, for I am gentle and humble in heart, and you will find rest for your souls, for my yoke is easy, and my burden is light." Notice that he essentially says, "Forget those other yokes." He doesn't present a life free from a yoke.

You're going to be burdened. You're going to be a slave to something. There is no, there is no life where you are free from a master.

You have something that you're hoping for, and that hope is going to drive you, and you are going to be a slave to that thing, whatever it is. All of us have one. If you take a step back and examine your life, there is something there that you hope for more than anything else, and that thing is going to drive your life.

What Jesus says is that if you take up his yoke, his yoke is easy, and his burden is light. And the reason for that is there's the difference between having Jesus as master and these other things. All those other things tell you, "Sacrifice yourself for me." Academia

is going to tell you, "Academia tells me at a place like Caltech.

I'm sure it tells you. It says, "Sacrifice yourself for me. Sacrifice your relationships for me.

Sacrifice your sleep for me. Sacrifice your health for me." You see your advisors. I'm sure you see them neglecting their families, and then you see them successful, and you think, "Well, maybe that's the model that I need to follow." Everything is telling you, "Sacrifice yourself for me.

It's all around us." Now, what does Jesus say? Jesus says, "I sacrifice myself for you." It's the only master you can have that sacrifice himself for you. Every other master says, "You kill yourself." Jesus says, "No, I let myself be killed so that you wouldn't have to." That's why the burden is easy, and the burden is light. You don't have to do anything.

You don't have to accumulate something to justify yourself. Jesus has already done all of it. Until then, you can go to academia, or to entertainment, or to athletics, and you can do it just because you're interested in it.

You can do it just because you like it. It doesn't define you. Imagine a Caltech where all the professors were teaching their classes simply because they wanted students to learn.

They didn't care about their course evaluations. They didn't care about what it did for them financially. It was more so about, "I just want these students to learn.

Imagine a Caltech or an MIT or any of our top institutions where that was the prevailing sentiment." Earlier, I told you that I have come to peace with these issues, and you might ask, "Well, how exactly did that happen?" Well, I'm on the tenure track, and I found that the reason I was so distraught when I had this funding challenge is because I thought I wasn't going to get tenure. That was the thing. I went to tenure at MIT, and everyone around me was saying, "You've got to do what it takes to get tenure at MIT." I saw that potentially slipping away with this funding issue that I was having.

But looking at the Bible and thinking about it, if Christ has given me this justification, he justified me through his work, I essentially have tenure already. But tenure not at MIT, an eternal tenure, a divine tenure that no one can ever take away. If I have tenure in heaven, as I like to say, then tenure at MIT is a big deal, but not as big a deal.

I'd like to get it, but there's nothing that MIT can take away from the status that I've already gotten in Christ. Now, I can just do my research because I love the work. I can come to Caltech and give this talk, and then give a research talk tomorrow because I'm not really as worried.

It doesn't mean I'm not concerned. It doesn't mean I don't take my job seriously, but it just takes the edge off. It totally takes the edge off.

So that's my message. All of you here, it doesn't matter what where you are. You have tenure now.

You have tenure now. You could be an undergraduate student. You could be full professor.

Nobel Laureate. It doesn't matter. You could have tenure now in Christ.

But unlike the tower building, you can have a tenure that's not going to fade, not going to rest. You don't need to compare to your neighbor. Your tenure is secure, and it can be in Christ.

So thank you. My research is quite varied. I'll talk about a couple of things.

One of them, and I gave a talk on this yesterday at Stanford, my group has been looking at interactions between liquid droplets and porous media. I know you're thinking, how boring. But actually, we found some interesting things.

So a couple of years ago, we found that under conditions consistent with light rainfall, when a liquid water droplet will hit many types of soil, it will actually create aerosols. So there will be air bubbles that get trapped at the surface, our interface between the gas and the soil, or the liquid water in the soil. And those air bubbles then rise due to buoyancy to the surface of the droplet.

They burst. They release a capillary jet that then breaks up into small droplets, and you get aerosol formation. So you might think, well, that's kind of interesting, but why is that useful? Well, one interesting thing about it is, think back to when you were a little bit younger, and let's say it's the summertime, and it's raining.

So you have to come inside, it's summertime, it's raining, you go inside. The rain ends, you go outside. Can you smell something? It doesn't smell a little different outside.

So that's a phenomenon called petrocore. Petrocore was coined by a couple Australian scientists in the early '60s. Petrocore meaning rock, ichor, meaning kind of essence, so kind of essence of rock, and they describe the origin of this smell that occurs after rain.

They never describe the mechanism. And so we believe this mechanism we found of liquid droplets hitting soil and then being aerosol could be the mechanism that leads to this smell that's in the air, much like if you have a glass of champagne or sparkling water or carbonated beverage. When you first pour it, you see that fizz above it, and the aroma is much stronger in those first instances.

We believe it's a comparable phenomenon. Another thing we've been looking at is getting DNA into microbes, specifically bacteria. So there are roughly 10 to the 6 different species of bacteria on the planet.

We've catalogued and cultured on the order of 10,000, and we can genetically manipulate order 100. So there's a lot of biological potential out there that we can't even access. One of the reasons is we can't get DNA into those organisms.

Getting the DNA in allows us to program them to do useful things for us. As an example, E. coli, so many of you have heard of E. coli, but you've probably heard of E. coli mostly in negative terms, but E. coli makes about 20 billion dollars in industrial chemicals per year. So that's just one organism.

So each organism could potentially be a billion-dollar industry, and my group is working on taking those thousands upon thousands of other organisms that are currently inaccessible to genetic engineering and getting DNA. That's really amazing. Hanging gears, you feel a very interesting niche.

You are a scientist, you're a Christian, you're a person of color. How has your experience both within the church and within academia, how has that contrasted, how has it been coming from your experience, working in these two realms, has one been easier, one been harder, how has that been for you? Yes, I would certainly say scientific realm has been the more difficult one. Being a Christian in science and being African-American in science, there are several Christians who are in science, but many aren't as outspoken.

So sometimes when you come out and you say that you're a Christian, you can get some, there can be some friction. And being African-American, unfortunately, I can't hide it. So if I wanted to, I wouldn't have to tell people I was Christian, but if I walk in the room, I was like, are you African-American? Like, you noticed.

So they're kind of all just all kinds of interesting things that happen being African-American in academia. So I'll tell a quick story. A couple years ago, I was at a conference in Italy.

There were about 300 people there and there were two African-American males, including myself. And I knew this was going to be a problem. Just didn't know how.

And so a couple of days into the meeting, a young woman from Virginia, bless her southern heart, she comes up to us and she says, "You guys look so much alike, so much alike." I mean, you guys even sound alike. Are you guys related? And we looked about as much alike as Barack Obama and Flavor Flav. We just both happened to be black and in the same conference.

But being, I did my PhD at Stanford and I'm at MIT now, two entrepreneurial places. And I've been thinking recently, how can I take advantage of this? Clearly, all black men look alike. So if all black men look alike, that means I could be any black man I want.

So I think after getting tenure, I'm going to start a company, I'm going to call it black man adventure vacations, where any black man can be any other black man. So you

could be, you could be me. You could be an MIT professor.

You could teach my classes, could grade my homework assignments. You can't come home to my wife though because she's black and she'll notice. So be, be, be back to the core subject though.

Being African American in science, you kind of stick out and I find that it can be a double-edged sword. So you're always noticed. Like if I give an invited talk, it's really clear.

Like, well, that guy was different. And I think it can cut two ways. If I give a talk that's bad, then it looks really bad.

If I give a talk that's good, I think sometimes it looks too good. Right? Because maybe people didn't expect a good talk. And so then I give a good talk and it's like, whoa! So I don't know.

I'll stop there. But I have many stories that I can tell later about less flattering things that have happened just because of being African American in science. So while you guys figure out who wants to come to the right side and the left side and ask some questions, I want to ask you to ask some to follow up on that.

So has your experience in the church been different? Or how is that contrasted maybe with experiencing? Sounds like there's always this pressure to live up to expectations or divide expectations or something like that. Yeah. So I think one thing that's been a little challenging, and it's going to be hard to say that's in that sound overly critical of certain groups, but one thing that's been a little challenging is finding, for example, finding a church experience that satisfies all of me.

So what do I mean by that? Meaning there's a certain way that I kind of, I like music and it's kind of more traditional the way African American churches have worship. And then, but then there's also a certain way I like the worship, the rest of the worship and the sermon to be conducted. I like things that are a little more intellectual, I like things that are a little more thought out.

I like things that are almost like a Bible study. And it's been difficult for me to find churches that do both. Like churches that are, like I said, once again, I hate to generalize, but oftentimes, churches that I find very thoughtful and very, you know, sound scripturally based, the worship style, I just really don't like it.

Or if I really like the worship, then I hear the preaching and they're saying things that sound like the Bible, but not exactly. It's like, I think at some, at some point in history, there was a Bible verse that someone was quoting and then it, like by the end of it is like, I don't know what they're saying. And that doesn't, so kind of, I rarely feel fully satisfied.

But then again, when I think about it, that's probably most everyone, at least I would hope so. We should all feel a little uncomfortable at church. If it's if it's 100% satisfying, then that probably means that there are other people in your congregation or there aren't, there isn't enough diversity in your congregation.

If it's, if everyone in there feels like they're getting all of their needs met, probably too homogeneous. So. I think I find for myself just that the two dimensions, there's such a richness that the Christianity brings to the academic, that without it, it just would be so sterile, you know, and yet the academic brings a sort of a rigor that you were mentioning to some.

It's your Christianity, which is great. Well, I think, I think one thing that's been while we wait for questions, you guys. Yeah, you guys feel free to whatever you want.

There's two microphones, feel free to come over and ask your questions. Well, one thing, one thing that's impacted me is I think early on, and I think for a while, there's been this notion that, well, if you're going to be a Christian, when you walk in the door, you need to turn your mind off for some reason. But the Bible, Jesus very clearly says to love him with your heart, soul, and mind.

And I've taken him very seriously on that. And I find that having my mind more engaged has bolstered all aspects of my faith. It hasn't lessened it.

And I think that's been something that being an academic has kind of has kind of pushed. I want to have my mind engaged. And as I've engaged in more, the Bible is such a fascinating piece of work that the more the deeper I get, the more I realize that I don't understand.

And it just keeps getting better. And so that's, it's very engaging. And so I find that Christianity has engaged my heart, my soul, and my mind.

And I can't think of many other things that engage all of those levels. That's great. Let's see, on left, I guess, from the other direction.

Yes. Thank you for sharing your heart with your journey with us. Furious, did you gain tenure at MIT? And how would that go? That is a great question, not yet.

So if you want to send letters, I can give you the letters. No, I'll go up for tenure in about a year. So for me, these things are very much, you know, current events.

Trusting God. Thank you. You point that it's the academy is not an environment that's free and open to contrary ideas the way perhaps its ideal would be.

So I'm curious about your own experiences, living and being Christian in an environment that eschews any faith belief system and in fact frequently ridicules it. Yeah, that's a

great question. I've incidentally, I found at MIT in particular, I can't speak for every university or every situation.

One, MIT, there are a lot of Christian faculty. Way more than you might suspect. So on the one hand, I feel as if there's this perception that Christian scientists or certainly engineers are dwindling.

And that might be the case. I haven't seen all the data on those things, but my qualitative evidence, I know several people around who have very similar beliefs as I do. And so I think maybe the challenge is that those who are perhaps anti-faith are a little bit louder in what they're doing.

That's actually one of the purposes of Veritas is to get people like myself out there to show that this is normal. This is not like one offs. There are several people out there that are trying to pursue science and engineering and technology at high levels and all aspects of research at high levels and also believe in the Christian faith.

So I think on some level that this perception, it's a bit overblown in the sense that the people who are negative might be more famous than those who are perhaps pro-faith. And but even beyond that, I found most of my colleagues, and maybe it's maybe it's just a practical nature of an engineering school where you know, if you can, people don't really mind if you are Christian. I haven't really had much, much issue, much issue at all.

It's almost like they think, well, if that's working for you, that's great. Like it's a very practical approach. Well, it looks like it works for you than more power to you.

So I haven't had much issue personally, though, I do know colleagues. And it also depends on like what field you're in. Like if you're in biology, or certain aspects there, there your faith, you know, you can be discredited.

Like people will question your rigor as a scientist if you just say you're a Christian. So it's a little different, it feels like that. Hi, could I ask you two questions if possible? Yes.

No, that wasn't one of them. That was, no, no. So three questions.

Sure, sure. I commend you for being bold with your faith. I'm familiar with Francis Collins, and the poor guy has been ridiculed by, you know, religious people.

Don't take him seriously as a Christian, and yet scientists don't take him seriously as a scientist. And obviously the man is very brilliant on both ends. So how do you have any opinions as far? How do you navigate this slippery slope to come off to not like garner negative publicity towards your name or negative connotation so that would be the first one? Yeah, that's a really good question.

And on some level, because I'm not nearly as famous or as prominent as Francis, I don't

have the same problems, more money, more problems. But you will be, right? Yeah, yeah. After that tenure.

But I would say my kind of advice to maybe Christian specifically on this is I feel like it should feel like a struggle. There should be some tension, partially because the Bible is pretty clear that the viewpoints of the world and the viewpoints of the Bible are kind of at odds. And so if you are a Christian in an area as hotly contested as the things that he's worked in, you're kind of right at the interface.

And so you're bound to get from both sides. And I really don't think you can worry about what other people think or say. It's going to, it's not that you don't care because it's hard to be a human and not care what people say.

I'm always curious when people say I don't care what anyone thinks about me. That's really hard, that's really hard to do practically. Like I don't know too many people who, where that's really the case.

But that said, I don't think you can let it control you. I don't think you can let the opinions of, in his case, Christians or scientists who might, you know, throw stones. I don't think you can let that dictate what you're going to do because ultimately you're not going to be judged by those people anyway.

So I think it's natural to feel some tension because those things are in tension. And if you're sitting in the middle, you're going to be kind of pulled in both directions. And the second one is about, I'm a scientist.

So, when I see an observation and whatnot, I make a hypothesis and then I come up with a bunch of experiments or observations that will either validate or refute my hypothesis. And then if it validates it, my conclusions can be used for further investigations, like the scientific process. I'm sure, yeah, you know.

So why, when it comes to God, to me, it should be something that is in faith, either God exists or he doesn't. And for my own personal opinion is when I go through this scientific method to evaluate God, it just, it seems like the evidence is really personal. It's not clear.

It's not concrete. It's more from person to person. So I wonder, have you ever thought about running experiments yourself to prove that God exists? Because I don't feel that's done enough.

And I just wanted your take on that. Yeah, I mean, that's an interesting question. I think it gets to the question of, or maybe this thought of what is real.

So when you're talking about things in science, you're thinking of maybe experiments on the material world and things that you can see and touch and measure using physical

laws that we can manipulate. And the challenge might be, well, with God, if I can't see him and I can't touch him and I can't measure him, then is it there? I mean, they do. There have been scientific experiments that have gone on the actual terrestrial that are beyond touch.

So I kind of, it's a cop out. Well, I guess my thought is that there are other forms of experience that are also very, very real. So I'll give another, I'll give a relational example.

So I don't know if you grew up with your parents, but for anyone in the room grew up with your parents, the babies in the back clapping about parents. Sorry. But for anyone, how many of you, as a thought experiment, how many of you have gotten a DNA test done on yourself and your parents? Now, well, let's think about this for a minute.

So many of us in this room are scientists and we're, I think your question is you want to be able to make your beliefs on sound evidence. But you could get sound evidence on your parents, but you'd never make them do it. Like, that would be a very weird conversation.

Like, "Mom, I love you." But sometimes, "Dad, I'm not sure." So I would like to get tested. And you have, and you think about it, you, you probably feel very sure that your parents are who they say they are and all of your evidence is circumstantial. You happen to be in baby pictures, but that doesn't mean that they're, you're actually their baby.

Yeah, but here's the thing, but do you feel a need to go to that level, to feel, you have a feeling for them that is very real and you don't feel the need to go to that level of, you know, getting the physical evidence. So I guess what I'm saying is that the physical evidence, that would be nice, but that doesn't necessarily constitute all the evidence that you can need to believe something is real. It's necessary to determine where your biological parents are.

And you said, you know, I'll give you a million dollars if you can prove so. I can do that. What if I ask you, I'll give you a billion dollars if you can prove that? Well, think about this.

If you had the million dollars and you ran the test, would you, would it change anything about your feeling for them? No, as far as, if you want to answer, do the DNA test groups that they're not? Are they the correct answer? Well, I think you can know, I think you can know God without the evidence that you're seeking. I think you know a lot of things in your life, without similar levels of evidence. I think you, you played, you're placing a barrier on God and knowing God that isn't placed on other relationships that you readily operate in every day.

So we can continue later. But yeah. Thank you for that question and for the answer, please.

Yes. So as a scientist, you're running a research group. You're asking interesting questions about life and how things work.

Is there ever a time where you've decided, no, I'm not going to research this subject because I don't think it's ethical. And if that's the case, could you give us some sample? Yeah, that's a great question. I think for my work, I haven't run across a case where I thought I'm not going to do this because I don't think it's ethical.

But what I have started to do, really in the last maybe three to five years, is more thinking, okay, I have a couple options of things that I can do. What will have larger benefit for society and for the world? So there's some things that you could do. It's not necessarily unethical, but maybe it could raise more grant money.

So certain types of research, there may be more lucrative than other types of research. But a research area having more research funding doesn't necessarily mean it's more important for society. And so I've been doing that kind of, maybe that kind of analysis.

I haven't necessarily run across a case, at least personally, where I felt I shouldn't do this thing because I think there's a kind of an ethical sense that maybe this work shouldn't even be done. But it's been more subtle. It's been, yeah, I could do that work.

And maybe I could get a grant or two on that, but is that really helping the world? Whereas if I do this work, I can see maybe this will have a bigger benefit for the world, which similarly gets to kind of my faith background and feeling like the work that I do should be for the common good and for kind of human flourishing. Hey, a question? Okay, I do have a question. So you talked about how you found peace from sort of the need to build up your CV and make a name for yourself.

I was wondering as you, you know, you're still continuing to struggle to really achieve that. But as you're doing it, have some of your colleagues notice that? And if so, what has their reaction been? So I don't know that people, so here's the thing. If I'm doing my job correctly, on the outside, I don't think people would really look at my people.

I don't think people would look at my CV and think, oh, yeah, he's not, he doesn't care. Right? Because if I'm doing my job, I should still be publishing papers. I'm still doing things that ultimately go into the CV.

Now, where I think it comes in is maybe more softer things. So I'll say, I've had people several times say to me recently, oh, wow, you're going up for tenure in a couple months, you don't look that stressed. Why aren't you more stressed? And what I told you guys is the reason why.

So that's often for me an opportunity to witness, like, well, let me tell you why I'm not more stressed. Because I would normally be, but for my faith and this kind of different perspective that I have on the process. And to be honest, it's being tested right now.

It's easy to say those things when you're not going through them, but I'm going through them right now. So it's a daily kind of struggle of not trying to get sucked into trying to glorify myself through my work. Good evening.

I, given the history of the kinds of things that happen in a school like this and others where the pressure of academics presents itself, I believe that the talk that you've given is really very helpful. And, you know, maybe should be mandatory for a lot of students to hear. All right.

Now, I work at a high school, and every day I really feel thankful for some of the students that I'm able to talk to and listen to change within them. But I guess I wanted to ask you, when many decided that you were the person that should come to that university, and for you met, was it George? Great. Great.

What was it that she saw or did she explain to you what it was that drew you to her? George. You know, that's a great question. And I should ask her to be honest.

I don't know why she took a chance on me. Because I didn't apply to the program. I just walked in.

And this is one of the reasons why it's hard for me. It would be hard for me not to believe in God. Because that just seems, the alternative explanation is possible that it was just random and that she just happened to do it.

And that I am just, you know, the result of a bunch of random events. But it seems so expertly orchestrated as like that seems like a very, you know, probable solution or, and this is before coming to faith. So when I walked into her office, I wasn't a Christian.

And, you know, in a point on that, I think God is working in everyone's life in this room, Christian or not. But that's another thing. I don't know why.

I do know that it was a divine appointment. Would you say that those towers that you spoke of in building that you kind of always been the kind of person that never took that too seriously? No, I think, I think the opposite. I mean, I think it's a hard balance.

But I think for a long time, I was building my, my self-worth on my achievements. And it's very subtle. It's very subtle.

It's like you get, you get an A and you think, oh, I worked hard. And then you get another A. It's like, yeah, I worked hard again. And then you get another A. It's like, yeah, I'm an A student.

That's who I am. And then you went in a war and it's like, yeah, I am, I did work hard. I did this.

I am, I am fortunate. Like at first you're kind of humble about it. Like people say, oh,

you're so smart.

You're like, and on the, on the server, what you tell them is like, oh, thank you. And then it's like, yeah, I know. And, and those little things over days and weeks and months and years, it's not like all of a sudden, but after years of praise and doing relatively well, next thing you know, you are this kind of different, you're kind of different.

Like, I bet if you were to ask Rhonda Rousey before she ever started fighting, right, if she were 12 and one with six titles, would she be suicidal? She'd probably say 12 and one with six titles and a million dollars? Like that would be great. Like before she started fighting, that probably, that would have sounded great. But after 12 wins in a row and all of that dominance and all of that money and all that publicity, then that one loss looks different now because she's now this different person than she was before she started fighting.

And it was probably gradual. It probably wasn't overnight. It was probably win after win after win after win slowly building up this tower.

And then the loss threatened it. And you didn't even know you had the tower till you had the loss. One more question and then I'll have a final question for you.

Okay. So yeah, thank you for a great talk and you're, you are a very inspiring speaker. And I asked this with great respect.

How do you reconcile the fact that there are multiple religions in the world with multiple, it seems, conflicting worldviews. And if it was the case that you were born in India as I was, you would probably be a Hindu. If you were in Pakistan, you might be Muslim.

And it seems like, so perhaps you can believe that there is one God. But if you also believe everything in the Christian Bible, do you think it conflicts with other religions? And if so, do you think one is the right one? Like certainly all of them cannot be true if they conflict with each other. So I'm just curious what you think.

Yeah, that's a great and important question. I mean, part of it gets the things that I'll be honest, I don't know. And I'll tell which parts those are.

Now first, to the question of, I think there is a truth. And as you said, I don't think it's possible for, as you mentioned, Islam and Buddhism or Hindu and Christianity and Judaism. I don't believe all those things could be true all at once.

Like there are claims within each of them. Like Jesus can't be God. And then, you know, the Quran can't be correct if Jesus is God and vice versa.

So maybe I should stop there while I'm ahead. But no, I, so, so I, I do think that there is, there is a truth. Now, I think that the other interesting question that you mentioned is,

you know, well, how do you reconcile, you know, if you were born in a certain area, that's going to have a huge influence on the, the, you know, perspective on truth that you see.

And then if Christianity is true, what does that mean for the souls of those people who maybe were never exposed or just due to where they were born? Might not have been, you know, exposed to Christianity or an, and so like, does that seem fair? I would say that's a, that's a hard question that I honestly don't know the answer. What I do believe though is that God being a just and loving God has a way to reconcile it. I don't exactly know what that is, to be honest.

I don't exactly know what that is. So I think that is a, that's an important question. To the first question, I do think that there is a truth.

Like there can't be a God and not a God, like those two things can't be true or there can't be the God of Judaism and the God of Christianity and the God of Islam. Like those, they can't be all true at the same time. But in terms of what does that mean for bless you, for those who perhaps are exposed to the other worldview, whichever one may not be true, I don't know.

I heard, I heard that, there's an interesting, maybe you can help me on this. Is it Pascal who had the Pascal, the wager maybe? Yeah, yeah, okay. Thank you.

I didn't want to get it wrong. But basically he, the essence of it is he talks about how you could take two, two, two potential viewpoints. One, a world where there is a God and one where a world where there isn't a God.

Which one is, you know, if you're doing a risk analysis, which one is, are you worse off if you're wrong? So, let's say if there, let's say there is a God and you live your life believing that there isn't one, then there very much could be consequences at the end that you will have to deal with. Conversely, let's say there is no God, but you live your life as if there is one. Then in the end, well, there was no God.

So it changed your life some, but there aren't eternal consequences for what you, for the decision you made. So it's just an interesting thought experiment. I'm not saying, I don't know that that's a great reason to believe in God.

So believe in God because it's the, it's the, the, the safer bet, but this is an interesting, interesting way of thinking about it. Well, I said first talk about coherence and, you know, within a system of thought is it, is the system, it's actually coherent and, and, and so that question with regard to, to our modern reductionist thinking of, let's say if everything is matter and energy and does that explain every phenomenon that you see? Does the concept of justice or love make sense if everything is purely matter and energy? Because at that point, then there's no free will. So, so self-coherence is at least one test.

Oh, and thank you so much. I was going to just finish off. I think we're pretty close to the art closing time with one, maybe if any concluding thoughts you have, I'm thinking of students that might be here and are still, you know, asking questions like the excellent one we just heard right now that are not believers, but you're, they're, they're hearing things about your experience that are intriguing, but they're skeptical or they're Christian students and, I guess, looking at where they're in their life and now you are, you, you've passed that and with so much success in, in really the deepest sense of the word.

What would you say as your advice or your final thoughts for everyone as we, as we close up? Yeah, so I was thinking about this and given that word Caltech, let me give kind of an engineering technical maybe analogy. I, and this actually goes to, to your question about like being able to test, test God and tests if God exists. The Bible has very specific promises.

It says, if you do this, if you live certain ways, there are things that will happen. God says, you know, I will keep in perfect peace. He keeps his mind stayed on him.

They're, they're, they're promises all throughout the Bible. And I think those are things that you can actually test. So I, I actually in many ways view the Bible almost like an engineering textbook.

So in an engineering textbook, there's theory and then at the end of each chapter, there are problems to work out. And if you just read the text and don't work out the problems, you don't learn the subject. You have to work out those problems.

The Bible is similar. You could read the Bible. So here's the thing, if you are seriously curious, you have to open the Bible to really be able to have an opinion.

And actually, even more than that, you have to try the problems that are in the Bible. And I think the problems are the things like these promises. You have to try those things out.

And then if you try those things out and you find that it's not working, then you've actually run, you've actually run and experiment the way it was meant to be run. The Bible is meant to be something that you read and just and then put into action. And if you try to put it into action and you feel like it is quote unquote not working, then you can say you actually tried it.

Just reading it wouldn't be enough. And this actually goes for Christians and non-Christians. So I think as Christians, I was, I just gave a testimony about how distraught I was when I was going through this challenge of funding.

And the problem was I was not applying the Bible to my heart. I was reading it. I was going to church.

I'd been going to church for more than a decade. It wasn't that I didn't know the stuff. I wasn't applying it.

Like I know that Jesus says his burden is easy and his yoke is light, but I hadn't taken it up. No good. The problem is it's no good if I don't actually use it.

And so I think this actually goes for Christians, non-Christians alike. If you're seriously exploring, I suggest really trying the Bible, which means reading it and actually with other believers, with those who are believers. Like if you were taking an engineering class, some of you are smart enough in this room probably to be able to pick up an engineering textbook and learn it all on your own.

The Bible is not really like that. It kind of really begs having a community, having a teacher, having someone who can help you through it. So if you're really curious, I suggest picking it up, trying it out, and talking to people who walk through it and asking them questions like you would in any class here at Caltech.

Similarly for those who are Christian, apply it to your life. Having the knowledge of it is not enough. If you like this and you want to hear more, like, share, review, and subscribe to this podcast.

And from all of us here at the Veritas Forum, thank you.

(gentle music)