Episode 34 - Shooting For The Stars

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**SPEAKERS**

Dr. Kartik Sheth, Nicholas Lampietti, Jane Hoffman

**Jane Hoffman** 00:05

Dr. Kartik Sheth's career has spanned the solar system. From Grinnell, he received a master's degree in physics at the University of Minnesota and completed a master's and PhD in astrophysics at the University of Maryland.

**Nicholas Lampietti** 00:17

A world renowned astrophysicist with a focus in the areas of galaxy formation and evolution, star formation, and the interstellar medium. He's conducted groundbreaking research at institutions like Caltech and the National Radio Astronomy Observatory.

**Jane Hoffman** 00:33

When the White House called, Dr. Sheth answered, serving as Assistant Director for Research Infrastructures and Science Equity at the White House Office of Science and Technology Policy under President Biden.

**Nicholas Lampietti** 00:44

And in case his current day job, a program scientist at NASA headquarters, where he oversees space missions and cutting edge technologies for research using stratospheric balloons and sounding rockets wasn't impactful or engaging enough. Dr. Sheth is also a committed activist, an identity that manifests in his work advancing diversity, equity and inclusion initiatives and through the environmental nonprofit organization he founded Empowered Earth Alliance.

**Jane Hoffman** 01:11

On this episode, we discuss his advice for navigating and succeeding in academic government and nonprofit spheres, especially for individuals who have been historically underrepresented in those spaces. The universe is unimaginably vast, but as Dr. Sheth shares with us, we live in a small world where connection is everything. From the Center for Careers, Life and Service at Grinnell College, I'm Jane Hoffman.

**Nicholas Lampietti** 01:34

And I'm Nicholas Lampietti. Stay with us.

**Dr. Kartik Sheth** 01:46

My name is Kartik Sheth. I am a program scientist currently at NASA headquarters, which is a very strange title. What does a program scientist do? But basically, right now I am managing a number of space missions, suborbital missions, a lot of funding for research and analysis. So effectively, help guide the astrophysics, research and development for the country. My particular role in that, I manage a budget of roughly $1.5 billion a year that the federal government gives us. Majority of that money goes into missions. So NASA, we often joke that NASA--N-A-S-A--stands for Not A Science Agency. That's just a jest because it really is an engineering firm. And what we do is really cutting edge technology and engineering to be able to make the amazing discoveries and things that you hear about on news, you know? New planets being discovered, us going and hitting an asteroid, going to the space station, going back to the moon. So we're a small piece of it; we do the astrophysics portion. It's really difficult to put myself in a box, which I think most Grinnellians will find themselves facing this struggle their entire lives because it's really hard to define us. Unlike anybody else, I think Grinnell really teaches you to always be learning new things and be open to it. And I really appreciate that. So I sort of describe myself as a person who is a scientist and a science and technology expert--that's my formal training. But I've had a parallel career in diversity, equity and inclusion. We have had a career that has spanned academia, government, nonprofits. I'm really a committed activist always working for equity, social justice, and public service. You know, I often describe our Grinnell education as something that really is built on the pillars of public service and social justice. So I work at NASA right now, but I just came back from the White House. And at the White House, my official title was the Assistant Director for Research and Development Infrastructures in Science Equity. So in that role, I kind of had the oversight of all of this country's research and development infrastructures. And I worked on so many different things from looking at large constellations of satellites and spectrum issues to clean energy to fusion to looking at our scientific collections. Every day at the White House was like being in graduate school; somebody would come in with a new problem and say, 'hey, work on this.' And by the afternoon, you had to become an expert on that. And by evening, you're making decisions that will impact the country and the world. Right now, I'm really working quite a bit at the White House still (even though I don't go there physically every day) on clean energy, and specifically working on space-based solar power, and how to move the needle on that. I do a lot of work on advanced manufacturing and really using manufacturing to advance equity across the country. And then I do a lot of work right now in an interagency capacity building a human capital framework--human capital infrastructure framework that incorporates the values of inclusion, diversity, equity and accessibility across the US government for research and development infrastructures.

**Nicholas Lampietti** 05:13

Yeah, wow! That's--that's fantastic! You're--you're a busy man.

**Dr. Kartik Sheth** 05:17

It helps to not have any kids. Also, like, since I got to grad school the second time, I just have become laser focused on being as efficient as possible. And every step of my career, I've tried to become more and more efficient. I think Grinnell prepared me really well for that.

**Nicholas Lampietti** 05:36

Yeah, I'd love to talk a little bit about your time in Grinnell. Can you--can you tell us about your--your major, any activities, memorable stories, moments? Really sort of paint us a picture.

**Dr. Kartik Sheth** 05:49

So, I have to give you a little bit of context for Grinnell because, you know, I grew up in India in a relatively poor family, without a lot of conveniences. We never had a phone and didn't have a fridge, didn't have a bike, didn't have a car--like nothing, right? We didn't have a telephone at our house--so to give an idea. We immigrated when I was 14 to the country. And we came to America for a better life. My parents were in their 40s. But because we didn't have any money--my dad didn't have an American degree, my mom never finished college, didn't speak English well--we were immediately split apart. When I went to high school, this is before the internet was really available widely. And we didn't have any money to go visit any colleges. So I really selected Grinnell from a brochure. So I landed at Des Moines Airport, two bags packed and I did not know where the hell I was going in the middle of Iowa. My parents, in fact, never visited Grinnell until the day I graduated; they drove in a van across the country. My mom was so disappointed that the Grinnell diploma is that big, you know? Tiny, not a big diploma. My time at Grinnell was amazing. It was home. I felt stable for the first time; I loved it. Bunch of misfits from all over; people who felt like they didn't really fit in in their high schools all of a sudden got together at Grinnell and we all felt like 'oh my god, we found our community'. So I love that. My Grinnell friends are still my closest friends to date. And I think the thing that makes Grinnell Grinnell are the people. I didn't know what I wanted to major in; I kind of wanted to be an astronaut because I loved Star Trek growing up, but there is no astronomy and everybody at Grinnell told me, 'oh, you shouldn't do astronomy' You should really do physics.' So I started taking physics classes.

**Jane Hoffman** 07:31

We'd love to hear a little bit about your at-school experience. So what was your trajectory there?

**Dr. Kartik Sheth** 07:36

Yeah, so I think Grinnell gave me really poor career advice. And I really wanted to go to astronomy. And you know, we didn't have CLS at the time. So my professors at the time basically said you should apply to graduate school and apply to Midwestern schools. Grinnell is well known, you will have no problems. Not always the best advice. So I like most Grinnell students did really poorly on the physics GRE. The professors though said 'no, no Kartik, you should go to graduate school because you know, it's good to not take a break, you should just go.' But it was a horrible experience. I cannot tell you how bad it was. In fact, it was so bad that I almost dropped out. So it was an incredibly racist, sexist environment. It was so bad in fact that the students filed an EEOC complaint against--the against the department. I came down and Thanksgiving to the professors at Grinnell and I said, 'You didn't prepare me well; I'm failing my classes.' I had never failed in my life. I've never gotten less than a B+ in my life. And here I'm failing quantum, getting a D+ in--in classical mechanics, and I was ready to quit. And that was psychologically really difficult because my parents had just sacrificed everything in India. So for me to lay quit was really tough. So this is one good piece of advice the Grinnell faculty gave me, they said 'Kartik, you should--you should quit physics, not because you don't think you can do it, but because you don't like it anymore.' And I said, 'No--no, I like it.' And they said, 'Well, we think we prepared you well, you know, you should go back and give it another shot.' So I think I went back to Thanksgiving with a really renewed attitude. And it launched me on a parallel career path in diversity, equity and inclusion. I started a Women in Physics Series, I started dinky town dinners with faculty at University of Minnesota to open up lines of communication. And I developed an attitude that I really want to share with Grinnell students now is what I call a free agent mentality, especially if you're a woman, person of color, or a person from a historically excluded group trying to work in an area that is--that you technically you will walk in and you will feel like you don't belong. You have to develop the free agent mentality. I didn't know that--what it was it was called at the time but I developed it. It's the idea that you have to be able to look back at your life, know that you've always been okay and you've been successful, and that there is no reason for you to stay in a hostile environment or a toxic environment. You have to be able to say, 'I'll be okay, I'm gonna leave.' And so making that mindset change in my head saying, 'You know what, I'm gonna leave this. I'm gonna get straight A's, I'm gonna get past my quads, I'll get my masters, but I'm out of here.' That relieved the pressure from feeling like I had to work within the system. And so then I thrived; I figured out better ways, became more efficient, figured out better ways to study. So I passed my quads, I quadrupled my GRE scores. But a 44 percentile in--in physics, they were still terrible. And then I only applied to Maryland, Massachusetts, and Boston University because I decided if grad school is tough, it will be tough. I might as well be close to my family. So I go to Maryland and I really thrived. The advice somebody gave me is go to the biggest department because you will have many choices of what to do. And I just thrived. I knew at that point that I had to be the best student to come out of Maryland in the next 20 years, I finally started to understand what it meant to get a PhD and how to get you know--how to get a--get a job in a profession that is highly competitive. Only about 10% of astronomy PhDs get a job at a research-one institution and only about half actually stay in astronomy. You know, because there just aren't that many astronomy jobs. Outside of my time as an astronomy graduate student, I was also a sexual harassment prevention trainer for five and a half years at Maryland. And I did workshops all across Maryland. And that was really empowering because I was able to help create an environment that was better for everybody. And that's kind of--I've carried that through my diversity, equity, inclusion career my whole life. Yeah, I tried at Maryland--one of the things I've learned and I'd like to share with Grinnell students is, don't just think about having one advisor, one mentor. One of the things I did at Maryland was every time I had a new result or something, I would walk around the department and just share it with faculty members. Another thing I always tell students now that I didn't realize at the time is always work at the next level. So when you're an undergraduate, try to make friends with some graduate students and learn if your plan is to go to graduate school. So you can learn what it's like to be a graduate student and start to act like a graduate student because you can make mistakes without any penalty. So when you're a graduate student, act like a postdoc or you're a postdoc, act like a faculty member. You always have to think at the next level. I thrived at Maryland, realized 'oh, I'm not at a top tier graduate school so now I better go to a top tier program for my postdoc.' So I only applied to CalTech (which is the top school in the country), Berkeley, and Harvard. And I was like, 'if I can't get those, screw it, I'm gonna go do something else.' So again, that free agent mentality, but realizing 'I gotta do the right thing.' I ended up going to Caltech, and then I just really thrived in some of my best work. What I loved about CalTech was the color of my skin didn't matter as much as it has in most other places. They only cared about the work you did; it was highly competitive like a shark tank environment, but I loved it because I knew that all I had to do was be the best scientist I could be. My work has really been very meaningful--being able to commune with the stars, learn about galaxy evolution, galaxy formation. I was trained as a radio astronomer, so I studied nearby galaxies when I was at Maryland using a radio interferometer called Vemma, in Northern California at Caltech I worked on the Owens Valley Radio Observatory and helped build the Karma Array. But I started to transition to really using space-based telescopes and looking at galaxy evolution and galaxy formation. I would say I'm the world's expert in understanding how discs--galaxy discs like the Milky Way form, by using the presence or absence of a stellar bar in them as a signpost of cosmic evolution. The work that we published in 2008 is the seminal work in that field that shows the precise rate at which the Hubble sequence of galaxies came into existence over the last 7 billion years. And now 15 years later--now that we have the JWST--the James Webb Space Telescope, we can expand that work all the way to the beginning of time. It was a lot of fun, but my family said, 'You know Karthik, it's great that you live in California and you love it. But you know, if you want to move, the village is not moving to you. You need to move to the village.' And when my parents got to be 70 years old, I sort of felt like I need to move back East. I had been after my postdoc--after just one postdoc, I went on and got a job at the Spitzer Science Center, which is on the Caltech campus. When the Spitzer mission ran out of cryogen, I started thinking maybe I'll go back East. And like within a day, I was recruited, interviewed, and offered a job at the National Radio Astronomy Observatory, which is at UVA or the Charlottesville campus. There I had three different jobs; I was a Commissioning and Science Verification Liaison for the ALMA Array, I had my own research group, and I was doing observatory service work. But two and a half years living on and off in Chile building the ALMA Array. I built a new program in South Africa called Nine to try to build the next generation of scientists and engineers across the African continent. I also built a new program called NAC, which is the National Astronomy Consortium, which is a partnership in 17 Historically, Black Colleges and Universities, seven national majority universities, and three labs to bring more students of color into STEM. And so all of those efforts also translated to me being appointed to a new office: Office of Diversity and Inclusion at National Radio Astronomy Observatory. I was the first director for that. So it was a lot of fun. But every week, something bad happened to me or Aaron Evans (the other black colleague) and UVA was terrible, I just wanted to leave. And so I just waited till I got tenure and then I left. I applied to NASA and NSF. I just been on a national committee to lay out a vision for NASA astrophysics for the next 30 years. And that really made me think, 'Oh, I really love policy. I really think like thinking big picture. I really want to work on strategic thinking.' And so I came to NASA in 2015, 161 applications, I had no government experience; I'm really glad to be hired here. But one of the things I'd like to take the Grinnell--tell Grinnell students is to get jobs don't believe that your resume is gonna get you the job. That's very rarely the case. It's all about doing informational interviewing, networking with people, finding out and putting yourself in that zone of say, I'm now at this company or this organization; how do I see myself really thriving here, making those connections in the company, so people get to know you. And really doing that legwork so that before you even apply, the application you write is going to be strong; you've made the connections with people in the company. And NASA, I've been here four and a half years--for the first four and a half years I worked on astrophysics. I talked to you at the beginning; you know, we manage space programs, research and analysis, we do a lot of strategic thinking in laying out national policy for how astrophysics should proceed. But I got really bored, I'm like, 'I'm done. I'm done with astrophysics.' Really got worried about climate change. I was always already doing a lot of environmental justice in LA, in Pasadena. And so I switched over to earth science where I worked in applied sciences here, work managing a bunch of economists--I never took econ in my life. So we built a microeconomics framework for evaluation of societal benefits. Went to Abu Dhabi and realized, 'Wow, all this great work is going on with NASA, ESA, JAXA giving great data to people, but people aren't using it in the developing world.' I came back to NASA and I said, 'We need to do things differently.' They're like, 'We're not interested; go away.' So I ended up just starting my own nonprofit. My nonprofit is called Empowered Earth Alliance and we're very different than an NGO. What we try to do is work with people as thought consultants as catalysts to empower them with scientific, technical, business, policy, legal knowledge so that they can come up with their own solutions to their own problems in the areas of sustainability and climate change. And I really want to involve Grinnell students and Grinnell faculty and Grinnell alumni in this work going forward. So open invitation to anybody who's listening to this podcast to just contact me. And let's talk about how we can work on this together because this is the greatest crisis. We have 10 years maybe to take some real action because our kids and our kids' kids, they're not going to have a planet that they can live--live on if we don't do something.

**Jane Hoffman** 18:56

Given that you have held roles across academic, government, and nonprofit settings, I'd be really curious about some of the unique challenges and highlights of these different spheres.

**Dr. Kartik Sheth** 19:05

Yeah, I think the challenges are very different in each context and they have changed over time. I think a lot of immigrants and people of color are often very resilient to the cultures they end up in so that having a thick skin and being single minded really helped me overcome many of the challenges. In academia, my challenge was primarily--I didn't want to be an academic. There's a saying: academics fight so bitterly because they fight for so little. I hated that; I didn't want to be part of that. I'm really, truly a collaborative team-oriented person. However, the value system does not reward teamwork in most places, so that's a big challenge. And especially if you're an Asian American, your model minority myth that follows you is like, 'Oh, you're just a minion. You're gonna be help. You're not a leader, you're not a manager.' So that's one of the really difficult challenges that I've faced is that I always struggle to feel like people are going to allow me to lead teams and give me challenges. I mean, you look at my career and go, 'oh, he was so successful.' But I've always had to struggle to get at each place because compared to my colleagues, I often feel like I had to really prove myself and work twice as hard and have twice as many accomplishments to just get an equal opportunity. So that's tough. I think that's been--that's been--that's been a unique challenge. I think in the government, the unique challenge is inertia. And people say, 'Oh, we tried this five years ago, there's no reason to do it,' or all the government bureaucracy you hear of. But in some ways, it's also a fun challenge because you're--you have a stable job, you can innovate. And it's like, the challenge is, how do you build the right coalition? How do you socialize the problem correctly so that you can make the needle move? In my nonprofit, the challenge is how to go from volunteerism? How do I raise money? How do I keep people who are passionate, focused? How do we do the right kind of program management? So I think I've learned different skills from each of the different areas I've worked in. And I always try to bring the best of all of the different things. The thing I will tell Grinnell students is two things that have always worked for me is thinking about having charitable interpretation. So always think the best rather than the worst and being honest and have integrity. You know, just believe--you just--I--it sounds really trite and commonplace and cliche to say, you just kind of have to keep marching forward and keep doing the right things because there's no point in not doing that. James Baldwin said at an interview with Dick Cavett, when black people are being treated very poorly, Dick Cavett asked him I think, 'so are you are you a pessimist?' He said, 'No, I'm alive and therefore I'm an optimist.'

**Nicholas Lampietti** 22:05

We've talked a lot about diversity, equity, inclusion, and how it's, you know, influenced your story and the ways in which it's influenced your interactions with others. And I was wondering if you wanted to talk a little bit more about that, and sort of how that impacts the work you're currently doing, as well as sort of, you know, what's on the horizon, what projects you're excited to tackle, sort of where you see your work, and then the fields that you--you work in going.

**Dr. Kartik Sheth** 22:32

I think I don't have a choice as a brown person in America to think about diversity, equity and inclusion. Yet, I resent the fact that majority of the work falls on black and brown people to do. That's also true in the environmental sphere, the environmental movement has basically ignored black and brown people since it began. And yet the majority of the impacts of climate change are going to affect the global majority, the Global South. I'm really tired of people talking about pipelines. I'm really tired of people talking about, 'oh, let's just create opportunity. Let's just try to get more people into the pipeline, and magic will happen. All of a sudden world will become equitable in the future.' We'll be doing this forever since 1960s, at least since the Civil Rights Act, and inequity has only grown. So what--how do we do things differently? So one, I think we need intentionality. When it comes to diversity, equity and inclusion, and all of us have to be involved in it. Two, we have to be okay with the fact that to correct for historic inequities, we may have to tilt the playing field the other ways. Of course there will be a backlash for that. Research shows that there's good examples that when we tilt the playing field the other way intentionally, things become better in the long run for everybody. So I think that's a call to action for people to say we have to be intentional. The second thing I would say in diversity, equity inclusion I want is that representation matters. You know, we need to look at everything from the factory floor to the C suite. You can't just think about diversity at the--at the ground floor. But it also doesn't mean you put the token brown person in charge of your diversity office at the top. What we need to do is to intentionally change our senior leadership, create an environment where the people who are not from the majority organizations feel like they belong. From the people who are from historically excluded feel groups are empowered in leadership positions and their voices are heard. And then we need to make sure we understand that when that happens, people will naturally join the profession or endeavor that you're seeking to make more equitable and more inclusive. This is true also in academia in my field, when I was going through graduate school and beyond, departments intentionally created positions for women. Granted, it was mostly white women who got those positions, but today 42% of all PhDs in astronomy are--are women. That's incredible. So you know, we have to go for the common good that's long term and that's really hard for human beings. And that's very hard for equity inclusion efforts. So finally, I'll just say diversity, equity, inclusion, it's really really important to have leaders lead the way. You can't do this work at the grassroots, you will burn out, and even leaders will burn out. So we need to figure out ways to get those with power, really be intentional about identifying the problem, saying that they want to fix it, go beyond words and talk about actions that are measurable, implementable, sustainable, and then the most important thing, they have to tell their stakeholders hold me accountable for change. That's what we have to do to empower people and really make true change, like we're doing now at NASA. So at least two steps forward, one step back. So there are many days where I have to remind myself of the Baldwin quote, or Steven Biko's words to inspire myself to keep going, but it's hard. And so we have to also build horizontal networks to support each other. I think astronomy is great that way, right? Because I think one of the things you realize when you're an astronomer, is that we're just a speck of dust in the Milky Way and there are 100 to 400 billion such galaxies. And we don't even live long enough to even make a quarter of a circle around the Milky Way, right? Like we are--our life is so ephemeral. So my upbringing is in the Jain philosophy and one of the things that--one of the reasons you asked me before, you know, what--how do I do so much? Or why do I do so much? You know, I think it's because I carry my death in my hands at all times. It's a central principle in Jain philosophy. So if I know I'm going to die, and I could die tomorrow, then I want to live today to the fullest. I don't want to worry about what I did poorly yesterday. And I don't want to worry about what I may or may not be able to affect in the future. I just want to do everything I can today to the--to the best of my ability. And that's very freeing for me. And it's really kind of thanks to astronomy, also makes you realize how insignificant you are so we might as well make the best use of our time here.

**Jane Hoffman** 27:09

Making the best of your time here, whether that's on a campus, in the workplace, or in the Milky Way is surely something I'll be keeping in mind long after this episode concludes. Thanks for joining us today. This podcast is brought to you by the Center for Careers, Life, and Service at Grinnell College. This episode was produced by Jane Hoffman. Our executive producer is Katie Kriegel. Find us online at goingforthgrinnell.com. Follow us on Instagram or Facebook @goingforthpodcast. Listen to more episodes wherever you get your podcasts. See you next week.