January 15, 2021 - ExoGuide Talk

Ian Crossfield
Career Path

Tiffany:

Great. So you should have heard that this was going to be recorded. Welcome everyone. Thanks for making the time. As I said, this is the first time we're doing this Exoguide talk and round table discussions. So I'm sure we all have a lot to learn. But it's my pleasure today to introduce professor Ian Crossfield, I talked to Ian beforehand in terms of what sort of bio I should you introduce them, the normal career path, et cetera. And given that Ian's going to be talking about that today, I will just say, that Ian is currently a professor at the University of Kansas, and you'll learn more about his career path through Ian. So Ian, whenever you're ready, take it away.

Ian Crossfield:

Great. Thanks a bunch for that introduction, Tiffany, and really great to meet all of you out there. If I seem a little clunky giving this presentation, this is only the second time I've used Webex in about three years. Normally, I'm all Zoom all the time. But hopefully you can hear me.

Tiffany:

Yep. Sounds great.

Eileen:

That's a thumbs up.

Ian Crossfield:

Great. Good. Let's see. That's right. Like Tiffany said, I could probably feel like our whole two hour slot talking about the very convoluted and the random walking career trajectory I've had here. I'm not going to do that, but I am going to take a little bit more time, talking about that and then talk, the second half, in this, what I hope is going to be more of a discussion and less of a monologue, just talk about some of the general career lessons learned, that I think maybe I've picked up over the years.

As I go along with all this, don't hesitate at any time to jump in and ask a question. Maybe I'll see if you raise hands or something, but also maybe I won't. As far as I'm concerned, you can just jump in and if you don't want to jump in, raise a hand or there's probably a chat feature somewhere, so you can use that too.

Tiffany:

Feel free to put it in the chat, use the raise hand tool. Some of the co-hosts can see that including Rob, myself, Vanessa. But yeah, feel free to shout out. Continue Ian.

Ian Crossfield:

Great. Listen, I wanted to start out first, just talking a little bit about the career trajectory that I've come along. Because it sounded like, all of you there are ranging from first-year graduate students up to, at

least, a few year post-docs. And I was actually pleasantly surprised that I've met a couple of you before already, not just David, but it's great to get the chance to meet the rest of you as well.

The stereotypical career trajectory in our field, right? Is, you go to graduate school, you do a postdoc or two, you get an academic job, where you work at a research center or a NAFA somewhere, and, then that's basically it. And there's a couple of steps, and each transition is pretty stressful to be sure, but it's a pretty straightforward and logical path. But in reality, as many of you I bet already know, it doesn't always work quite that way. It didn't quite work that way for me here either, and so I wanted to just go through that trajectory.

After I finished my undergraduate degree, which was in physics down in Southern California, I wasn't sure whether I wanted to actually go to graduate school or not, which I think is the case for at least a few of you as well. And so, instead, I wasn't sure, like I said, what I wanted to do, so I went around applying for jobs in the area and I was very fortunate and was able to get a, just as a bachelor's degree student, get a job doing optical engineering over at JPL, where a lot of your organizers there are located. I have hunted around and I actually still have my old JPL name badge holder. These are big status symbols when you're on JPL. At least when I was there, the more pins you had on this thing, the higher ranking in the hierarchy you were. The current JPLers can confirm if that's still the case or not.

So I didn't actually go straight into science, and so, I started out actually doing engineering work, instead. And is there anyone on the line, I mean, among the ExoExplorers ... I didn't sound like there's anyone doing instrumentation specifically, or is someone?

Doug:

Jules does, but they're not on the call.

Speaker 5:

And so do I, [inaudible 00:04:44].

Ian Crossfield:

Great. For those of you who do instrumentation or have worked somewhat in the past, there's similarities and there's differences between building instruments or designing facilities and actually doing science with them. And so, that was something I had pretty limited experience with before I got there. But I spent a couple of years, at JPL, working on, in retrospect, what seemed like variously ill-fated projects. I spent a lot of time working on early optical design for the 30 meter telescope project. I think I still have some old papers and binders that talk about, when it sees first light in 2011, all of the great science it's going to do. And of course, we all know it's gone nowhere fast ever since then.

Another one I have the chance to work on was a project called SIM, which was an acronym for the Space Interferometry Mission. Now some of you are looking confused, like you've never heard of it. And that's because, SIM was an archetype or an example of what can go really well for a mission and then still at the end go really wrong. It was a mission that had two consecutive decatal surveys. It was the number one ranked flagship mission, top priority for NASA. We have to build this mission. It would be a super focused ultra precise Gaia, doing very precise astrometry of stars all over the sky.

Well, and so, we worked on it a bunch, and then, in the third consecutive decatal survey, it was just a footnote, saying, "We don't think we need SIM anymore." And that pulled the plug on the whole project pretty quickly. Luckily, I can't claim any great foresight, but I had actually already been applying to graduate school, a year or two before that news came in. Because I was starting to feel like I would rather ... Because I think most of you feel, that I'd rather be using these instruments and facilities rather

than just designing them for other people to use." And I really had the impression that, if you want to be one of the people using these things, you have to actually go and get your PhD. As you all are doing or have done.

I mean, as far as graduate school goes, you all succeeded in that, obviously, I only pulled through it by the skin of my teeth. So despite spending a couple of years working at NASA, I was only accepted to one graduate school. And so, if that had been zero, instead of one, I guess my path would have been very different. I wouldn't have been here talking to you. But I got into a program, started working with someone, quickly changed advisors to do something else and got in the field of, studying exoplanets, which I had been leaning toward already at my JPL times. But really sunk my teeth into in graduate school, like y'all are doing.

And so, I spent the next couple of years there at UCLA, in grad school, working on transits, eclipses, phase curves, mainly short period planets. Familiar stuff to a lot of you though. Luckily the planets we have to be the observational targets are a lot more favorable now than the ones we were looking at back then. So thanks to tasks and capital and all the rest of those missions. So first, I took a couple years off, which I think some of you also did before graduate school. But then, in grad school I did the other big thing that I think, as much as anything else, set me on a slightly less typical trajectory than normal, which was, marrying another astronomer.

And so, my spouse and I are both professional astronomers, we still are, and we've managed to hang together for, I guess, over 10 years at this point now. And we're both still in the field and some of you I think have heard the phrase before, "The two-body problem." There's the famous sci-fi book, The Three-Body Problem. Well, the two-body problem, right? It's just you and your significant other are both astronomers and that's exponentially more interesting to make work in a career sense, than just having one of you.

The other mistake maybe was me finishing up my degree a year before my spouse did, but that was what we did. I started my post-doc at, my first post-doc, because I did, depending how you count it, two or three, at the Max Planck Institute for Astronomy out in Germany. I guess I was thinking, as you all were introducing yourselves, the ExoExplorers group here is a very diverse and representative group. I guess the one group we're not representing are astronomers who have chosen to not work in the United States. But maybe that's a necessary condition, I guess. Some of you are still students and you might think about working in other countries later in the future. And I will say, I got a fair bit of advice against going abroad to work as a postdoc. I had a number of people, I remember, telling me, "If you do this, then, everyone in the United States will forget about you and if you want to come back for a job, no one will be interested in hiring you anymore. And you'll just making it that much more difficult on yourself."

And I mean, every one person is just an anecdote, so I don't know if overall maybe there's truth to that or not. But I certainly found ... I mean, obviously I stayed in astronomy, so I guess it worked out for me. And on the other hand, I felt like there was a lot of very educational eye-opening experiences, involved in going to work abroad, that I wouldn't have gotten had I stayed in the country, I guess. And so, it's tough. Unless you are going to like England or Australia or something like that, in astronomy, it's tough for me to think of a place that would be a smoother transition than the United States to Germany.

When they speak a different language, technically, but as soon as they sense that an American is near, even if it's just two Germans talking, they'll switch to English. So it's actually very difficult to try to improve your German while you're living over there because people were so conscientious about trying to make it easier for folks. At the Institute. I mean, if you're in town it's a little different.

So it was nice because it was just a chance to really, explore and experience a different culture, a different place, different ways of doing things and to meet fundamentally, different people that you

would never have interacted with professionally, otherwise, except at, one conference every couple of years. So some of my collaborators now, I mean, going on, I guess, eight years later, are still these people I met from my postdoc abroad. I would say, the nice thing about doing a post-doc abroad or anywhere is that, postdoc is maybe the one job in your life where, you're sure, you're pretty sure, that it doesn't have to be long-term, there's a definite end date.

No that's a scary thing, when you're a postdoc, because it ends soon. Then the other hand, it's a low risk way to try something very different, where you might be a lot more hesitant in trying it for a permanent position. And anyway, there's a lot of good things about going somewhere new and trying something different. So it worked for me anyway. I will say one of the other things that was, aside from meeting lots of people and getting access to new observing facilities, which I enjoyed, another big advantage or I think maybe one of the most important things I learned when I was there was, European astronomers, specifically, are way better at taking personal time off, than American astronomers. Learn from their example.

So I know many of my peers, young professors, old professors, people will talk about, if you want to succeed in this field, you have to work 60, 70, 80 hours a week, somehow, stay up late all the night. And if you enjoy doing all astronomy all the time, that is fine, there was nothing wrong with that if you like it. But the point is, if you also want to have a life, you don't have to do that. And I feel like there's definitely more of a culture ... In my opinion, what I've seen, there's more of a culture, maybe not toward burnout exactly, but definitely toward ... I don't know, a culture of ... It's a matter of pride to be too busy and to be too overworked. I think it was better, I felt a little bit better about that over in Europe.

Let's see. The work I spent doing over in Germany for a couple of years, the other nice thing about a postdoc was, when you're a student, especially, there's all sorts of thesis right? There's the thesis where you staple three or four or five totally unrelated papers together, and that's your thesis. There's a thesis where you laser focused on one particular topic, and you just worked on that for your dissertation. But I think whichever it is, the nice thing about a post-doc, aside from a way to try a place that's new, is a way to start expanding beyond your initial graduate school comfort zone of research.

So it's fine to build on what you know before, but I think it's also a good opportunity to be ... You're learning new skills, techniques, different science cases. And so, I only worked on exoplanets before, I got more into the brown dwarf game when I was out there in Germany, for a couple of years. And so that was interesting and navel working, studying there, studying brown dwarf weather patterns through high resolution spectroscopy, like some people have talked about here. Maybe we don't have any brown dwarf people on the call either.

Eileen:

We do indeed, I think so.

Ian Crossfield:

Oh, sorry.

Eileen:

Eileen's done all that.

Ian Crossfield:

Sorry about that.

Eileen:

No worries.

Ian Crossfield:

Sorry Eileen. You did say that, brown dwarfs and Exoplanets. Too much for me to take in. Great. Brown dwarfs for life. After that, this whole time, I was, as one does, as those of you who are postdocs already know, every year, if you're prancing in the field ... Basically every year once you're a postdoc, you're starting to put in your applications for permanent positions. And so, I was doing this periodically, but, not getting permanent positions yet, so one, I also applied for other post-docs. And one of the fellowships, which is still around, which I applied for, was the Sagan Fellowship. The program is slightly different now, it's wrapped up with the Hubble and Sagan meshed together. They were a little bit more separate, but not too much has changed now. But I was lucky enough to get one of these Sagan positions.

And so, to a lot of you who are grad students who, when you're applying to these positions in a couple of years, Sagan Fellowships would definitely be high on your list of possible things you are interested in applying for. I went through and dug up just a few metrics, on the people who've gotten Sagan Fellowships in the last couple of years. I just went through fairly quickly. I was just looking at, when did people actually get their PhD, versus when did they get a Sagan Fellowship? And what are their citation metrics like? So we all know there's a lot more to life than citation metrics, but I'm only one man with limited time. So I can only look up so much on all of these people.

So I thought it was interesting that, only something like two thirds of the Sagan Fellows in the last couple of years, are applying in the year of their PhD. They're applying in the year when they're graduating. And so, that suggests to me probably that, there must be some first mover advantage, so to speak. That maybe there's a little bit ... Maybe the process, for whatever reason, gives a little bit of advantage to people applying right out of grad school. Maybe that's part of the selection criteria. I haven't been part of the selection. But certainly, that means there's still plenty of people who are senior postdocs, like I was, who'll also apply later on and still have a chance to get it.

I was looking at these people's h-index as well, the h-index is one of the metrics of citations. It's like, if you have 10 papers but your fifth paper has five citations, and all the others have less than that, your h-index is five, even though you wrote 10 papers. The other five haven't really had a chance to contributed in a large way, to the field of the way it goes. Well, the h-index of these people getting Sagan Fellowships, who are many of your soon to be peers, ranges from as high as 15, which is, that person should have been given a faculty position already, I think, to zero.

So there are people who get a Sagan Fellowship but when they applied, they had no citations to their papers, or maybe they had no referee papers published yet. So the median is six, so it suggests, generally people do have some papers out there already. But it also goes to say that, although you should be doing good science, even if you haven't gotten some good results out yet, it's still possible, I think, to be very successful, and still get these fellowships. Because people are getting these with no citations at all. Which surprised me a little bit, but should be heartening to anyone who worries about their citation count. Because if you've got zero, well, then, you're in good company and if you have more than zero, then you're already better than these people. So either way you're coming out ahead.

And their number of citations also ranges from, as high as a thousand, if you include all of the papers they were co-authors on, I think they're like, someone who is a co-author on one of the Gaia papers or something like that, to as low as zero, again. So, again, just goes to show that, anyone in principle can get these fellowships, which, you know? And if you do, so much the better, and if you don't, plenty of people who don't also get through just fine.

So as a postdoc back in the United States now on the Sagan Fellowship, I was back in the United States academic ecosystem where I was planning on staying. And so, this was also the time when I started to apply more regularly for these big funding and grant opportunities. And not just for telescope time, which, for an observer like me, is a big deal, but also just general purpose grants. From places like NASA, from NSF, a few other agencies, and this gave me the chance to build new skills up, that I didn't have yet. One of the common pieces of advice I hear given, I guess I'll pass it on to you is, you should always be acting, not acting like faking, but developing the skills and exhibiting the traits of whatever is the next position up in the hierarchy that you're hoping to get.

If you're a grad student, you want to be thinking about, "When I'm a postdoc, what are the skills I'm going to need to be using? Can I start to develop and exhibit those now?" It goes even more, I think for, once you're a postdoc trying to be a faculty member. And so, I at least hoped, I don't have any way of knowing for sure, but I at least hoped that having secured a couple of these grants from various sources, looks good to people who might want to hire me someday. And it also, in the meantime, even if they didn't care about it at all, once you have your own money, then you're much more in the position to be your own boss. And most of our dreams is academics.

A lot of us don't take well to hierarchies or being told what to do. We like our flexibility, we like being able to work on what we want at the pace we want. And if you have some sort of prize fellowship, or if you're bringing in your own grants, that's when you're your own boss more than any other time. And so, if you want to work with students and mentor students, from anywhere in the country, then, you can do that, if you've got the money to fund them. So I was working in Arizona, I worked with some students there in Arizona. I also worked with a couple of students from the Los Angeles area, who came out from the summer and worked with me there.

The point is, if you've got your money, then you can, within reason, do whatever you want. Do you want to travel to 10 conferences in a year? You can do that too. That wasn't my cup of tea. Some people like that. So I would say, once you're a year or two into your postdoc, and there are opportunities for this if you're grad student too. Though those are more of the student fellowship like the NSF Fellowship or the NASA Finest Fellowships. Apply for these things, really, as often as you can, until you've got more on your hands than you can manage.

The beauty of writing any application, right? Is once it's written, even if it doesn't succeed, it means the next year you can put it in again, and maybe you could even write a second one. And so, your probability of success is arithmetically increasing over time, so the earlier you start the better. That was my experience. Another thing that I learned in retrospect, looking back at my time as a postdoc, which I wish someone had just come right out and told me, was, if there are people at your institution that you want to work with, go seek them out. You have to take the bull by the horns and actively go seek them out. Now, of course, none of us can actually meet in person, but you can still send them emails or find them at department virtual events.

But there's sometimes a tendency too in astronomy, maybe this goes with, all of us wanting to be our own bosses, we hope, "I'll just put my head down, work hard, do great science, and eventually, if I do great science, everyone will recognize me for that. And then the people I want to work with, they will have noticed me. And I don't want to put myself in their way. I don't want to bother them because they probably have more important things to do than talk with little old me." That's how I treated some of my time as a postdoc.

And in retrospect, these people, they're not ... It's not like some Jane Austin book where there or like Brigderton, which is the hot show lately, where they're all casting long and glances across the room at new people, hoping that maybe this new person, this new postdoc or student, wants to work with me. No, they've got their hands full, so your only chance is to just be upfront with them and say,

"I'd be interested in just attending your group meetings or starting a collaboration with you, or just chatting half an hour every two weeks. But if there are people you want to work with and meet with, you really almost can't be too direct about it. And sometimes maybe they'll say, no, but at least then, you can move on, and at least. It's disappointing but then you at least don't have to worry about it anymore.

And then, at least you won't have the regret that you didn't ask them about it. So seize those opportunities, apply for grants if they're available, apply for resources and telescope time, go out and just try to meet the people and work with the people you want to work with. Even if they're not at your institution. Well, actually, when I was a graduate student, we had access to this little dinky one meter telescope, but it was enough ... A one meter telescope is enough to observe transits. And so I reached out to some of the people doing just general transit follow-up and said, "You don't know me from Adam, but I have access to this telescope we know how to use, I'd be happy to contribute." And especially if you have a resource, these people are probably not going to say, they don't want free support for their own research efforts. And so, it's a way for you to learn and for you to network and meet new people and they get help to win-win all around. But you have to actively seek these opportunities out and make them happen for yourself.

And it's just a final note on that, I mean, as you continue in your career, the same also goes for things like ... If you go to AAF though, it has the prize lectures and various people being recognized by the society for their contributions. Well, again, it's not like those people were just sitting around thinking themselves great and waiting to be recognized, someone is nominating them. And it's totally socially acceptable to ask someone to nominate you, if you think you're particularly eligible for one of these positions. That's not something I've ever done. I've also never won any AAF prizes and so, I understand that, maybe not everyone, but many of the people who get these things, did, at some time or other, ask someone to nominate them for these things.

So again, just go out and put yourself forward, as much as you can, even if it's the second most awkward feeling thing ever, in astronomy. First most awkward thing for any of us, right? Is writing graduate school and job applications where we have to sell ourselves, like we're worth a million bucks. Even if you don't feel that way or believe it about yourself, but you still have to do it, because everyone else is doing it too. So continuing that narrative, although I had come back to the United States for the last couple of years, my spouse and I were not living in the same ... Not in the same place, not in the same time zone, not even on the same continent. So we definitely did the long distance relationship thing.

We had both gone to Germany, then my spouse had come back to the United States. So we were separated by, like seven or eight hours of time zone difference. And then, I came back to the United States a year after that, but two different States. So at least we were on the same continent, but still separated. And then, we did this seesaw tug of war, back and forth where each of us, pulled the other toward a new location. It felt like every year or two for the next couple of years. So my spouse then moved to Arizona to be with me. Well, a year after that, my spouse got a faculty job in San Jose, California. And so, both of us went out to the California Bay Area.

And we were there for a year and then I got a job out in Massachusetts, and so, we talked this over a lot. But ultimately, both of us left California and headed out 3000 miles to the other side of the country, and we worked there for a couple of years. And then, about a year and a half or so ago, my spouse got a job here in Kansas, essentially permanent long-term job, and we talked about it some more and then I gave up my job and then we both came up here. And so, there was a lot of this, you either spend time apart or someone has to compromise, or you both have to mutually agree on exactly what it is you want.

So some of you are single, some of you probably ... Most of you are not in relationships with astronomers. If you are, that's great. If you're not, I'm sure there are advantages too, so I hear. But regardless the point is, you're probably going to have to make these compromises if you haven't already done. But, I think it's fair to say that, most people don't move as many times as we did, which I think was, like six or seven different moves in not too many more years. So you can definitely do better than that.

My last thing on that narrative of my trajectory to finally getting here, so I moved here to Kansas, just a couple of months, just in time for the great pandemic to hit. So I've spent far more time working from this office space that you see here, than I ever have from any office on the campus here. And I barely even know most of my colleagues. But I will say on faculty applications, when you get to the point, whether you're applying to be a professor somewhere, or to be a GPL or other NASA scientist, or you work at an observatory somewhere, just getting to grad school and just getting to be a postdoc, you have to put in lots of applications. Just like for these grant applications as well.

And so, I went through my old folders here on my hard drive before this talk, and I guess that I applied for, over the course of my career, 60, six zero faculty positions, permanent positions. A couple of those weren't professors, but most of them were. Of those 60 applications, I was never the top choice at any institution. So I had a number of interviews, and there's plenty to be said about interviewing too, I guess, and I was second choice for a couple of places, but I was never anyone's top choice. And yet, I'm now in my second academic job and I have every expectation, unless the economy craters, of being in this till the end of my career, if not until the end of my days, I guess.

So you have to do a lot of these applications for any of these, basically, for anything you want to get an astronomy. There's always just more demand than there is supply. And all that means, again, is you just have to make the numerical advantage, work in your favor as much as you can. And just put in lots of proposals, lots of applications, lots of requests, for these things. And the more you do, the more you're increasing your chances.

So what are the lessons learned from this bouncy ball career trajectory that I've been talking about? One that I don't think it's emphasized as much as it might is, I think, communication is really a key skill that's very essential, and maybe that's sometimes recognized, but there's not a lot really done to develop it. I mean, communication, not just in terms of slideshows and talks, but also in terms of written communication as well. For getting a postdoc, for getting a job, the number one thing that gets your foot in that door, is your written application. Unless it's application for some of these NASA centers where, your whole application is gatekeepered by an automatic keyword checking algorithm. But talk to people at the NASA centers, once you start applying for those things.

But most of the time it's read by a human and it's really essential to be clearly communicating what it is you want. And so, if you're already a great communicator, terrific, if you feel like, that's something you could still have make more progress on, then, any institution, any big university, at least, has writing center people who may be useful or may not be very useful. But you've always got your peers and you've always got your fellow ExoExplorers or any of us Exo guys, or any of the organizers, I'm sure. If you're a year or two down the line applying for some position, and you can't find anyone else to give you feedback, "Does this look well written and well crafted or does it still need a lot of help?" Send it to me or Tiffany or Rob or any of these other people, and we, if no one else, we'll certainly be glad to help you out.

The more sets of independent eyes that are looking at your application materials, the better the chance that you'll catch whatever weaknesses might be there, and just tighten it up and improve it as much as you can. Because if the number one goal is just, quantity over quality, apply as many times as you can. I think number two, unfortunately, is quality over quantity. You also have to make each one of

them really good as well. And so, you have to do both, but you can't write well without practice and without getting feedback on these things. Even if it feels like everyone else is busy and probably have more important things to do, that's not a good sign that you should ask them or not. Because, people out there who are happy to help you, someone is.

I already talked about, apply for everything you can, until you have too much. Apply for that grant funding, so that you can do whatever you need with it, apply for that telescope time. If you've gotten time in the last three semesters on your telescope, but you haven't published anything with it, maybe don't apply. But, if you've got one semester and you haven't published it yet, I would say, it's probably worth keeping applying. It's always better to have more data than not enough, whether it's for yourself or for those students, you're going to fund with the grants or fellowships you bring in, at some point.

Along with communication, something else that I hear talked about a lot of professional development, but I think is more important than we give it credit for is, doing service for the astronomical community, for the science community. And so, maybe as a student, maybe there aren't a lot of opportunities yet to contribute to the society, but there are usually some ways. Like you could ... I forget. I think that, even as a graduate student, you can be a judge for some of the poster awards at the AAF, for example. So that's an easy service. There's the people like the AstroBytes crowd who are writing these easily digestible articles about recent science things.

There's various committees in your department maybe that you can contribute to, to help improve the climate or help admit new graduate students. Or some departments are even so enlightened that for the faculty hiring committees, there's a student or a postdoc on them to just learn how the process goes and provide some extra input. But I think if you're only doing science and you're never doing service, and probably saying this to the ExoExplorer is less necessary than to a lot of other groups, then I think you're missing the boat a little bit.

When I write a rubric for admitting a graduate student or hiring a postdoc, I at least always have service to the community. And maybe that's outreach, but usually it's more than just outreach. I think a large and increasing number of people include this as a criteria as well. So it's good for you, it's good for the community, it's good for whatever institution you're part of and helping out. So I think do that to every kiddo.

One controversial thing but that I feel is a little bit true, unfortunately, and so we might as well, voice an unfortunate truth rather than ignore it, I guess, is that, who you know in astronomy matters. Maybe some of us, at least, at various times have helped, that we all as great rational scientists, can just totally divorce all of human experience from what happens. And so, it's some perfect meritocracy, but I think we know these days that that's really not so much the case. And so, you have to be doing great science and doing great service and communicating great. But also, if nobody knows who you are at the end of the day, it's just going to be that much harder to get your foot in whatever door you're trying to get into.

And so, I think the corollary of this is, network, network network. So you meet people at conferences, you meet ... No one likes virtual conferences for meeting people. You go to any of the booths, the virtual booth, set at AAF meeting, and if you did that, and you ask them, "How many people have come by today?" And they'll be like, "Two people." So next year I think this will be a lot better off. But even now, seize the opportunity to network when you can. The people who are junior to you, like the undergraduates or the young starting graduate students, well, you might be hiring them, five or 10 years down the road. And so, you might as well know now. Get to know them now, either see what they're doing and maybe you can help them out or not help them out.

And the people who are your peers, right? You're going to be going through all of this together. So you're competing with the people in your peer group, but you also have to be supporting each other because, if you don't support each other in your own peer group, well, nobody else probably will. So you have to start somewhere. And of course, you have to network with the people who are elder to you, who've been in the field longer, because they, sooner or later, they're going to be hiring you. And so, if they don't know who you are, then again, it's going to be that much tougher to get them to hire you wherever you are.

And so, some of you are lucky to be at big institutions, with lots of people, with lots of practical and moral support. You'll give a talk at a conference and if no one else asks the question, there'll be someone from your institution in the audience to raise their hand and ask a question. That person can feel like a lifesaver. Some of you might not have that support mechanism, but you need to know that, some people out there have it, and so you need to find a way to build something, either similar or serving an equivalent purpose for yourself, so you're still getting the benefit of this. And our ExoExplorers group here is as good a framework, as any maybe, for building that up. But networking is really essential.

And, again, there's this, name recognition matters as well. So if people a few years down the road, recognize your name, that pays big dividends, as long as they recognize it for good reason, I guess. I guess, the only last thing I'd say on that part is, as far as getting this name recognition, it's tough to get feedback during the job application process, but you can get a little sometimes. And so what little I was able to get, both from my own experiences and from those of other people, is that, if you're trying to get a job, especially at a permanent, at least, academic professorial job, if all things being equal, you're probably better off being thought of as an expert in one area, rather than a Jack of all trades, Swiss army knife, who can do 10 different things, but you're not known as the person for any of it.

So I don't think that's always true, but if you ... I think more often than not, maybe that's good advice to follow. So think about that as well. And finally, the last item I had written down here on my list is, on top of all of this, of course, you have to do great, meaningful, impactful science. And that's really, at the end of the day, why we're all actually here, but ... And so, I really haven't talked much about that in this past hour, but I feel like, everyone talks about doing science, and that's what 80% of graduate school focuses on, at least in my experience. And there's a lot more to it than that as well, but you also have to be doing good science. And if you're doing good science and getting your results out there and working in collaborations, then that's another way, really, that you're networking and building your brand, getting your name recognition out there, in the longer term.

And so, I'm not saying that, every time you write a paper, you need to stage a press release, that you discovered a new transiting planet or something, or you discovered water on the moon again, right? Or like water on Mars, this happens every three years and there's a big press release. But if you have a real impactful result, don't hold back and definitely seek out the extra attention that a press release, even if it's just from your own institution or from wider, that provides you as well.

So that's, I think, most of what I wanted to say about all of this, I don't really have any other big tips that come to mind, but I'm certainly happy to take plenty of questions from folks. And I'm happy to hear if some people have challenges or maybe you didn't think I didn't get everything right in my enumeration here, I'm happy to hear that too. The scientific method at work. So I think I'll leave it there, and happy to take questions and/or move into the question and answer period, however you all think best.

Tiffany:

All right. Thanks Ian. Maybe if we can unmute ourselves and give a brief round of applause for the ... At this point, we can enter in the Q&A round table discussion segment. Oh, hey Doug. I see you're on there too. I think at this point, I mean, unless the, us organizing folk we're chatting about, whether or not you want us to stay on for this discussion. I mean, I want to give you all the opportunity to ask as unfiltered questions as you'd like. And so, Robinson will stay on as moderator. I have to dial off for a 1:00 PM meeting myself. But, do you guys have any strong feelings for us staying on or off? I mean, we want to give you guys as much latitude to talk with Ian as possible.

Eileen:

It's fine with me if y'all want to stay, but it's also fine if you don't want to.

Tiffany:

Well, I can certainly hop back on in a half hour. I think Rob is certainly capable of handling any technical issues that that might arise.

Rob:

Do you want this Q&A session recorded as well Tiff or you want me to stop recording?

Tiffany:

No, I think we agreed to just keep it not recorded.

Rob:

All right. I will stop then.

Tiffany:

Okay.