

AT: Welcome to the Infinite Women podcast. I'm your host, Allison Tyra. And today I'm joined by Dr. Ides Wong, a program manager at CSIRO, to talk about astronomer, mathematician and poet, Wang Zhenyi.

IW: She's a bit of a multi amazing person. So she's, as you said, an astronomer, she's also a mathematician, she is also a famous poet, wrote poems that are actually really, really quite beautiful and quite pointed about society in general, as well. And if you read about her story, I think she's also very good at hunting. She's excellent at horseback riding, and hunting while horseback riding, which I'm not good at, at all, or know how to. I think it's amazing. It seems like she would just go to a new environment, pick up things that she doesn't know, and become good at it.

AT: And she was doing all of this in 1700s China, so not a time when women were necessarily encouraged to pursue all of those incredible activities that you were talking about.

IW: Absolutely, not, perhaps, sometimes in modern day as well, we're also not encouraged to do a lot of the things.

AT: But she was fortunate to have a family that supported her education, which obviously wasn't necessarily a priority for girls of that time. So, her grandfather taught her astronomy, her grandmother taught her poetry, which I feel like the poetry would have been a little more acceptable for girls at that time.

IW: Yes.

AT: And her dad was teaching her, you know, medicine and geography and mathematics, which was definitely not as common, shall we say, and as socially acceptable. And the equestrian skills, the archery in the martial arts that you mentioned, I believe she learned those from the wife of a Mongolian General.

IW: Correct. Which is probably also not very common, anywhere, anytime.

AT: So she was really lucky to have all of that support and interesting people who were willing to teach her in those early years. But I believe one of the things that she's best known for is her achievements in astronomy. So do you want to tell us a bit about that?

IW: I think in astronomy, she was doing quite a lot of research in astronomy. She's developed her own principles in astronomy, I'm not an astronomer, just so I can't attain to how amazing it was. But from all accounts, it was very groundbreaking things. But what struck me most is also she wasn't just developing new theories, a new principles and new knowledge. One of her big thing, particularly in mathematics, it's about she research about mathematics, understand it, and then made it her mission to write books to make it more accessible to people in language that other people can understand, which apparently at those times, is groundbreaking. And that really resonated with me.

AT: And so she, she mastered trigonometry, she knew the Pythagorean theorem, she apparently wrote an article called The Explanation of the Pythagorean Theorem and Trigonometry, where she described a triangle and the relationship between the shorter leg and the long leg and all of that fun stuff. And she also really loved a book called The Principles of Calculation and rewrote it in simpler language. So this is what you were talking about, to make it more accessible to other people. And she was able to simplify multiplication and division, just to make it more comprehensible, and wrote a book called The Simple Principles of Calculation when she was just 24.

IW: Yes, that's incredible. And I think, to me when I was reading about it, and something about how, she's clearly extremely intelligent, right? She can understand it herself. But realized that other people might want to understand it too. And other people who may not be as privileged, may not have those background education, could benefit from it. And so that's something to me was quite unusual, and it really struck a chord with me.

AT: And it is interesting that as we know that she did have a lot of these privileges, her poetry as well also was often about the hard lives of common people, especially women. She talked about corruption and highlighted the difference between how social classes live. So she was very much aware that she was fortunate and wanted to make all of this accessible to people who didn't have her privileges.

IW: Yeah, I think that level of self awareness, and I can't help but when I was reading it, there's a gentleness, about her skills and how she goes about it that I really admire.

AT: So we were saying that she was doing all of this when she was in her 20s, because she actually died when she was only 29. And we don't actually know why, we don't know what killed her.

IW: Yeah, unfortunately, it's commonplace, at those times, right? It could be a range of illnesses. It could be even your garden variety cold and flu. It could be genetic predisposition, it could be something that she ate, so nothing was really written about it. And it's just this kind of tragic character that just died so young. And I couldn't help but imagine the kind of things that she could achieve in her later life, and how would she go about it? One thing that I was reading through it as well, I found it really intriguing is, how was she managed with the family, having a family and growing into the different roles, into motherhood? And, maybe grandmotherhood, for example, how would that look like. I just couldn't help but wonder someone like that, you know, if we could just know more, and that would be amazing.

AT: And we are lucky that she loved so much of her writing behind. So like on the astronomy side, she described her views of celestial phenomena in an article called The Dispute of the Procession of the Equinoxes. And she was able to actually explain simply how equinoxes move and calculate that movement. And she wrote all these other articles on stuff that I'm guessing neither of us really understands.

IW: Yep, it was completely lost on me. It sounds beautiful.

AT: And I'm sure it was beautifully written. And we are also fortunate that whatever the cause of her death, she apparently knew that she was dying, because she gave all of her work to her best friend, Madame Kuai, who then pass them on to her nephew, who was a famous scholar. He compiled everything, published it, and presumably, with his reputation, was able to get it publicized as well, like, make sure that everyone knew about it. But it is one of those stories that reminds me just how easily someone's legacy can be lost if there aren't people who care enough to preserve and promote their work. Like she could have just been lost to history, and we never would have known about her at all.

IW: Oh, totally. And as I was doing research for this podcast, it actually wasn't easy to find her work and her life story, too, you know, it took quite a bit of digging. So I can just imagine the number of people and their works would have been lost. If if they weren't as loved as Zhenyi. Because I think reading through that story, I don't know if you got that, she seemed to be quite a well-loved character. You know, wherever she goes, she would connect with someone, she would then learn a new skill, and people were really taken to her work to document it. So I can't help but think that maybe she's also a really wonderful human being and a good friend.

AT: I mean, she's certainly an interesting person in the sense that, she does love to learn, she's interested in other people's lives and situations. As we were talking about earlier, she loves knowledge, and she cares about other people and wants to share that knowledge with them. Which, I think that that is a very lovable quality.

IW: Yeah, she did definitely strikes me as someone who has a lot of empathy.

AT: And she was also quite bold for the time, not just in the fact that she is pursuing all of these things that go against social norms. But her writing also indicates that she believed in equal opportunity for men and women. So she wrote that when talking about learning and sciences, people thought of no women, complained that people thought women should only do cooking and sewing and they should not be bothered about writing articles for publications, studying history, composing poetry, or doing calligraphy, and saying, you know, we are all people who have the same reason for studying. So I don't know if she would have described herself as a feminist, but she certainly sounds like one to me.

IW: Yes, absolutely. I agree with that, too. I think how often that even now we have those thoughts. But we may not put that in writing in such a public way, or if we do, we often think about the consequences of someone picking this up and interpreting it. And think of who we are as a result and care about, what would that do to our self image and all those considerations. For someone at that time, be brave enough put to put that into works like that. I just have so much admiration.

AT: You chose her as the person that you wanted to talk about. So out of all the many wonderful women that you could have been interested in, what about her really resonated with you personally?

IW: There are so many wonderful women, I did a lot of research into all the amazing women. And so thank you for the opportunity to do the podcast, where I actually went to do a lot of research and learn about a lot of amazing women doing really amazing things. What struck me about Zhenyi is that, first of all, I really wanted to pick a scientist, that is of my cultural background. And I felt that was important, not necessarily Asian, but just from Southeast Asia, even that would be a big win for me. And that was one of the goals that I set out to do. Because often as a young scientist, I do feel that my Asian identity, particularly in the last few years, that I realized is an important thing. So I think a couple of years ago, I presented at a Women in Science forum. And another young scientist, also of Asian background actually raised her hand and say, Thank you for being part of this topic, because I feel very seen just seeing you here. And then I realized that I may not come out and represent my culture intentionally. But even by being who I am, there is a part of identity that I'm representing. So that was a very big thing for me. The other big ticket item for me about Zhenyi is picking someone who isn't, kind of one single focus area of their work. Because of I have a very, very, varied background in my professional life. I started as a psychologist, went and did very different things into the public sector, into the private sector and now into digital health. And I always like to try different things. And so, picking a character that would do those different things, and maybe be also be famous for different things, both in the arts and the science, that was something very important. And so that's kind of how I narrowed into Zhenyi. And finally, I think, her sense of social justice, and the sense of well-connectedness that she seems to be someone who is connected with her circles, with her friends and with her world and have insights about that, and have something to say about it. That was something really struck me as someone very different. And I wouldn't go so far as I feel very similar to her, but someone that I really look up to.

AT: So can you tell us a bit more about your own work, because I do love, I love talking to all my guests. But it always seems like folks from CSIRO are doing really interesting things in their own right. So I always love to hear about that.

IW: Yeah, so my work. I started in psychology. And so I was a research psychologist. And I've always been very interested in decision-making. So how different people utilize information to make different decisions, and how do we enable people to make decisions that work for them? What kind of information should we present to them, that's always been something that interests me. Afterwards, I went into the private sector and the public sector, do some mental health service planning, and also in academia, as well. So I transitioned all different roles, but really focused on mental health, alcohol and drugs, suicide prevention. And because they're quite a vulnerable cohort, and it was very close to my, as a psychologist as well, obviously, mental health is important. And then a few things I went in to lead one of the national policy, working home birthing policy, because I thought, this is a very, there's a contentious issue. A lot of people have very strong feelings and opinions about that. And I want to be that person to help collate those ideas, and bring it into some unified kind of platform. I thought that would be a very interesting experience. And then I'm not sure if you heard about this, but this little thing called COVID came along.

(laughter)

AT: Tell me more!

IW: You might have heard about it somewhere. And it's one of those sliding door moments, because I always believe when life gives you an opportunity you grab it. That's just my ethos. So one day early on, in 2020, I got a call from a deputy director general in Queensland Health to say, "hey Ides, I'm not sure if you've been reading the news, but there is this little thing called COVID. And lots of people want information about that. And we need someone to collate this information and write it up and present that in whichever way that the audience needs. So it could be for our media conferences, it could be for a ministerial briefing. And it could be on the online website, for our health website, or for our clinicians. So we need someone to collate information and present that. And you are someone that I know could handle that and use different numbers, figures tell the story, it doesn't matter what area context is in." So I remember he said, "Ah, we don't think it's going to be long, we think it's going to last a couple of weeks, maybe a month."

(laughter)

AT: And that's why they needed you providing them with data to show them that that was not true.

IW: Yes, so I thought, well, and I discussed it with my partner at the time, and I said, Look, this is going to be a 24/7 job. But it's going to be two weeks, month tops. It would be a great experience, it would be an adventure. And so we agreed that I probably won't be home for two weeks, maybe a month. And of course, that turned out to be two, three years. And through that I learned a lot. I learned digital health, all the amazing things that our technology stores, because I don't know, if you recall, a lot of our COVID response came down to digital solutions. So that's how I transitioned by, kind of force into digital technology and then through that, I understood the capabilities and the potential that all of our lives could improve through digital mechanism. And I think that's when I got really interested and thought this is going to be my next thing that I want to try. And that's how I came into CSIRO to manage our digital health program here.

AT: And speaking of being someone who is skilled in all sorts of different areas, I hear that you are also a burlesque dancer, an oil painter, a pianist, you dabble in soap-making. All the things.

IW: Yes. All the things. And that's another thing that I found really relatable with Zhenyi's story, is that she didn't set out and say "my next thing will be horse-riding". I think when you read that, she met, you know, a Mongolian general's wife, who happens to be really good at that. And she's interested and she wants to learn. And that's how I picked up these hobbies. I think one day, I saw a burlesque workshop at an art studio. And I

thought, well, I'm not doing anything this Sunday. So I'm gonna learn about it. And I fell in love with it. And I just thought, I'll keep going. And same as oil painting, I think I picked it up as a way of teaching myself that I don't have to be really good at something. If I put my hard work in it and learn, I could become good at something with minimal training. And I always have my painting near my workplace to just remind me that sometimes you don't start out - well, actually, always, you don't start out being good at something, we all start out being really crap. And then we all learn through making a lot of mistakes that we then try to cover up or make something better out of it. So that's how I kind of came into all of these different hobbies. I have no idea what my next hobby is going to be. Between you and I, and whoever is listening, I am tiny bit terrified.

AT: But isn't it great when you go into something because you say, this looks like fun. Or in her case, it was, oh, here's an opportunity to learn something. And it's not, it doesn't have that pressure of "I need to make money off of this. I need to make a career out of this. I need to get a degree in this." The best pursuits I find are often the ones that it's just something you're doing because you love it.

IW: Yeah, absolutely. And I think I remember, because the most recent hobby is burlesque. And I remember trying and explaining it to people. And I said, Look, I don't know this. So there are two outcomes that could come out of picking up burlesque. I will hate it. But then I will know what it is and what about it I hate or I will find something new that I enjoy. So either way, there's no loss here. And I think that's what is beautiful about it. Like you said, you don't go out and say I need to have a next career in this. I need to be really good at this. You come out with that learning frame of mind of either way, I will learn something new about this thing and learn something new about myself in the process.

AT: That was all the questions I heard unless there was anything else you wanted to mention.

IW: The thing about Zhenyi that struck me is that, I think I tried to find that in science, is that there's this science versus art. So a lot of the scientists that I've found, they are kind of what you call hard science. And I tried to find scientists that, they're scientists, but in a way that is facilitative for other people. And I think I find that a little bit through Zhenyi, and a bit through Hedy Lamarr's work as well, is that I think often we have this sense to be a scientist, we have this image of what scientists do, and they need to speak in code almost. But I really want to be clear to people that it doesn't necessarily have to be that way. One time, I was at a Women in Data Science talk, and I was giving a talk about it. And one of the postdoctoral fellow came up and said, really enjoyed your talk and want to know about my work. And I can't remember what is it, I came up with a caveat of, oh, but I'm not a real data scientist. And she went, what does it mean? And I explained to her because I don't do coding. I don't write codes. I'm not a programmer. And she said, Oh, no, don't buy into that. Data science comes in so many disciplines. You are from social science, which is definitely one of the disciplines. And there's a lot of this kind of misconception that you have to code and, or speak in codes, to be a scientist. And she kind of reminded me that, you have sometimes questioned that this is maybe a false image that maybe some of our male scientists wants to portray, to tell us that we don't belong. And that's something that struck me as completely, I was dumbfounded because I think a lot of time as females, we don't get told, we don't belong explicitly, but we get told we don't belong, implicitly through other means, like, Oh, you don't have the experience, or, oh, we need someone who can be here for longer hours during the day, sort of implying your school pickup won't be able to make it. So we get told a lot of ways that you don't belong, not in those words. And so that's something that was I really want other people to think about that. And think that as a female scientists, or any scientist, you can actually come from all walks

AT: Even when you walk into a room and you're the only person like you, whatever that means, whether it's gender, race, disability, just the the visual impact of being in that room surrounded by people who do not look like you or think like you.

IW: It's very confronting. Yeah. And we can't be what cannot we cannot see. So, I think having that diversity, you know, in the discipline, and also in a leadership area, I think it's really important, not just so that we do have diversity for diversity sake, but I think it's important for our work to make sure that what we do, what other other walks of lives are captured in what we do. And also we provide that representation for other people to say, hey, we belong there.

AT: Join us next time on the Infinite Women podcast and remember, well-behaved women rarely make history