

Professor Simon Cherry

In this podcast, **Professor Simon Cherry** discusses how the discoveries of past physicists have influenced his work, the importance of teamwork for success in science, and how to build confidence in yourself.

Break the **podcast** down:

00:57: You and your collaborator, Ramsey, and the rest of your team have created an incredibly practical and useful medical scanner that's used all over the world, and it's all based on theories and concepts from physics. Could you explain how the work of famous physicists, like Marie Curie, has impacted your work?

The particular scanning technique that we are working on is called positron emission tomography, or PET scanning for short. It's based on the principle of injecting a very tiny amount of a radioactive substance into the body, which we then image. Marie Curie was foundational in her work on understanding radioactivity and isolating radioactive materials, and the true champion and pioneer for radiation sciences, so a huge influence on the field.

Another piece of what makes PET scanning possible is that the radioactive materials we use decay by emitting a positron. A positron is the anti-particle to an electron. It's just like an electron, but carries the opposite electric charge and is anti-matter. When it gets emitted into tissue, it very quickly will find the surrounding matter and undergo what's called annihilation, where the positron and electron disappear, and that mass gets converted into energy. The equation that governs that transformation from mass into energy is a very famous equation we've all heard of, which is $E = MC^2$, Einstein's famous equation of mass-energy equivalence.

So, the mass of a positron and electron get converted into energy. That energy gets emitted in the form of high-energy photons that can escape the body, and that's what we actually detect to create an image. So right there – Marie Curie and Albert Einstein – two critical pieces of science that underpin the medical imaging we do.

03:05: When you applied for your PhD in medical physics, you knew very little about the field and didn't really have a clue what you were getting into. How did that feel? What was it like, deciding to study something that was completely new for you?

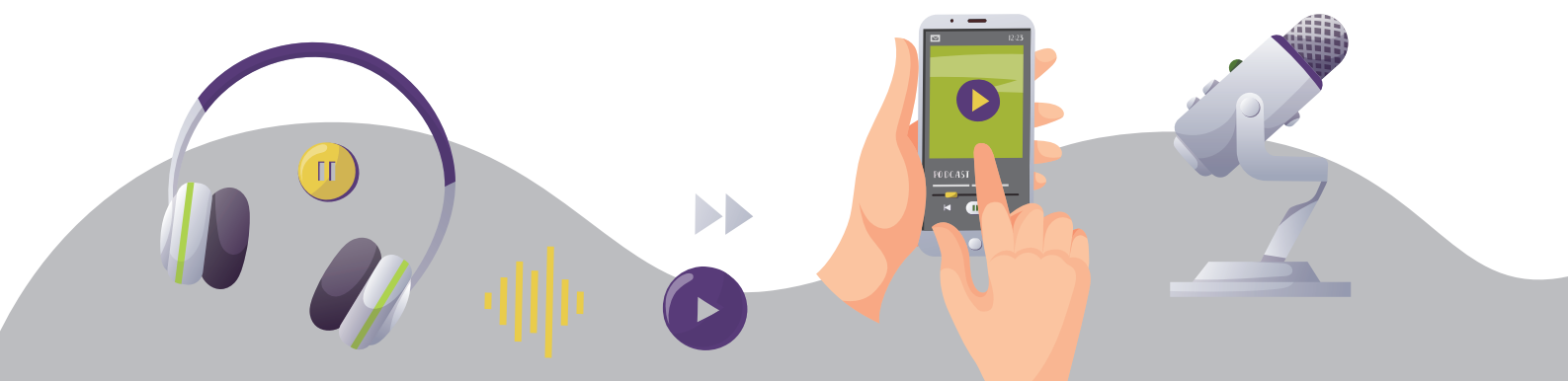
It was just happenstance that I saw some ads for PhD studentships in medical imaging. I knew I loved physics and I wanted to do a PhD but wasn't quite sure which area to go into. I liked atomic physics, nuclear physics and high-energy physics, but I couldn't quite see how I was going to fit into those areas. Then I saw this concept of medical physics, this field I'd never heard of before. I thought, this is really interesting because I can apply what I know about physics and it has a very practical outcome. And the rest is history!

04:05: Can you give any advice to anyone listening who is in a position where they know what they're interested in, but can't see how that's going to translate into a career or life plan?

Sometimes, it's just being in the right place at the right time. I think you can help create more of those opportunities by asking questions, looking around and talking to people. It often leads to possibilities and introductions that open doors. I think it's important to knock on as many doors as you can and see which ones open. You never know. The more enquiring you are and the more you reach out, the more opportunities you'll probably end up getting.

04:55: Another tip that you gave in the brochure was to be kind and respectful to the people you're working with. Obviously, that's great advice in life. How will it help students starting off in their career?

In most areas of science, and certainly the area that I work in, it's so multidisciplinary so you have to work in teams to be effective. Everybody needs to feel invested and valued and respected, otherwise it doesn't work. So, it's really important to build teams. It's like a football team. You want everybody to play together and if a team plays well together, they can be much more than the individual parts. It's exactly the same in science. ➔



I always feel that recognising what everybody brings, from the most junior to the most senior person, everybody brings unique skills, perspectives and life experiences that are important to the team. Respecting that and valuing that, that's the way you'll get the best out of everybody because they'll all feel part of the team and they'll all want to succeed.

06:05: Something you talk about in the brochure is that one of your proudest achievements is creating an interactive and collaborative research environment at the university. What effect does that have on your students?

Again, it comes back to what we were discussing earlier. It's important that everybody feels valued, and knows they have important contributions to make so that when the time comes, they feel comfortable to speak up and give their opinions and input. Because if they have the knowledge but stay quiet because they're concerned what people will think about what they're going to say, nobody gets the benefit. You've got to create an environment in which people are comfortable to speak. That's really important. Also, that builds their confidence, which helps them outside the university when they have to go to conferences and give talks and have to meet other leading scientists in the field. If they're used to those exchanges, they can be more confident when they're outside the university. And it's team-building as well.

07:10: A lot of people listening to this might be getting ready to go on to university and that can be quite daunting. It's quite easy to feel like you don't have the answers. What advice could you give to a student who is going to be going into that place where all the people there seem smarter than you, to help them find their feet and their confidence?

First of all, that feeling is a very common feeling, so don't think you're the only one who feels that way. I felt that way for sure when I first started university. I would say it took me a good year and a half of my three years there before I started to find my feet. I didn't do particularly well academically in my first couple of years because I was struggling a bit. The pace was a bit faster than it was in school. I just had trouble finding my feet, as you pointed out.

Just realise if you've got into university, you have something to offer and contribute. They didn't take you just out of charity. So, realise that you are smart and you deserve to be there and you're in your rightful place. Try and build links with other people there. Most lecturers are excited to talk about what they do and if a student is interested in asking questions, they'll generally respond very well to that.

08:40: Do you have any more tips about talking to lecturers? It can be intimidating if you think the lecturers are expecting you to have this intellectual sparring with them. Are lecturers expecting that from their students at first or are they just hoping they can have a conversation?

I'm always really happy when a student comes up to me at the end of a class and asks a question, either about the class material or maybe about what I do for research. Sometimes I've had students come and say, "I don't really know much about this area, but could I get a tour of your lab?" I'd be happy to do that. It makes my day when someone's interested.

In most cases, lecturers will respond very positively to somebody who's either interested in the course material or what they do for their research, so don't be afraid to ask. These people can be busy so they also may not respond as quickly as you might like. That doesn't mean they don't care; it just means they're busy, so persevere. Definitely don't be afraid to ask, and maybe ask if you can have a tour of the lab or ask if they have any opportunities to volunteer. Ask them if you're interested in a topic if they have suggestions for any reading material or something on the web that you could look up... just engage.

10:05: Do you have any final comments about how to move through your career, find what you want to do and pursue it?

What I tell my students, and my children, is to pursue what you love. You're going to be having a career for a long time. It may evolve and change quite dramatically over time but if you're doing things you enjoy, life will be good. So, try and pursue the things you like. Don't be put off by setbacks – you will have them. If you aim high, you're sometimes going to get knocked back. You just have to dust yourself off and go at it again. It's happened multiple times to me and everybody I know that's been successful along the way has had big challenges.

If you believe in what you do, you just keep going the best you can. So don't be afraid of aiming high, don't be afraid of pursuing your dreams. Of course, it's good to have backup plans, it's good to make sure that you can pay the bills at the end of the day, but perseverance and pursuing what you love would be the two main pieces of advice. Often, what opens doors is connections, which we've talked quite a bit about. So don't be afraid to talk to people who are doing the things you're interested in to see if there's a way you can get in and get some kind of research experience or an opportunity to work with that person that can open doors that you wouldn't even have known were there. There's no easy answer for this, but certainly don't give up if at first things seem to be a little challenging. Just keep pursuing your dreams as long as you can.

