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Suspense and discovery with Pint of Science

Nine scientists walk into a bar. Because they are there, 200 or so other people also walk into the bar. What do you have? A crowded bar full of people listening to scientists talking about their research over a drink in what has become a global science festival. This is Pint of Science!

Although a smaller event than last year's, Pint 19 was no less exciting.

South Africa is one of 24 countries that took part in the Pint of Science Festival held worldwide from 20 to 22 May 2019. 'We might not be in the same time zone, but for three days we're in this together and we are doing something,' enthused Micheline Franz, Co-Director of the South African Pint of Science Chapter. This year there was only one venue, compared with the three in 2018, but there are plans to expand again in the future. The event was appropriately held at Cause Effect Cocktail Kitchen in Cape Town – think dry ice cocktails overflowing with smoke.

This year's Pint of Science South Africa covered three themes: Our Body, Our Planet, and Atoms to Galaxies. Particularly rewarding this year was the familiar faces from the previous year's talks – both in the audience and in the speaker line-up. These are the beginnings of a new shared community that has been brought together by Pint of Science.

Last year, Dr Kerryn Warren spoke about what a human–Neanderthal hybrid might look like; she returned this year to discuss her adventures as an 'underground astronaut' in Lee Berger's team at the Cradle of Humankind in Gauteng, that involved climbing through a cave network with an 18-cm pinch point to enter the Dinaledi Chamber, where *Homo naledi* was discovered in 2015. 'I'm just here to have some fun,' she reflected during the evening as she sat with a *Homo naledi* skull from the excavation resting on the table in front of her. And she certainly seemed to have fun talking the audience through her experiences:

You have to actually cave in a difficult system for 30 minutes just to get into the Chamber, [then smiling] – but we have wifi! So we have our priorities straight.

It's not unusual for us, while we're in the cave, to Google Hangout with Lee Berger in Command Centre so that he can see that we're safe. But he's just spying on us so he can see the cool things that we're seeing.

Warren often talks to school groups about her work – including from inside the Dinaledi Chamber while she was there. She is currently doing her postdoc in evolution education, which complements her previous palaeontological work.

Warren is appreciative of initiatives like Pint of Science because she believes that:

a lot of people who opt in are really interested in science in general, and I don't think they have a lot of opportunities to just casually interact with scientists and their research, so this is a great opportunity to do this.

Two other returning speakers, Dr John Woodland and Dr Rubina Bunjun, are also keen science communicators. Woodland spoke this year about the journey of drug development 'From Bench to Bedside', and Bunjun's talk was about the controversial possible link between increased HIV infections and injectable hormonal contraceptives.

With an audience ranging in age from 9 to 79, Pint of Science South Africa certainly has found wide appeal – and it is great to see plans being made to include interested under-18s more directly, even though the event is pub-based.

The casual setting also allows the public to appreciate the human side of scientists. After his visually rich talk about radio astronomy – including a feature on the first ever imaging of a black hole – Dr Vasaant Krishnan crouched down, pint in hand, to talk to a young lad. Young Joshua was desperate to ask Krishnan a question but had been too shy to speak up during the question session after Krishnan's talk about MeerKAT (an array telescope that forms part of the Square Kilometre Array project, where Krishnan is a Junior Commissioning Scientist). Krishnan explained:

The reason that MeerKAT is so good at what it does is because it is not just a single telescope, but a collection of 64 of them working together. They are all synchronised to observe the same source at the same time.

With an array telescope you can combine data from multiple receptors to 'artificially create a telescope that is as big as the distance between them'. So, in fact, as Krishnan pointed out, 'Meerkat is essentially a telescope which is 8 km big.'

To illustrate the additive power of combining receptors, Krishnan showed an image of an orange ellipse on a black background – the centre of our galaxy imaged using two receptors. Krishnan then slowly walked the audience through the improvements in resolution from two receptors, to four, to sixteen, until the full array was complete and the blobs had resolved into separate shapes: supernova remnants, the Sagittarius A* black hole, and vertical lines that may provide clues to the direction of the galaxy's magnetic field. 'So adding those receptors has improved MeerKAT's resolutions and also its sensitivity,' concluded Krishnan as he showed the high fidelity image of the centre of the Milky Way that had been unveiled at the 2018 inauguration of MeerKAT.

Appealing to those present who were closer to the older end of the age scale, Prof. David Tabb talked about the use of biomarkers in diagnostics, and how these can reduce the need for invasive techniques, such as colonoscopies, that become more common with age. 'Turning 50: what kinds of gifts will you receive from your doctor? Number one – you will receive a colonoscopy!' Tabb went on to list other undesirable 'gifts' that are advised for screening, concluding the list with, 'Turning 50? Not advisable. Not advisable... So, how can we make things better?'

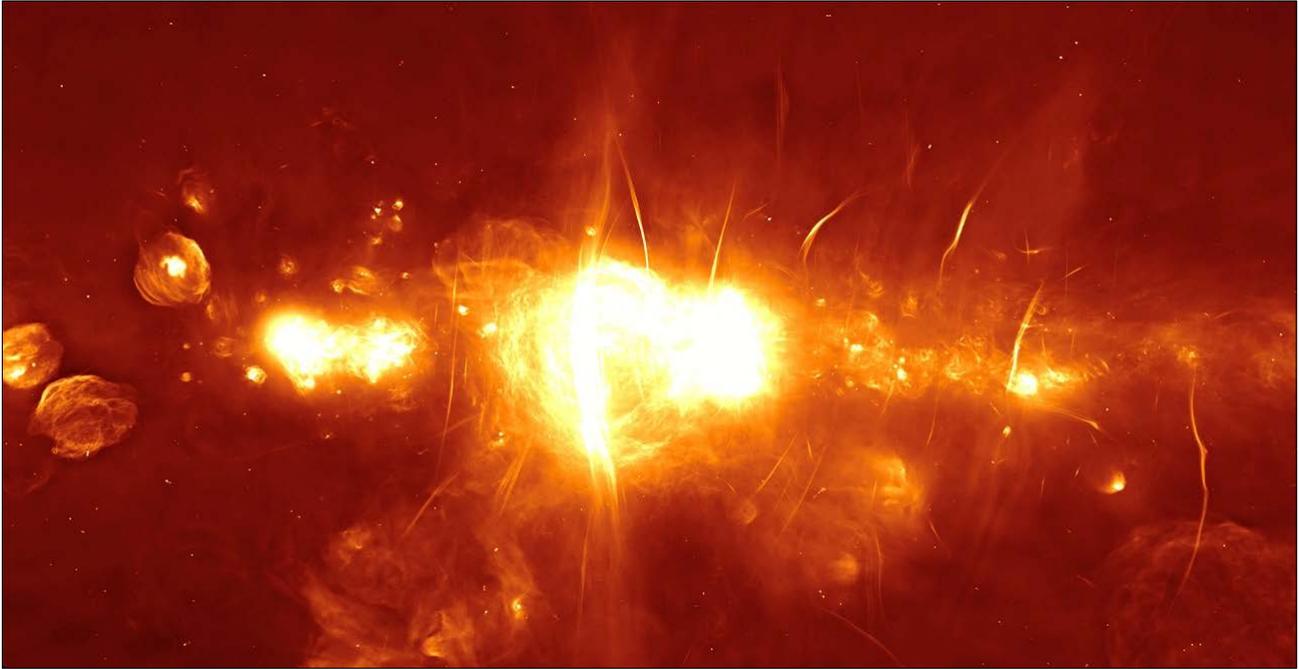


Image of the centre of our galaxy using information obtained from MeerKAT (image: South African Radio Astronomy Observatory).

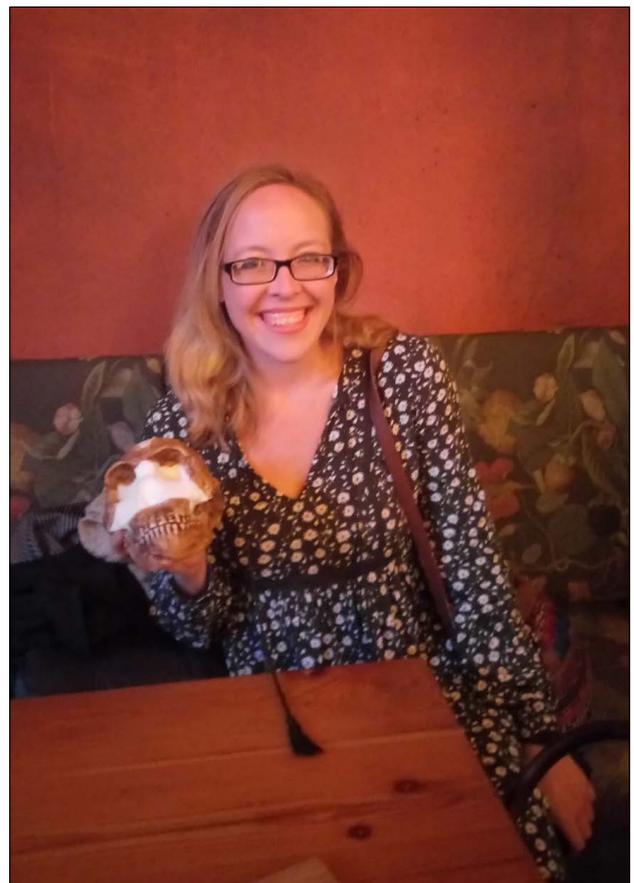
The focus of Tabb's contribution was on the research that he did while in the USA on the early detection of colon cancer, but in recent years he has become more involved in exploring urine and blood as biomarkers for tuberculosis research in South Africa. Tabb followed on from the drug discovery talk by Woodland, highlighting the striking parallels between finding a useable drug from the millions of candidates, and finding a potential biomarker out of thousands of candidates. These similarities highlight the challenges faced by scientists aiming to improve medications and diagnostics – with massive investments being made during years of disappointment, before, finally, a promising candidate drug or biomarker is identified.

'It really is a very high risk, possibly high reward game,' says Woodland. 'Fortunately, there is some cause for optimism and hope, especially locally.' He showed a picture of Dr Kelly Chibale, head of the H3D Drug Discovery Group in Cape Town, which has had some success in making new antimalarial drugs.

What's very exciting is we've got a clinical candidate for malaria, MMV048. It's a single dose cure that's made it all the way to Phase II clinical trials. So that's in Ethiopia at the moment. ... With any luck that might be the very first drug that makes it onto the market that was developed right here, in Cape Town, in South Africa.

It is stories like these – of suspense and discovery – that draw people to science, and keep people coming back to events like Pint of Science. 'It brings you into a space that you wouldn't usually be in,' mused Franz, 'And it takes you further in a Google search, because you can actually talk to the researchers doing the work.'

If you are interested in helping Pint of Science expand in 2020, within Cape Town or across other areas of South Africa, please email contact@pintofscience.com



Kerryn Warren with a *Homo naledi* skull (photo: Clare Garrard).