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Music from the black hole

Will an extraordinary work called *Black Hole Symphony* be a triumph for science? **Bethan Ackerley** takes a peek at this upcoming concert series



Music Black Hole Symphony

David Ibbett

Museum of Science in Boston, Massachusetts, and Multiverse Concert Series

On 28 July and 25 August

TAKE a second to imagine the sound of the cosmos. What comes to mind? Is it the howling winds of a far-flung exoplanet? The roiling eruptions at the surface of the sun? Or simply the nothingness that would greet you in the boundless vacuum of space?

In the absence of recordings of the “real” sounds of our universe, you may well have thought in terms of music. Some of our most potent attempts to represent these sounds creatively have been made through musical composition: think of the sweeping strings and martial brass of Gustav Holst’s *The Planets*, or the warbling electronica of *Forbidden Planet*. Yet these efforts are typically figurative, divorced as they are from the material reality of space.

So what happens if you inject some real science into the creative mix? *Black Hole Symphony*, which was penned by composer David Ibbett and is due to be performed by an orchestra at the Museum of Science in Boston, Massachusetts, is doing exactly that.

The work cleverly translates cutting-edge research on black holes into an electro-symphonic score with five movements. It combines narration from scientists with immersive, planetarium-style visuals based on images taken by scientific instruments, including the

David Ibbett set out to capture black hole complexity in sound

Event Horizon Telescope, a large array made from a global network of radio telescopes, which took the first image of a black hole.

These elements create a voyage through the features of a black hole, one of the most enigmatic phenomena in our universe, from the swirling torus of dust that surrounds it to the beams of ionised matter it emits, which are known as relativistic jets.

Capturing this complexity was crucial to Ibbett. “It’s not just a sort of single homogenous experience of getting sucked into a void,” he says. “You have these different regions of the dust and rock and superheated clouds, shining with echoes of light. The disc itself, the gravitational lensing – it’s just a really rich story that needed to be told.”

Ibbett worked with researchers at the Center for Astrophysics and

the Black Hole Initiative, both in Cambridge, Massachusetts, to transform the latest black hole data into music.

Data sonification is a small but rich field in which information – which can be about anything from the crystallisation patterns of salt

“One section of the symphony is drawn from a simulation of two black holes merging”

to the effects of climate change on cedar trees – is conveyed through sonic qualities like pitch, tempo or rhythm.

The harmonic structure of *Black Hole Symphony* is built around the electromagnetic emissions of a black hole and its surrounding phenomena, with radio waves

pitched low and gamma rays high.

Another section of the piece, drawn from a simulation of two black holes merging, allows the stretching and squeezing of space-time by gravitational waves to dictate the glissando (sliding between two notes) of a trombone.

Key to bringing the composition to life was finding instruments that seem to fit the “character” of the black hole’s components: the relativistic jets become a distorted electric guitar, for example, while the torus is represented by the French horn.

It is here that Ibbett has played with our existing canon of “space sounds”, subverting expectations at times and playing it straight at others. The symphony’s opening strains, for instance, would feel perfectly at home in the filmed version of a space opera.

“I hope that we got all those cliché moments in the mix, but they’re put through their paces because of the data that goes into the piece,” says Ibbett. “That sends the music down a path that you wouldn’t otherwise have gone down, and hopefully results in something new.”

In its dedication to the new and unknown, *Black Hole Symphony* inspires as much as it informs. The music looks on to the future of astrophysics in a passage that represents the Laser Interferometer Space Antenna, which will one day hunt down gravitational waves.

“We want to leave people with an appreciation, a wonder and curiosity about the universe and about black holes, but also about music and art and how it brings us all together,” says Ibbett. “It’s something that we can celebrate without any caveat.”

To listen to preview clips of *Black Hole Symphony*, head to blackholesymphony.com. ■



RAJARAN PALANIMURUGAN