# Beyond wonder

While art and science both seek to help us understand the universe, five artists show Andy Extance why the disciplines need not be mutually exclusive

**Quantum art**

In 1999, Julian Voss-Andreae was part of a team that showed $C_{60}$ molecules could exhibit wave–particle duality, making buckyballs the most massive particles that wave behaviour has been observed for. For the artist, based in Portland, Oregon in the US, working in the University of Vienna lab of Wolf Prize winning Austrian physicist Anton Zeilinger was 'incredible'.

'That first-hand experience of the deeply puzzling underlying nature of reality has informed my path since,' Voss-Andreae says. 'It feels to me that I have received a sense of an underlying quantum world and I want to apply it to people, pull it from physics into our collective mind and create metaphors for it, because I feel there is so much we need to learn from it. Scientists first, and slowly everyone else, are forced to see that we cannot separate the observer from the observed, and that our intuition of a reality "out there", with definite properties regardless of whether there is anyone there to observe it, is not tenable.'

To highlight this, Voss-Andreae has created a series of quantum people, sculpted from thin parallel steel sheets that appear and almost disappear depending upon your viewpoint. Having made a reclining woman who becomes nearly invisible when you look into her eyes in 2012, he's built on the idea for his latest work, *Spannungsfeld*. 'I created two figures, a man and a woman, looking at each other, and they disappear along the line of their sight, so they never see each other,' Voss-Andreae says. 'The German title of the installation, which literally means "tension field", originated in physics but it's used in contemporary German almost exclusively in a metaphorical sense,

**Voss-Andreae's *Spannungsfeld* sculptures are inspired by quantum physics, in particular his own work on wave–particle duality**



Czarnecki's works using discarded body parts, like *Palaces*, which incorporates children's milk teeth, are inspired in part by the use of hair and fat in Nazi concentration camps

implying a dynamic tension, often between polar opposites, that permeates everything in its vicinity.'

Voss-Andreae also creates sculptures inspired by protein structures, and is now working on an NSF-funded collaboration using DNA as a building material for nanoscale machines. 'We started this last year and at this point I am learning a lot about DNA origami structures,' he says. 'I am finding ways to represent the systems we are interested in as real objects or in the computer. The expectation is that my expertise contributes to the research and that the research in turn inspires novel artworks in the future of the collaboration.'

### Visceral impact

At age seven, Gina Czarnecki, the daughter of a concentration camp survivor, visited the site of the Majdanek concentration camp in Poland. 'I learned how many bodies filled the ovens, about the soap made from collected fat and the socks for train guards made from human hair,' recalls the artist from Liverpool in the UK. From that visit an interest in human bodies may have started evolving, she tells *Chemistry World*, which today she uses to create senses of threat and irony in her work.

**'Czarnecki filled a pair of art deco armchairs with rendered fat'**

Arguably her most powerful use of this instinct has come in a collection called *The wasted works*, using 'discarded' body parts to look at taboos around using human matter. Funded by the Wellcome Trust, and in collaboration with Imperial College London biologist Sara Rankin, the project broke new ground in establishing what consent Czarnecki needed to do this.

In *Canapé*, Czarnecki re-upholstered and filled a pair of art deco armchairs with a wax-like substance made from rendered fat. *Trophies of empire* is a pair of suspended stalagmites and stalactites made from hip bones encrusted with crystals of salt and sugar, which act as preservatives. In *Palaces*, she attaches children's donated milk teeth to a glassy castle, adding more as she receives them so that it grows like coral.

One of the project's aims is to deal with the organ harvesting scandal that hit Liverpool's Alder Hey hospital in the 1980s and 1990s. The Human Tissue Authority, created as a response to this unauthorised retention of organs, concluded Czarnecki's project only needed donor consent. But with the powerful emotions that 'organ harvesting' had unleashed, she has also used public debates to open the issues she explores for further questioning.