

The art of the periodic table



No science classroom is complete without a periodic table. Although students new to chemistry are often confused by the uneven shapes that organise the elements, experienced chemists know that this elegant diagram is the key to understanding the natural world. Thus, IUPAC has named 2019 the International Year of the Periodic Table to inspire both scientists and the public to celebrate its beauty. Melbourne-based artists Damon Kowarsky (<http://damon.tk>) and Hyunju Kim (<http://hyunju.tk>) have created a collection that does just that.

In 2017, Kowarsky was approached by Soula Bennett for a project that would marry art and science. Bennett is the Director of Quantum Victoria (www.quantumvictoria.vic.edu.au), one of six Specialist Science and Mathematics Centres established by the Victorian Department of Education and Training. Quantum's mission is to cultivate curiosity and motivation in students and teachers to promote excellence in STEM education. Bennett had a vision for an installation in her Centre that would imagine 'the birth of the universe through the lens of the periodic table'.

Kowarsky is an award-winning artist trained in scientific illustration, making him the perfect candidate to bring her vision to life. Bennett and Kowarsky worked closely to select 49 elements that came into existence in the early universe, along with famous scientists who would be

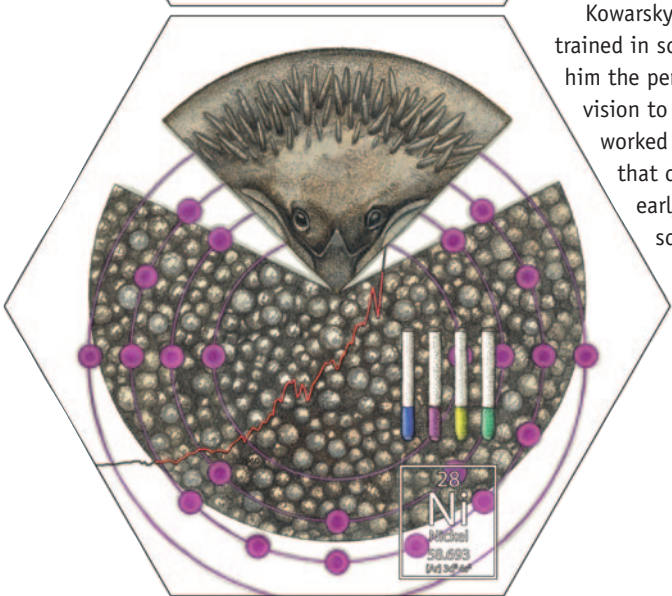
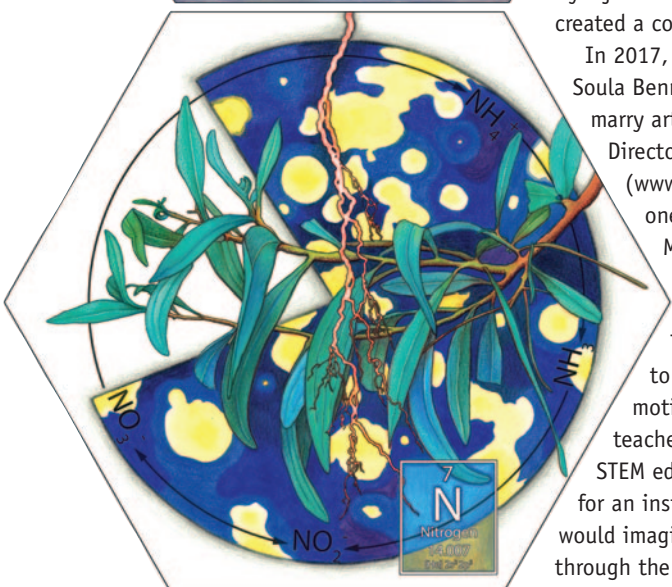
generally familiar to students. Bennett required that each piece included not only the element's symbol and atomic number, but also scientifically relevant information about its properties and use.

Kowarsky did extensive research to compile each aspect of the proposed images. He then hand drew each piece before sending them to collaborator Kim to complete the colour. The final result shows the unique beauty of each element in the collection.

For elements such as sodium, Kowarsky did not want to rely on a depiction of the material's physical form. 'What strikes me about sodium is its reactivity, which depends on the electrons', says Kowarsky. Although the electrons are shown organised in shells as per the Bohr model, the colourful background gives an impression of the complexity of orbitals overlapping in the atom. The image also includes sodium's emission spectrum, a fusion diagram and a series of interestingly shaped sodium light bulbs.

Other pieces emphasise the element's cultural relevance. The piece for uranium features the atomic bomb in front of an aerial view of Hiroshima. The chain reaction that makes uranium so powerful can also be seen alongside test tubes of assays that are used to determine the element's oxidation state.

Several of the elements include distinctly Australian features. 'Wherever I could, I tried to bring in pieces of Australian nature and culture because I want our students to know that the periodic table is a part of their everyday lives', says Kowarsky. For example, eucalyptus leaves are prominent in the



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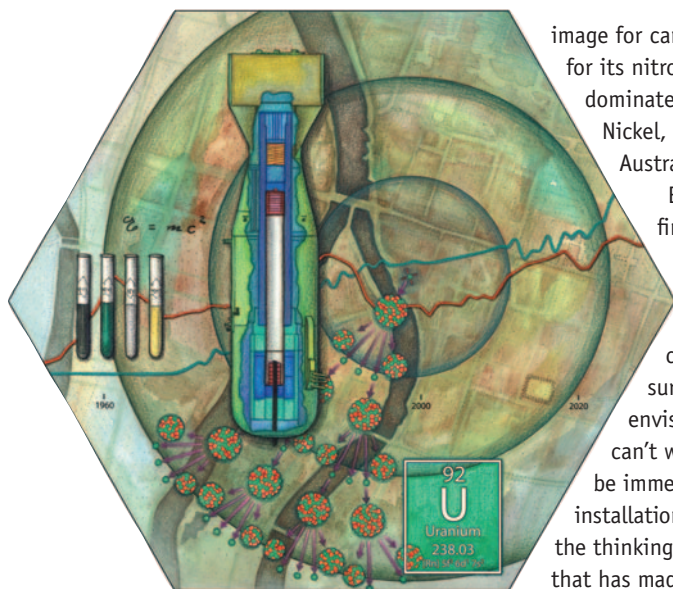
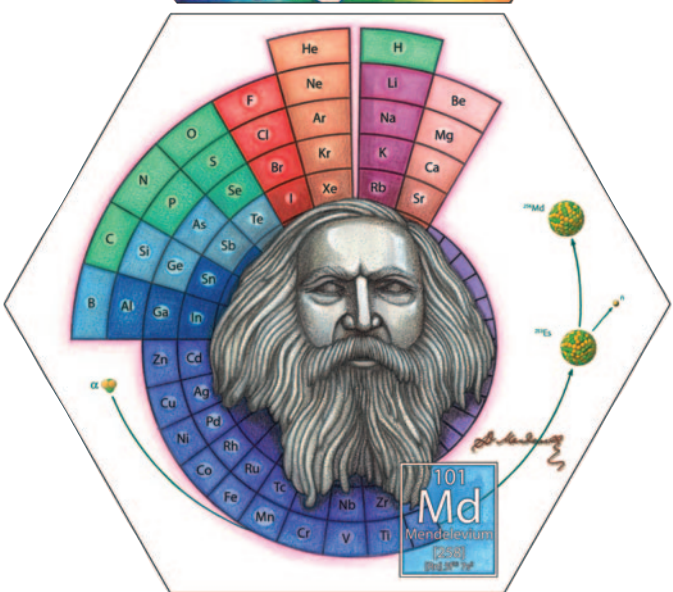
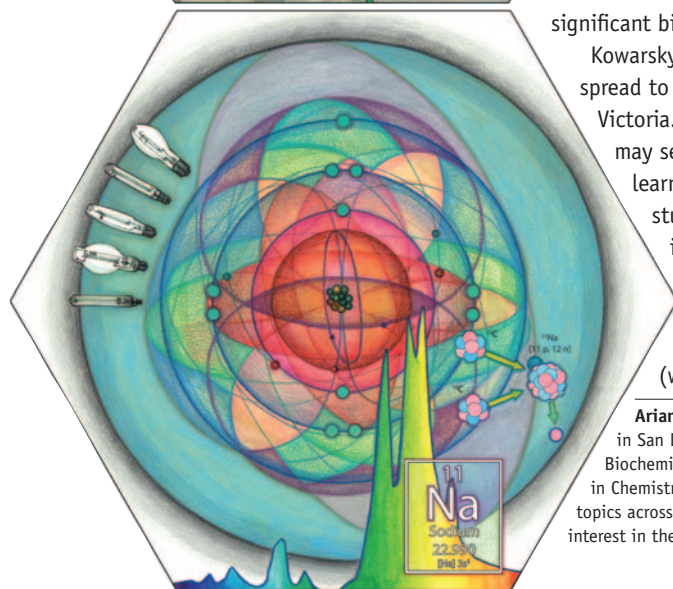


image for carbon. The acacia tree, known for its nitrogen fixation abilities, thus dominates the image for nitrogen. Nickel, too, shows a piece of the Australian five-cent coin.

Bennett is thrilled with the final results, which will be launched at Quantum Victoria on 18 July 2019 in an event open to the community. 'It so far surpassed what I had originally envisioned', says Bennett, 'I can't wait for Victorian students to be immersed in the beauty of the installation and come to appreciate the thinking behind the periodic table that has made it one of the most significant big ideas in science.'

Kowarsky himself hopes the work will spread to classrooms beyond Quantum Victoria. While the periodic table may seem daunting to early learners, these pieces engage students from all backgrounds in the beauty and creativity of science. The full collection can be found on Kowarsky's website (www.periodictable.gq).

Ariana Remmel is a science writer based in San Diego, California. With a BA in Biochemistry and Molecular Biology and a MS in Chemistry and Biochemistry, Ariana covers topics across the physical sciences with a special interest in the intersection of art and science.



ARC Industrial Transformation Training Centre opens in Sydney

On 14 May, the NSW Chief Scientist, Professor Hugh Durrant-White, hosted the launch of the New South Wales Node of the ARC Industrial Transformation Training Centre for Chemical Industries (ATCI) at the Office of the Chief Scientist in Sydney.

The Centre brings together three leading universities (the University of Melbourne, the University of New South Wales and Swinburne University of Technology), chemical industry companies and Chemistry Australia (formerly PACIA). The Centre will host 30 Masters of Science – Industrial Research (MScIR) students, who will complete industry-led research projects to be undertaken with a minimum one-year placement in industry. The Centre will host postdoctoral fellows to lead advanced industry-led collaborative projects with Centre chief investigators.

This unique collaboration will provide greater alignment between the chemical industry's need for highly-skilled STEM graduates equipped with excellent academic training, relevant industry skills and experience.

Industrial participants in the program include Dulux Group, Qenos, Boron Molecular, PPG Industries Clarity Pharmaceuticals and DCS Technical/Loop Hydrometallurgy, the latter of which is headed by Dave Sammut, Coordinator of the RACI's Mentoring Programme and regular contributor to *Chemistry in Australia*. All of the Centre's students will be invited to participate in RACI Career Development initiatives.

Enquiries about the centre can be made through Aaron Gosling (agosling@unimelb.edu.au) or Donavan Marney (d.marney@unsw.edu.au). Further details about the centre at www.arc-chemind.org.

Dave Sammut