

# WORLD'S SMALLEST MCA

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6.5 x 2.8 x 0.8 inches (165 x 71 x 20 mm)  
<300 grams (including batteries)

**Runs for 24 Hours on  
2 AA Batteries**

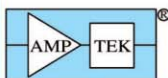
## FEATURES OF THE MCA8000A

- 16k data channels
- Stores up to 128 spectra
- Conversion time <math><5 \mu\text{s}</math> (>200,000 cps)
- Two stage input analog pipeline
- Differential nonlinearity <math><\pm 0.6\%</math>  
Integral nonlinearity <math><\pm 0.02\%</math>  
Sliding-scale linearization
- Two peak detection modes: first peak after the threshold (nuclear spectroscopy) or absolute peak after the threshold (particle counter calibration in clean rooms)
- Two TTL compatible gates for coincidence and anticoincidence
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- Stand-alone data acquisition
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**Free Software**  
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Free PC software supports ROI, energy calibration, peak information, MCA configuration, and file management

**XRF-FP Quantitative Analysis Software**  
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## Careers

### Once a physicist: Julian Voss-Andreae



**Julian Voss-Andreae** is a sculptor based in Portland, US ([www.julianvossandreae.com](http://www.julianvossandreae.com))

#### What first attracted you to physics?

As a child I read a lot of popular-science magazines, and was fascinated by relativity and images of distorted space-time. Later I became especially interested in quantum mechanics and how it shatters the things we take for granted, such as locality and causality. I planned to study painting at the art academy in Berlin, but in a philosophy class I took at the Free University I came across Roger Penrose's brilliant *The Emperor's New Mind*, which helped me change my mind and take up physics instead of art.

#### What kind of research did you do?

In early 1999 I moved to Vienna to do graduate research. I had heard Anton Zeilinger talk in Berlin and I was intrigued by his research, which is guided by his philosophical interest in quantum theory. Zeilinger had just moved to Vienna and I had the opportunity to be involved at the very start of his molecular-optics experiments, which culminated in the observation of interference of  $C_{60}$  molecules (buckyballs) – essentially a double-slit experiment with big chunks of matter. At the time, this molecule was the most massive and complex object in which wave behaviour had been observed.

#### When and why did you decide that you wanted to become a sculptor?

In 1999 I attended a workshop in Cortona, Italy, designed for scientists who are interested in learning about the humanities, art and spirituality. People in the lab made fun of me, referring to the workshop as my "dance lesson", but my experience in Cortona proved very influential. I made my first sculpture there – a stylized standing man carved out of hardwood – and met my future wife, Adriana.

After I had finished my diploma, I moved to Portland, where Adriana lived, and enrolled in art college to pursue my old dream, although I was now much more interested in sculpture than painting. While I was there, I realized that Linus Pauling was from Portland, but that there was nothing there to celebrate this incredible man. I had some ideas for a memorial based on one of Pauling's discoveries, the spiralling protein structure called an alpha helix. I was fortunate enough to be able to make a large permanent



outdoor sculpture as part of my thesis work, getting some nice TV coverage even though I was still a novice sculptor. I graduated in 2004 and since then have worked full-time as a sculptor.

#### What projects are you currently working on?

I have three large commissions: early next year I will be installing a 7 foot stainless-steel version of a piece based on the haemoglobin molecule for a scientist in Switzerland. Roderick MacKinnon, who won the 2003 Nobel Prize for Chemistry for elucidating the structure and function of a potassium-channel protein, has commissioned me to create a sculpture inspired by that structure for him. And the new Scripps Institute in Florida has recently asked me to create a sculpture based on the antibody molecule to be installed in 2008.

As well as protein structure, I am interested in finding sculptural metaphors for aspects of quantum physics. I have made several "Quantum Buckyballs", based on the research in Vienna, and have just finished the largest so far, a steel buckyball 30 foot in diameter encaging two full-sized maple trees in a state park in Oregon. I also recently finished the first version of "Quantum Man" (see *Physics World* September p7), inspired by the question of what the wavefunction of a moving human would look like. My dream is to make a very large version of "Quantum Man", 60 or 70 feet tall, maybe on the island of Helgoland, where Heisenberg discovered his version of quantum mechanics.

#### How does your physics background help you in your career?

I feel very much like a physicist in everything I do. I use maths a lot; I write my own computer code in C++ and my proposals in LaTeX; and I keep a "laboratory notebook" where I record everything I do. And, of course, one of the major sources of inspiration for my sculptures is the wealth of images I have in my head from studying physics. Also inspired by my study of physics is my desire to find a "guiding principle", like Heisenberg's choice to include in his theory only quantities that are observable. In a way, that is related to my desire to make art less anthropomorphic. Art seems to be mostly about the particular artist who happens to have created it, but in a way good art is – like good science – always something "beyond the personal, removed from the arbitrary", as Einstein puts it.