

## Pop-up physics

### **A Voyage to the Heart of Matter: The ATLAS Experiment at CERN**

by Emma Saunders with Anton Radevsky  
Papadakis: 2009. 8 pp. £20

Finally up and running after a 14-month repair job, the Large Hadron Collider (LHC) at CERN, Europe's particle-physics laboratory near Geneva, Switzerland, is the most complex experiment in the world and took thousands of physicists well over a decade to assemble. So it is perhaps to inspire empathy that an LHC pop-up book asks its readers to spend a few minutes fumbling with pieces of paper that (eventually) fold into a model of the giant ATLAS detector, one of four detectors at the collider.

This feature and others do not necessarily mean that *A Voyage to the Heart of Matter* is aimed at young children; indeed, its author, Emma Saunders, admits that she would not let her three-year-old son flip through it unsupervised. But it is perfectly suited for any adult



**Detector origami: the pop-up model of ATLAS.**

with even a passing interest in the LHC and a desire to try their hand at detector assembly.

The book manages to pack an incredible amount of information about the collider into just four spreads. The first guides readers through the layout of the collider and its design; the second and third describe the ATLAS detector in detail; and the final spread, the book's most beautiful, shows galaxies in flight around a swirling maelstrom of primordial particles similar to those being hunted by the LHC

physicists. In addition to a main pop-up, each page contains four flaps that open to reveal further facts about the collider and its goals.

The book's greatest charm is its obsession with detail. There is no reason one would have to include an 'inner detector' in the ATLAS mock-up; yet physicists would surely object if it was not there. Similarly, the fountain-like recreation of the Big Bang, in addition to being beautiful, is highly accurate. At its base — corresponding to *The Beginning* — lie unconfined quarks, while the upper layers correspond to the cosmic microwave background, the beginnings of large-scale structure, and the eventual formation of galaxies.

Most important, the pop-up format actually improves the book. Rather than being gimmicky, each pop-out genuinely illuminates the workings of the detector and the interactions of the particles it hopes to find. The book would be the perfect holiday gift for any armchair physicist who wants a little taste of life at the LHC. ■  
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PAPADAKIS PUBLISHER

## Trust puts the self on show

### **Identity: Eight Rooms, Nine Lives**

Wellcome Collection, London  
Until 6 April 2010

A maze of corridors winds through featureless partition walls, adorned only by mirrors ranging from the exotic (Etruscan artefacts from the collection of Sigmund Freud) and the surreal (a digital 'time-lapse' mirror in which one's past movements materialize belatedly, like a ghost) to the banal (a cheap, plastic shaving mirror once belonging to actor Michael York). The corridors feed into eight rooms, each exploring an aspect of the knotty question of who we are.

*Identity* launches a series of national events organized by UK science-funding body the Wellcome Trust. At this showing, Ken Arnold, head of public programmes at the Wellcome Collection in London, announced that the upcoming tenth anniversary of the draft human genome seemed a timely moment to step back with a mix of medicine, popular culture and high art, designed to get at a "dauntingly broad" question. "We quickly found that philosophy and neuroscience really didn't have answers to some very basic questions about identity," said one of the co-curators, Hugh Aldersey-Williams. "Meanwhile, biology, society and law

find themselves increasingly in conflict over these basic issues." Their strategy in tackling the vast subject was to choose eight topics, each introduced by a figurehead personality.

One of these is geneticist Alec Jeffreys. Behind glass are artefacts from his childhood: a well-loved copy of *Biggles Works It Out*; a school report displaying all A grades (including 19.5 out of 20 in science), apart from a B in writing and a C+ in physical training and games ("tries hard"). In another case, the trappings of Jeffreys' scien-

tific life are arrayed like ancient relics: a battered Geiger counter, an X-ray film with scattered black bands; a pivotal *Nature* paper (*Nature* 317, 818–819; 1985). Among these everyday tangibles, Jeffreys's eureka moment is mapped with remarkable precision: "At 9 a.m. on Monday 15 September 1985, he found what he was looking for," says the placard. "By afternoon he had coined the phrase 'DNA fingerprinting'."

Unlike the other isolated rooms, Jeffreys's is fused with that of Francis Galton, the Victorian polymath who pioneered fingerprinting as a means of identification. Aldersey-Williams confesses to an attempt to draw "cheeky parallels" between the trivialities of the two men. Thus,



**Francis Galton and Alec Jeffreys (centre) both pioneered fingerprinting: the first using ink, the latter, DNA.**

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