

## ARTISTS' BOOKS

### His Dark Materials

**Ian Andrews** talks to **Sarah Bodman** about his collaboration with a particle physics group resulting in artists' books exploring dark matter

Ian Andrews is developing a new series of books about the Large Hadron Collider (LHC). These form part of an ongoing collaboration with Prof. Kostas Nikolopoulos from the particle physics group at University of Birmingham (UK) who is currently impatiently waiting for the LHC to come back online after its upgrade to achieve the higher energy levels needed to search for the phenomena of dark matter. Whilst the LHC is inactive Andrews has been researching 'earth pigments and naturally occurring radioactive material so that the drawings about matter are made from "stuff" that actually involves a form of particle interaction, radioactivity.'

Andrews speculates on 'what traces dark matter might leave. My work is based around the hand-drawn mark and the residual printed trace. I use masks and templates to draw and spray against and take impressions from these when still wet. The books use a monoprint-like seeping of white ink through black pages.' This references cloud chamber images from late 19th-century detectors invented by CTR Wilson, originally to study atmospheric effects in his laboratory, which inadvertently showed subatomic particle trails.

Andrews admires the 'Feynman diagrams invented by theoretical physicist Richard Feynman, to help visualise interactions for mathematical calculations. These diagrams of the behaviours of subatomic particles identified the necessary calculations to "make the invisible visible" as inspirational examples of the links between drawing and scientific enquiry. Paul Klee's Bauhaus lecture notes (*The Thinking Eye*) provide a practical example of how to strip my practice back to the elemental elements of point, line and shape. I search for connections between them and the elemental particles characteristics of spin, mass and charge and the interactions between particles that are a constant choreography of transformation.'

'My response to quantum mechanics is a serious effort to understand it, visualise it and find equivalents between the elemental language of drawing and particle interactions, something verifiable where Kostas could say "yes I can understand why that set of marks is being used." For me it has become an opportunity to reconnect with visual forces in the language of drawing, with Kostas given a way in to understanding my work. This has encouraged greater rigour in my thinking and I have been intrigued by his surprise that I don't learn everything I can, and then when I understand - make the drawings. As an artist, I can make what I consider finished legitimate statements in drawing terms with varying levels of scientific understanding.'

The drawings speculate what traces dark matter might leave. 'Despite the success of particle physics research over the last 100 years, culminating in the standard model, unfortunately this only accounts for 5% of what is out there, the rest is dark matter and dark energy. Dark matter is so called because it doesn't interact with visible light so any visualisation is a fraud in a way. It does interact with gravity so the leaking through of pigment refers to this, and as less traces of ink make their way through to deeper pages, so less information is retained - referencing the difficulty in finding dark matter and how we only see indistinct traces from which we infer its existence.'

Alongside exhibitions of the drawings and artists' books, Andrews and Nikolopoulos run practical workshops for schools, colleges and adult groups. 'We use techniques from the visual arts to help explain complex quantum phenomena and champion a dialogue between art and science. Participants experience drawing, photography, sculpture and performance introducing them to particle physics. Prof Nikolopoulos also works with dancer/choreographer Mairi Pardalaki and was awarded the European Research Council's inaugural public outreach award for his work with Maria and myself.'

‘Each book is usually on the go for several months. There can be considerable gaps in the time spent working on them, time for reflection and more research; they become a collage of thoughts and levels of understanding. They have to be long enough to reflect the amount the data that needs to be collected at the LHC before discoveries of new quantum events can be announced. At first the work resembles coded information or modern graphic notation. Marks and gestures are chosen in response to particle characteristics and interactions and these are partially formed by making marks against prepared templates that interact with the pen during the drawing process. However now it feels that because tremendous forces are operating at the quantum level, I need to utilise a more vigorous manipulation of ‘matter’ to reflect this and embody the ideas in the “stuff” and media of a drawing.’

An exhibition of new works is planned for 2021, for updates, please visit:  
<http://thesketchbookandthecollider.com>

There are 2 books-

The images will be labeled with the title, either The Network or Your Guess:

### **The Network**

*The Shuffle of things: The Network*, 2020, Ian Andrews, 40 page, loose-leaf, hand-drawn artist's book, white ink on black tissue paper, (530 x 800 mm, double-page spread), unique book. Photo: Ian Andrews

### **Your Guess**

*The Shuffle of things: Your Guess*, 2020, Ian Andrews, 40 page, loose-leaf, hand-drawn artist's book, white ink on black tissue paper, (530 x 800 mm, double-page spread), unique book. Photo: Ian Andrews