

Stellarium

Communicating contemporary astrophysics via contemporary dance? **Deb Ashby**, Director of Dance Manchester tells us how

There was a time when anatomy was a fascination for me. I devoured books on first aid, despite being somewhat squeamish about blood. The human biology department at the Natural History Museum absorbed me. Chemistry, too, lit a spark of interest but careers guidance recommended physics as a subject choice. Never was a burgeoning interest in the laws of the universe more deftly extinguished than in the calculations of energy, force and momentum.

Dance development, could be viewed, as a form of evangelism for dance as an art form: trying to convince more people of its innate, life enhancing value. Dance is creative and flexible, not only in its use of the body to express ideas but in the way the dance sector has become expert in communicating its benefits to a range of other agendas. On our mission, we offer dance in many guises. We advocate dance as prevention for obesity, to help ease the impacts of dementia, as a natural antidepressant, as a diversion from anti-social behaviour. So why not as an alternative way to teach science?

Manchester, as the European City of Science 2016, opened up an opportunity for Dance Manchester to work in partnership with the Science Engineering Education Research and Innovation Hub (SEERIH) at the University of Manchester. The result: Stellarium – a youth dance performance with the purpose of communicating contemporary astrophysics through contemporary dance.

To achieve this choreographer Bridget Fiske worked with astrophysicists, Dr Rowan Smith, Norman Lockyer Fellow at Jodrell Bank, University of Manchester and Dr Helen Mason of the University of Cambridge,

with additional support from Philippa Browning, Professor of Astrophysics at Jodrell Bank, University of Manchester. With an all-female team leading the project, and dance as a typically popular choice with girls, dance as a kinaesthetic learning tool has the potential to contribute positively to attracting more women into science.

A choreographic motif and dance tools were made to communicate the story of how stars are formed and ‘our star’, the Sun. The choreographer was guided by the expert knowledge of this team of astrophysicists, who ensured the science was conveyed accurately.

Nuclear fusion was represented by asking participants to find different ways to move around each other, whilst staying connected and incorporating moments of pulse, expressing the release of energy. Angular Momentum is related to the rotational motion of a body and it’s mass. The speed and direction of the rotation will stay the same unless another force acts on the body. So for example an ice skater, with very little resistance from the ice, will keep spinning around at the same rate, however if the ice skater opens out his/her arms, the distribution of mass changes and he/she will slow up when opening out the arms, but speed up when pulling them in. To represent the ‘angular momentum’ of the proto-stars in Stellarium, a movement was created that was able to support a continual turning action by the dancers, maintaining speed and turning only in one direction.

‘I found dance to be a particularly interesting medium for communicating science. The physical process of the dancer inventing moves and a choreography to represent the



scientific concepts forced us to really understand what was the most important part of the physics. In Stellarium this meant that we really broke down the process of forming a star, like our Sun, to communicate this in a unique and engaging way. It made me really think about my research, and it was a very emotional experience for me to see the resulting performance’ Dr Rowan J Smith, Norman Lockyer Fellow, Jodrell Bank Centre for Astrophysics, University of Manchester

Stellarium drew together participants from Derby High School, Bury; Falinge Park High School, Rochdale and Wright Robinson Sports College, East Manchester. The teachers from these schools, worked with their students to create sections in response to the dance motifs and tools provided, with the final performance work drawn together by choreographer Bridget Fiske.

Stellarium was performed at the Great Primary Science Share at Manchester Town Hall to more than 200 primary school children, and at Great Science Share Takeover for Secondary school students at the Museum of Science and Industry. This was alongside performances at major outdoor community events, including Manchester Day organised by Walk the Plank, and as part of Signatures Youth Dance Trail, a partnership project by Dance Manchester and the Lowry, presented as part of UDance, the national youth dance festival.

‘The students benefited greatly from this activity, which brought to life some quite deep scientific concepts. They communicated these ideas and scientific concepts via the medium of dance to a wider audience of other



(above)
Stellarium at
Manchester Day
2016 (right)
Dr Rowan
Smith (centre)
and dancers in
Stellarium.
Photos: Brian
Slater



students and the general public. It was exciting to participate in this ground breaking endeavour and to watch the performance, which the students clearly found exhilarating. Too often science is thought of as boring and 'nerdy'. Through Stellarium science was shown to be exciting, even thrilling for everyone involved and everyone who watched it.' Dr Helen Mason, University of Cambridge

EBacc has prioritised 'academic' subjects and cultivated a rhetoric that portrays the arts as second class, segregating the arts and sciences. In this environment, facilitating academic learning through creative dance may be a key additional weapon in our fight to retain dance as part of the educational offer.

Our Manchester – The Manchester Strategy, published in 2016, sets out a long term vision for Manchester's future arising from an extensive consultation process and offers a framework for action to be delivered by partners across the city, it says:

"Schools are the custodians of Manchester's next generation of inventors, scientists, teachers, nurses and high tech engineers. We need to connect our economic growth sectors with the core-education curriculum taught in our schools...Excellence in these subjects is key to securing employment in the jobs of tomorrow,

but we also recognise the value of combining this with arts and creativity."

It was reassuring to find that there were scientists and educators open to, and in some cases already embracing, the importance of the arts and the sciences as being not only equal but as subjects that complement each other. After all, would dance exist if it wasn't for energy, force and momentum?

'As a school which specialises in science and the arts, we relish the opportunity to engage in activities that merge artistic excellence and scientific discovery, and that is why we jumped at the chance to participate in Stellarium' Lynn Provoost, Derby High School, Bury

Dance Manchester is now piloting, Moving Space, a spin off from Stellarium providing other schools and colleges with the opportunity to supplement existing curriculum with this kinaesthetic approach. The Moving Space workshops have the added credibility of being underpinned with knowledge drawn from the expertise of university academics. Moving Space sessions to date, have been booked by Lostock College, Trafford; Walkden High School, Salford and Abraham Moss, Manchester. Engagement has not been only with dance students, but also with specific sessions for science students and in part resourced by

science department budgets. It is early days but it suggests the potential for cross fertilisation between subjects.

Fundamentally, creativity underpins successful and important work in both fields:

'What we've realised through this experience is that scientists and artists work in very similar ways. We all experiment, we all play with ideas, we all push the boundaries a little bit and we all need to communicate.' Dr Lynne Bianchi, Director of the Science Engineering Education Research and Innovation Hub at the University of Manchester

As this participatory project now becomes the inspiration for a new professional performance work, choreographed by Bridget Fiske, it should remind us that although dance rightly contributes successfully to multiple societal agendas, it is the existence and value of the art form of dance itself that allows for this possibility.

Info
Moving Space workshops for primary, secondary schools and colleges, communicating contemporary astrophysics via contemporary dance, are available to book. For more information contact +44 (0)161 232 7179 admin@dancemanchester.org.uk www.dancemanchester.org.uk