

## THE SCIENCE OF BEAUTY

### Report

The experience of beauty is a topic of very great interest to us all. Debates about its nature have traditionally been confined to the humanities and especially the philosophy of aesthetics. It is only relatively recently that neurobiology has addressed the topic of the neural determinants of aesthetic experience derived from different sources, from visual art to mathematics and moral beauty. While these studies have given very interesting results – in particular showing that there are specialized brain pathways for aesthetic judgment and that the “aesthetic emotion” aroused by different sources correlates with activity in the same parts of the emotional brain – they have also raised fundamental questions that are of interest to science and the humanities alike. One statistic demonstrates impressively the huge interest in a topic that combines different approaches to the study of beauty. The paper of Atiyah and Zeki on *The Experience of Mathematical Beauty and its Neural Correlates* published in February 2014 has so far been viewed around 110,000 times, a record in neuroscience and probably in mathematics as well.

The LMS was one of the sponsors of a two-day multidisciplinary conference on *The Science of Beauty* addressing these issues, which was held at the Royal Society of Edinburgh from 10 to 11 November 2015, and chaired by the RSE President Dame Jocelyn Bell Burnell. The scientific organizers were Sir Michael Atiyah (Trinity College, Cambridge and the University of Edinburgh) and the neuroscientist Semir Zeki (University College, London), who gathered a distinguished galaxy of speakers from the worlds of mathematics, neuroscience, philosophy, aesthetics, biology and physics:



Sir David Attenborough

- Sir Michael Atiyah *The Role of Beauty in Mathematics*
- Sir David Attenborough *Beauty in the Animal World*
- Angela Breitenbach *Philosophical Approaches to Beauty in Mathematics*
- Nicky Clayton and Clive Wilkins *Conversation without Words*
- Robbert Dijkgraaf *Beauty in Physics and Mathematics*
- Cinzia Di Dio *The Neurobiology of Beauty, as Related to Proportion*
- Beatrice de Gelder *The Perception of Human Beauty*



Sir Michael Atiyah, Sir David Attenborough,  
Sir Roger Penrose



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Dame Jocelyn Bell Burnell, Sir Michael Atiyah

- Gordon Graham *Beauty and Excellence in Scottish Philosophical Aesthetics*
- Tomohiro Ishizu *The Neurobiology of Aesthetic Judgements*
- Winfried Menninghaus *Literature and Empirical Aesthetics*
- Sir Roger Penrose *The Role of Art in Mathematics*
- Michael Trimble *The Beauty of Tears and Tears of Beauty: Neurobiology of Sorrow*
- Semir Zeki *Neural Correlates of the Experience of Beauty, Including Mathematical Beauty*

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The conference concluded with a concert at the church of St Andrew and St George *Going to Ground: Musical Magic from Pervasive Patterns* by Oscar Garcia-Prada countertenor and Din Ghani lutes.

Unfortunately, David Mumford could not attend in person, but the text of his planned lecture on *Math & Beauty & Brain Areas* was distributed at the conference.

The meeting was a great success, with many thought-provoking contributions from participants with widely differing intellectual backgrounds. The attendance was in excess of 100, including many students. The presentation by David Attenborough was a particular highlight: as he pointed out Alfred Russel Wallace believed that it was absurd to attribute aesthetic appreciation to birds, while Charles Darwin thought otherwise. Video sequences of beautiful animal behaviour persuaded the audience that Darwin was right.

The RSE website <https://www.royalsoced.org.uk/> contains detailed reports on the talks, including some videos.

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Group photo in the Scott Room of the Royal Society of Edinburgh