

Weekend Courses 2023-24

The role of beauty in scientific practice

Start date: 26 April 2024 **End date:** 28 April 2024

Venue: Madingley Hall
Madingley
Cambridge
CB23 8AQ

Tutor: Dr Milena Ivanova **Course Code:** 2324NRX033

Tutor biography

Dr Milena Ivanova is a philosopher specialising in the aesthetics of science. She lectures at the Leverhulme Centre for the Future of Intelligence and the Institute for Continuing Education at the University of Cambridge, where she is also a ByeFellow, Tutor and Director of Studies at Fitzwilliam College. She studied History and Philosophy of Science at the University of Athens, before moving for her PhD to the University of Bristol, where she was awarded a British Society for Philosophy of Science Studentship as well as Royal Institute for Philosophy Jacobsen Fellowship.

Dr Ivanova is interested in scientific reasoning, the goals of science and the value that shape scientific practice. Currently she is working on a project on scientific experimentation, investigating how aesthetic values enter in the construction, evaluation and reception of experiments. She is the author of *Duhem and Holism*, published with Cambridge University Press, which explores how scientists learn from experiment. She has also co-edited *The Aesthetics of Science: Beauty, Imagination and Understanding*, published in 2020, and *The Aesthetics of Scientific Experiments*, published in 2023, both published by Routledge.

Course programme

Friday

Please plan to arrive between 16:30 and 18:30. You can meet other course members in the Terrace Bar which opens at 18:15. Tea and coffee making facilities are available in the study bedrooms.

19:00 Dinner

20:30 – 22:00 Nature, the designer

22:00 Terrace Bar open for informal discussion

Saturday

07:30 Breakfast (for residents only)

09:00 – 10:30 What does beauty have to do with science?

10:30 Coffee

11:00 – 12:30 Beauty is truth, truth is beauty

13:00 Lunch

14:00 – 16:00 Free time

16:00 Tea

16:30 – 18:00 When beauty leads astray

18:00 – 18:30 Free time

18:30 Dinner

20:00 – 21:30 The beautiful experiment

21:30 Terrace Bar open for informal discussion

Sunday

07:30 Breakfast (for residents only)

09:00 – 10:30 Can ugliness help science?

10:30 Coffee

11:00 – 12:30 Is there a place for beauty in automated science?

12:45 Lunch

The course will disperse after lunch

Course syllabus

Aims:

The course will allow you to:

- gain deeper understanding of scientific practice and the values that guide and shape it
- critically reflect on philosophical arguments often assumed in scientific reasoning
- reflect on the role of beauty and creativity in science and the similarities between artistic and scientific practises

Summary of content:

Scientists often praise scientific products, from theories and images to experiments and simulations, for their aesthetic value. Scientific practise reveals that scientists use aesthetic values in theory choice, in the preparation of evidence and often aesthetic values are not simply taken as methodological tools but as indicators of the theory's truth. But what is beauty for scientists and are aesthetic values fixed or do they change with the development of science? Is beauty to be trusted or could it lead us astray?

In this course we will investigate central themes in the aesthetics of science. We will reflect critically on the concept of beauty and how we come to regard certain properties as aesthetically significant. We will consider whether our aesthetic tastes are stable or subject to change and what this implies for whether beauty can be trusted in science. Could beauty be misleading scientists, directing them in unproductive directions? Or could beauty be evidence for a theory's truth? We will explore the similarities between scientists and artists, studying how creativity and the aesthetic sensibility guides the reconstruction of fossils, the design of experiments and preparation of images. Last, we will reflect on whether the automation of many scientific processes that we currently value for displaying human creativity and aesthetic sense will lead to a future of aesthetically impoverished science.

Presentation of the course:

You are welcome to familiarise yourself with the topic by checking out some of the readings or listening to podcasts with interviews on the topic. However, no prior knowledge of the topic is required for this course. The course will be taught in a creative way, including mini lectures, group discussions and working on particular questions as a group.

As a result of the course, within the constraints of the time available, you should be able to:

- understand the development of classical and contemporary ways of understanding science and their social significance
- understand the close relationships between studying the history of science and the philosophical analysis of science
- critically analyse concepts in science
- understand how values shape scientific practice and critically reflect on their place in science

Reading and resources list

There are no compulsory readings for this course. However, you may find the below recommended reading list of interest to supplement your course.

Milena Ivanova, *When is a scientific experiment like a work of art?*, Aeon Magazine (2021)
<https://aeon.co/essays/when-is-a-scientific-experiment-like-a-beautiful-work-of-art>

Sabine Hossenfelder, *Beauty is truth, truth is beauty, and other lies of physics*, Aeon Magazine (2018)
<https://aeon.co/ideas/beauty-is-truth-truth-is-beauty-and-other-lies-of-physics>

Online resources:

The podcast *Beauty at Work*. Particular episodes to see:

How Beauty Leads Science Astray with Dr Sabine Hossenfelder
<https://www.youtube.com/watch?v=9-eAl2anBbE&t=4s>

Can Viruses be Beautiful? with Dr Mark Painter
https://www.youtube.com/watch?v=JzOJqxc_yS0&t=2s

Does nature prefer symmetry? Beauty at the intersection of physics and biology with Dr. Ard Louis
https://www.youtube.com/watch?v=avMvuk_hPVA

Note: Institute of Continuing Education (ICE) students are entitled to 20% discount on books published by Cambridge University Press (CUP) which are purchased at the Press bookshop, 1 Trinity Street, Cambridge (Mon-Sat 9am – 5:30pm, Sun 11am – 5pm). A letter or email confirming acceptance on to a current ICE course should be taken as evidence of enrolment.

(Information correct as of 15 May 2023)