

Science in the age of AI

Professor Alison Noble CBE FRS
Foreign Secretary, The Royal Society

European Research Area Stakeholder
Conference, 18th September 2024.







Steering committee

Chair

Professor Alison Noble CBE FRS FREng – Vice President of the Royal Society and Technikos Professor of Biomedical Engineering, University of Oxford.

Members

Professor Paul Beasley – Head of Research and Development, Siemens.

Dr Peter Dayan FRS – Director, Max Planck Institute for Biological Cybernetics.

Professor Sabina Leonelli – Professor of Philosophy and History of Science, University of Exeter.

Alistair Nolan – Senior Policy Analyst, Organisation for Economic Co-operation and Development.

Dr Philip Quinlan – Director of Health Informatics, University of Nottingham.

Professor Abigail Sellen FRS – Distinguished Scientist and Lab Director, Microsoft Research.

Professor Rossi Setchi – Professor in High Value Manufacturing, Cardiff University.

Kelly Vere – Director of Technical Strategy, University of Nottingham

Methodology

30+ interviews

5 roundtables

- ▶ Immersive technologies (2022)
- ▶ Reproducibility (May 2023)
- ▶ AI and climate science (June 2023)
- ▶ Interdisciplinarity (July 2023)
- ▶ LLMs and science (July 2023)

2 AI safety workshops (October 2023)

- ▶ Horizon scanning AI safety risks in science
- ▶ Red teaming on AI-generated disinformation

2 international workshops (Sept – Nov 23)

- ▶ RS-NAS Forum on Researcher Access to Data, Washington
- ▶ RS-CAS workshop on AI Ethics, Beijing

3 commissioned studies

- ▶ Taxonomy of AI technologies
- ▶ Patent landscape of AI technologies
- ▶ Historical review





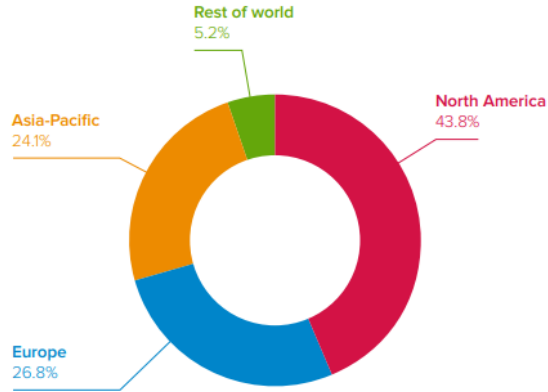
Key findings

1. AI applications can be found across all STEM fields.
2. High quality data is foundational for AI applications.
3. China, USA, Japan, and South Korea are dominating in terms of patent applications related to AI for science.
4. Companies such as Alphabet, Siemens, IBM, and Samsung appear to exhibit considerable influence.
5. The black-box, and potentially proprietary, nature of AI tools is limiting the reproducibility of AI-based research.
6. Interdisciplinary collaboration is essential to bridge skills gaps.
7. Generative AI tools hold promise for expediting routine scientific tasks.

Machine learning in the life sciences

FIGURE 4

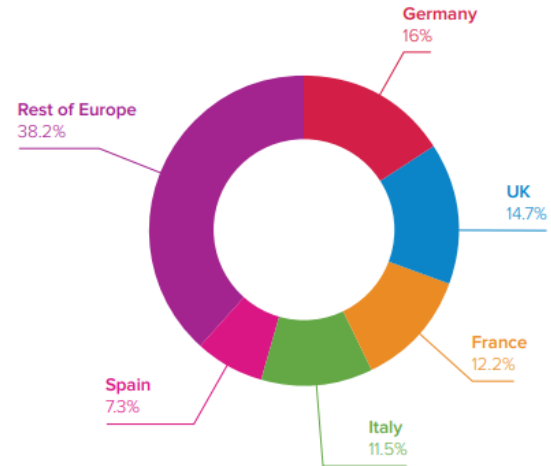
Global Market Shares of Machine Learning in the Life Sciences, by Region, 2021 (%)



Source: BCC Research.

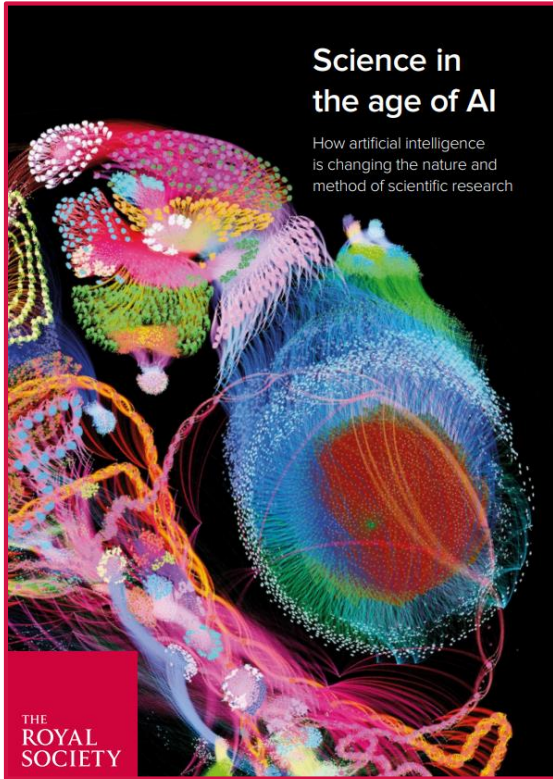
FIGURE 5

European Market Shares of Machine Learning in the Life Sciences, by Country, 2021 (%)



Source: BCC Research.

Areas for action



1

Foster interdisciplinary collaboration

2

Improve access to essential AI infrastructure

3

Ensure AI-based research meets open science principles and practices

The UK picture

- ▶ New government to announce its first budget in October.
- ▶ Post-election decision to cancel £800m funding for an exascale computer in Edinburgh and £500m for the AI Research Resource.
- ▶ UK Research and Innovation (UKRI) has invested in AI Centres for Doctoral Training (~£217m since 2018), several regional AI hubs (~£100m), as well as initiatives to tackle emerging concerns related to AI (~£31m).
- ▶ UK Government to publish an AI Opportunities Plan this year to set out new roadmap on AI for the UK.





For more information

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