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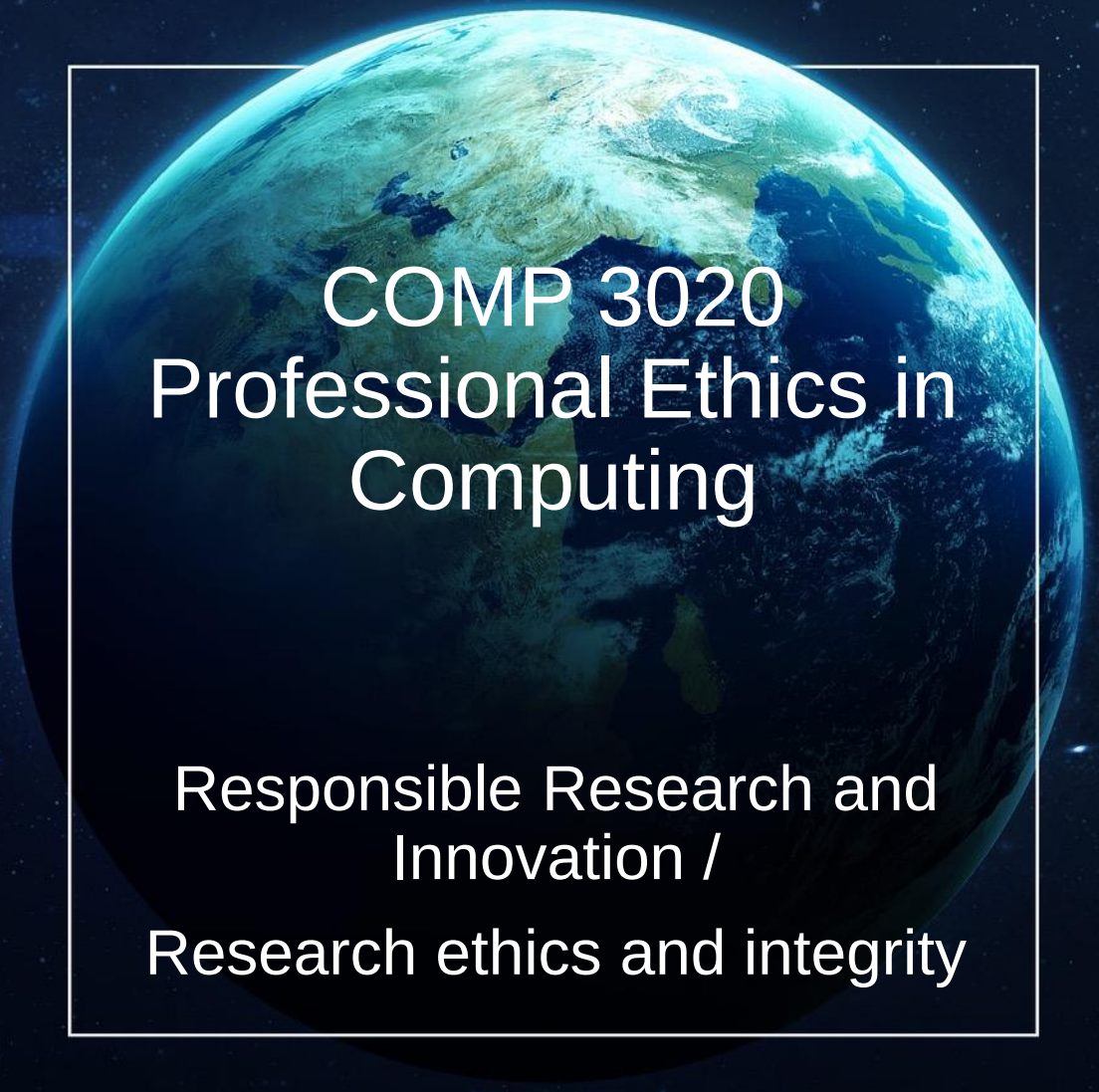
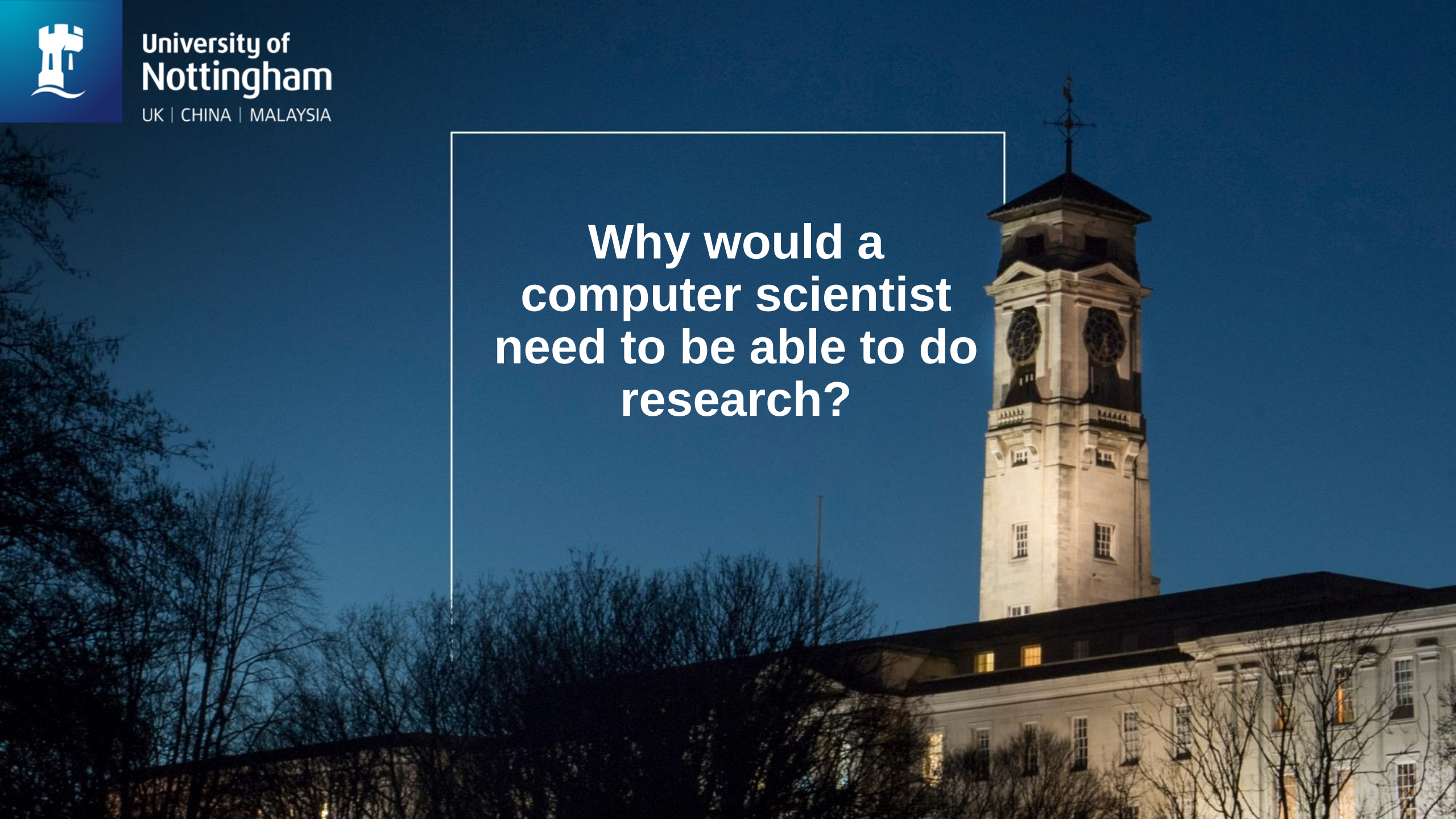


COMP 3020 Professional Ethics in Computing

Responsible Research and Innovation /

Research ethics and integrity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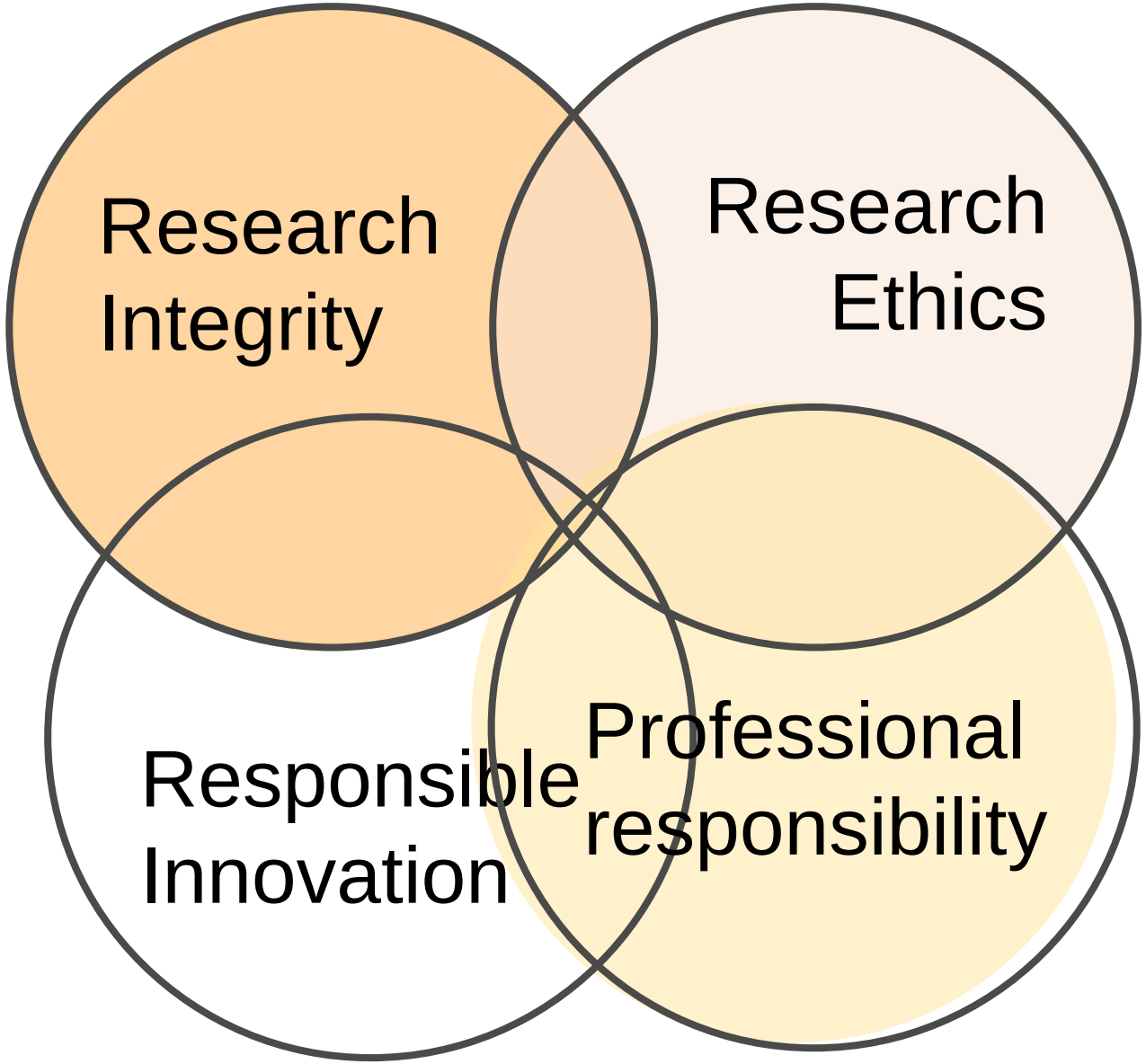
Why would a computer scientist need to be able to do research?

Research in Computer Science

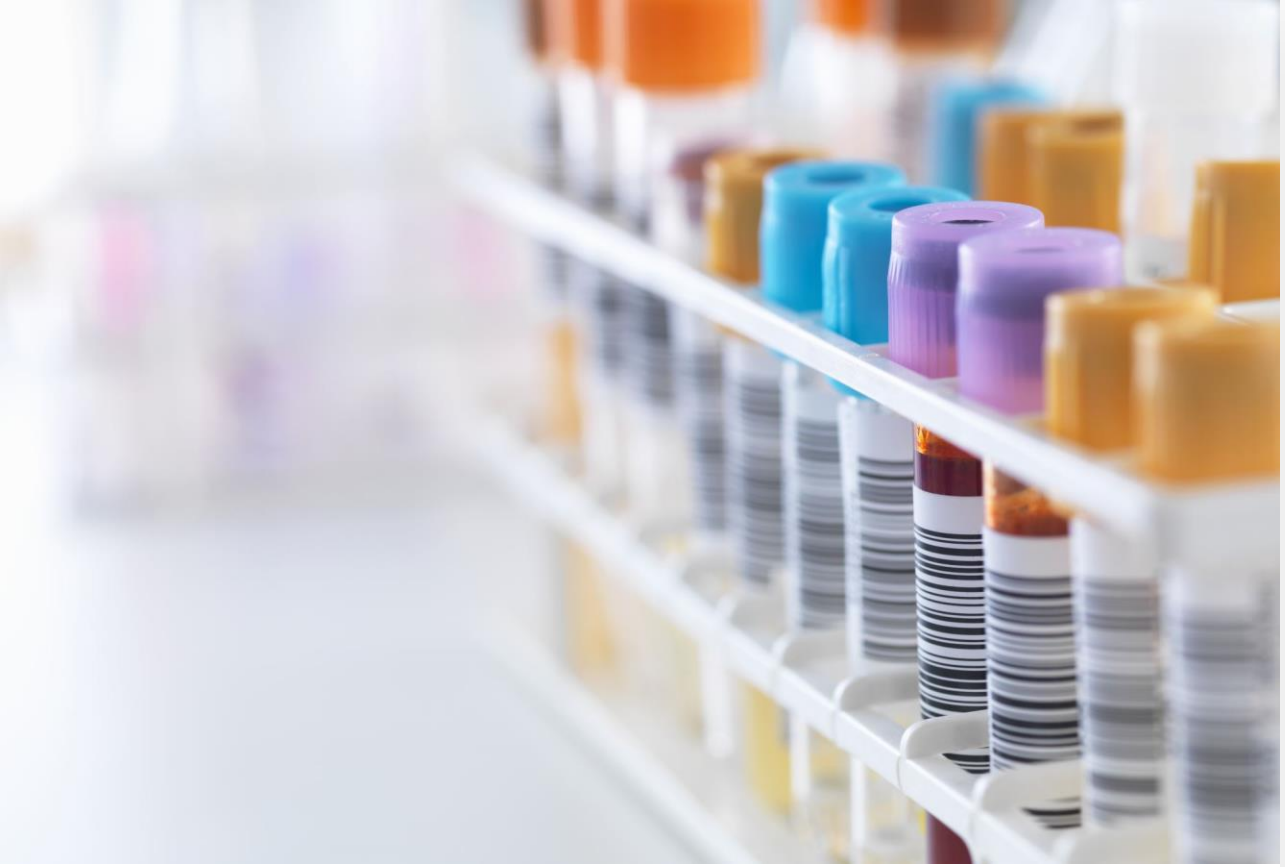
- Research allows us to understand the world better and develop new technology.
- The field of Computer Science is developing very fast with many new innovations in recent years.
- Research conducted in University.
- 2024 Nobel Prize in Physics went to two computer scientists, John J. Hopfield and Geoffrey E. Hinton, for foundational discoveries and inventions that enable machine learning with artificial neural networks.
- Research also conducted increasingly in Industry:
  Google Deepmind, Microsoft OpenAI, Baidu Research…
- Even in a smaller firm, a computer programmer may need to do some research:
  e.g. Optimal scheduling system for van drivers in a medium-size business.

Research ethics


Research Integrity
Research Ethics
Responsible Innovation
Professional responsibility

Nuremberg Code

- Framed during the 1947 Nuremberg trials of Nazi war crimes,
  - in particular USA vs Brandt, which focused on physicians who conducted inhumane and unethical human experiments in concentration camps
- Formalised principles of legitimate medical research, including:
  - "The **voluntary consent of** the human subject is absolutely essential"
  - "… to yield **fruitful results** for the good of society"
  - "**avoid all unnecessary physical and mental suffering and injury**"
  - "the human subject should be **at liberty to bring the experiment to an end**"
- Leads eventually to…



Research Ethics & Integrity

- UK: Concordat to Support Research Integrity (signed 2012), applies to all UK Universities, including Nottingham
  - https://www.universitiesuk.ac.uk/topics/research-and-innovation/concordat-support-research-integrity
  - Note, Research Integrity includes but is broader than research ethics considered here,
  - E.g. not falsifying or misrepresenting results, recognising individual's contributions to research, responsible use of public funds, reported problems, …
- All UK research funders require consideration of Research Ethics.
- Chinese legislation requires researchers in China to take account of Research Ethics.

Code of Research Conduct and Research Ethics – summary (2)

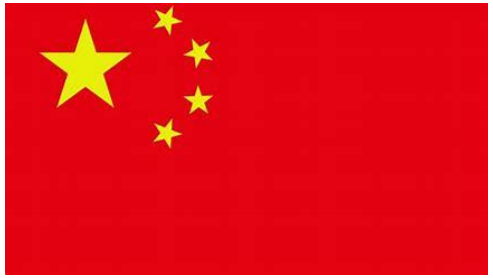
It covers a lot of ground, including:

- **Data**, data management, especially **personal data**
  - Including compliance with GDPR/Data Protection Act
- Insurance
- **International research**
- Research involving **human participants**
  - Including but not only medical research
- Research involving animals
- Health and safety
- …

Considerations for Research Participant Information

- The research
  - Aims and objectives of the research
  - Funder
  - Governance
- Taking part (explain)
- Risks and mitigation
- Data processing
- Storage and retention
- Third party recipients, services, transfers
- Legal rights and authorship
- Ethical rights
- Consent to participate

Considerations for Data Use in China



- In China, the Civil Law provides that natural person's data are protected by law.
- The principal legislation providing for data protection includes the Cybersecurity Law of the People's Republic of China (implemented on June 1, 2017), the Data Security Law (implemented on September 1, 2021) and the Personal Information Protection Law of the People's Republic of China (issued on April 29, 2021).
- Any research at UNNC must be consistent with the provisions of these laws.
- When researchers collect secondary data from any third party (e.g. commercial or public entities that collect primary data) supporting documentation (e.g. the contract or description on how the third party collects data) should be available to justify that the third party's data collection and the data usage by the researchers follow the Civil Law of China.
- Scientific data requirements in China should adhere to the "Regulation on Scientific Data" (General Office of the State Council of PRC, 17/03/2018) policy.
- Unless otherwise mandated by the conditions of project funding, data generated in projects funded by the Chinese government sources shall follow open access policy and shall be deposited with a suitable UNNC repository before being sent out of China.

From University of Nottingham Code of Research Conduct and Research Ethics

Principles of research integrity

Research integrity means conducting research in a way which allows others to have trust and confidence in the methods used and the findings that result from this. Within the University, conducting research with integrity also means meeting the professional standards expected of our researchers.

University of Bath definition of Research Integrity
https://www.bath.ac.uk/corporate-information/definition-of-research-integrity/

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Principles of research integrity

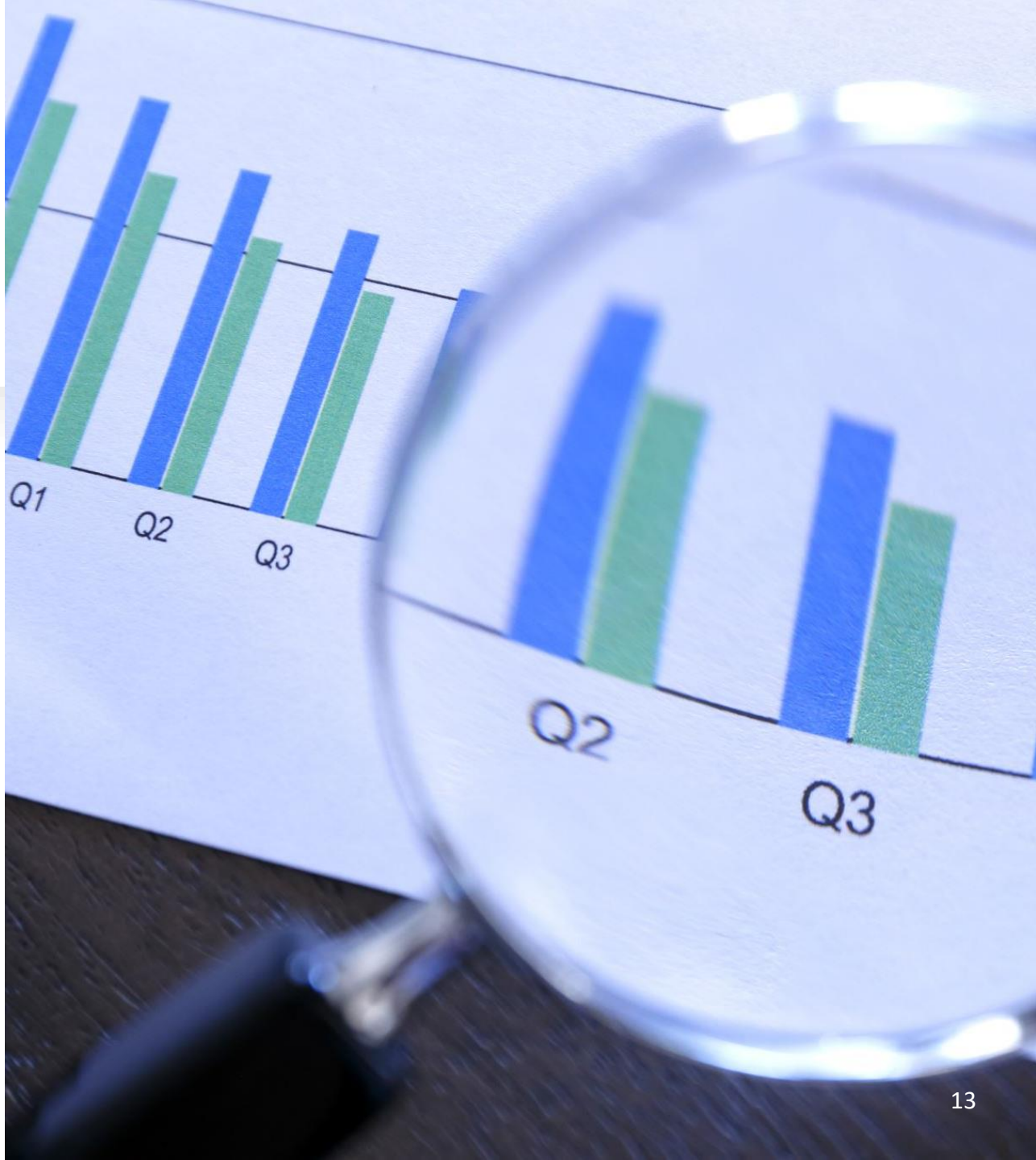
The scientific enterprise is built on a foundation of **trust**. Society trusts that scientific research results are an honest and accurate reflection of a researcher's work. Researchers equally trust that their colleagues have gathered data carefully, have used appropriate analytic and statistical techniques, have reported their results accurately, and have treated the work of other researchers with respect.

On Being a Scientist: A Guide to Responsible Conduct in Research (2009), Committee on Science, Engineering, and Public Policy https://doi.org/10.17226/12192

ORBIT

Issues and principles of research integrity

- Honesty and Truthfulness
- Objectivity
- Data Transparency
- Informed Consent
- Confidentiality
- Plagiarism Avoidance
- Authorship and Contributorship
- Conflicts of Interest
- Research Design and Methodology
- Reproducibility and Replicability
- Peer Review



Principles of research integrity

Research integrity may be defined as

- **Active** adherence to the ethical principles
- And professional standards
- Essential for the responsible practice of research.

By active adherence we mean adoption of the principles and practices as a personal credo, not simply accepting them as impositions by rulemakers.

By ethical principles we mean honesty, the golden rule, trustworthiness, and high regard for the scientific record.

Responsible Conduct of Research on Humans, Office of Research Integrity, HHS.gov
U.S. Department of Health & Human Services
https://ori.hhs.gov/education/products/ucla/chapter1/page02.htm

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Responsible Research and Innovation (RRI)

The AREA Framework

Anticipate – describing and analysing the impacts that might arise.

Reflect – reflecting on the purposes of, motivations for and potential implications of the research.

Engage – opening up such visions, impacts and questioning to broader deliberation, dialogue, engagement.

Act – using these processes to influence the direction and trajectory of the research and innovation process itself.

EPSRC

Pioneering research and skills

RRI - The 4 Ps

Process: covers all activities in preparing research, undertaking data collection and analysis, storage and presentation of data and interaction with respondents.

Product: can refer to products or services. It includes the consequences of use as well as misuse of research products and the impact that research has on the natural and social environment.

Purpose: covers the question why research is undertaken at all.

People: are at the heart of RRI and need to be explicitly considered.

Limits of RRI

RRI cannot

- Predict the future
- Avoid all problems arising from research, innovation and technology development
- Eliminate value conflicts
- Relieve researchers / funders / industry from responsibility
- Be a panacea

RRI can

- Stimulate an intelligent conversation about R&I
- Facilitate second order reflexivity

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Seminar w/c 28 October:

Write a data collection and usage proposal for a research proposal