

THE THEORY AND PRACTICE OF RRI

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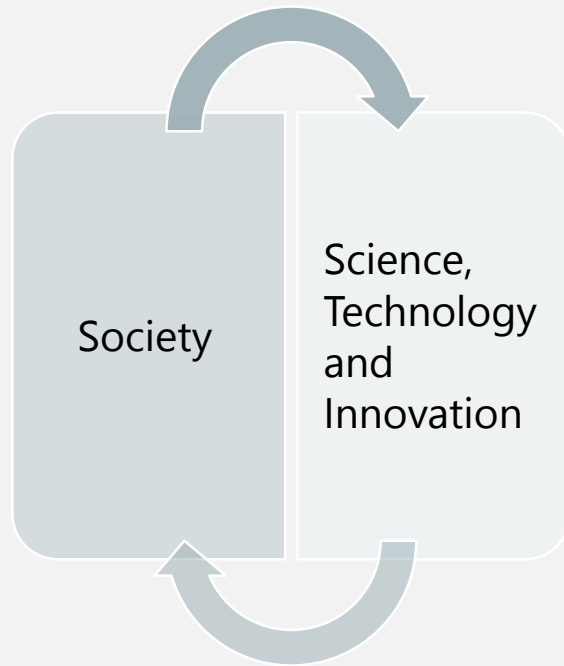
Manchester Institute of Innovation Research

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STRUCTURE OF THIS TALK

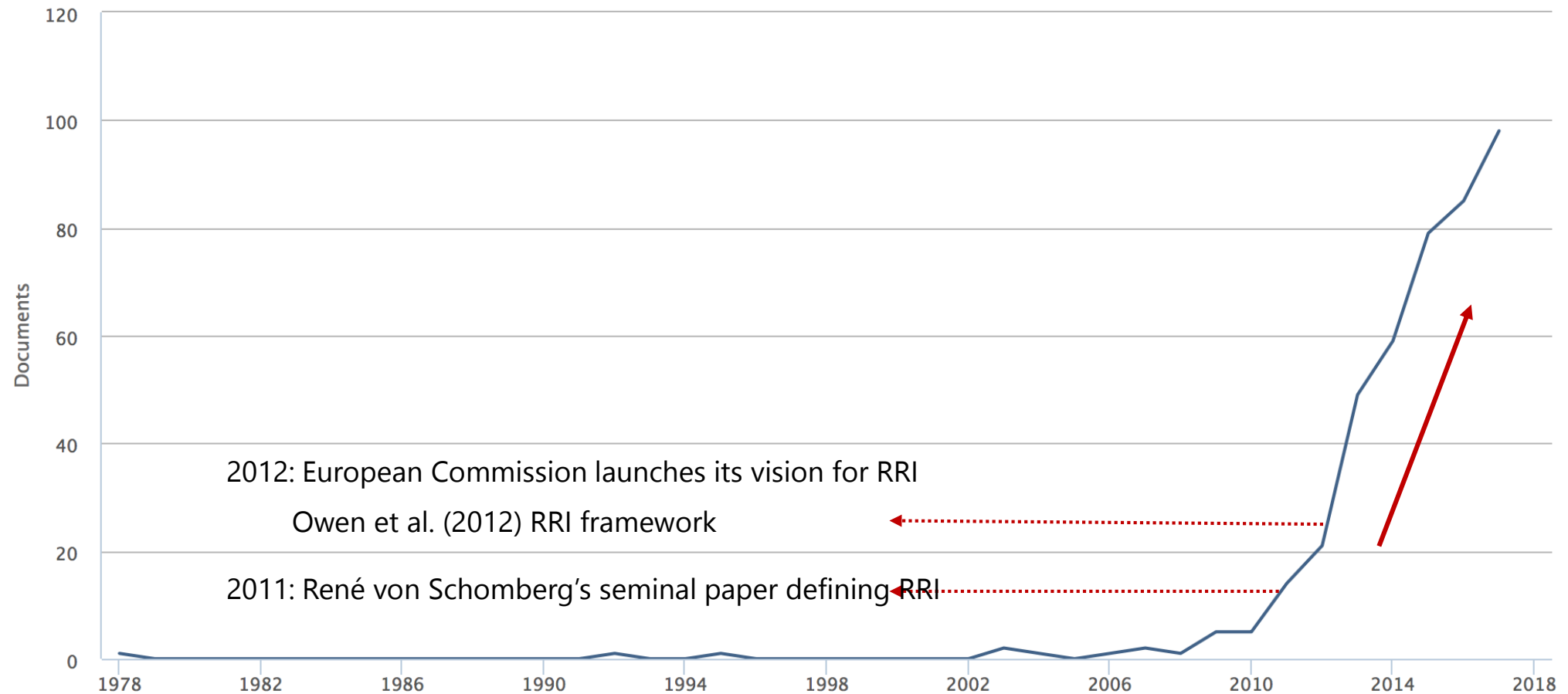
1. The background of 'academic' RRI
2. Representations of RRI in academia
3. Experiments on the institutionalisation and 'operationalisation' of RRI

THE BACKGROUND OF RRI

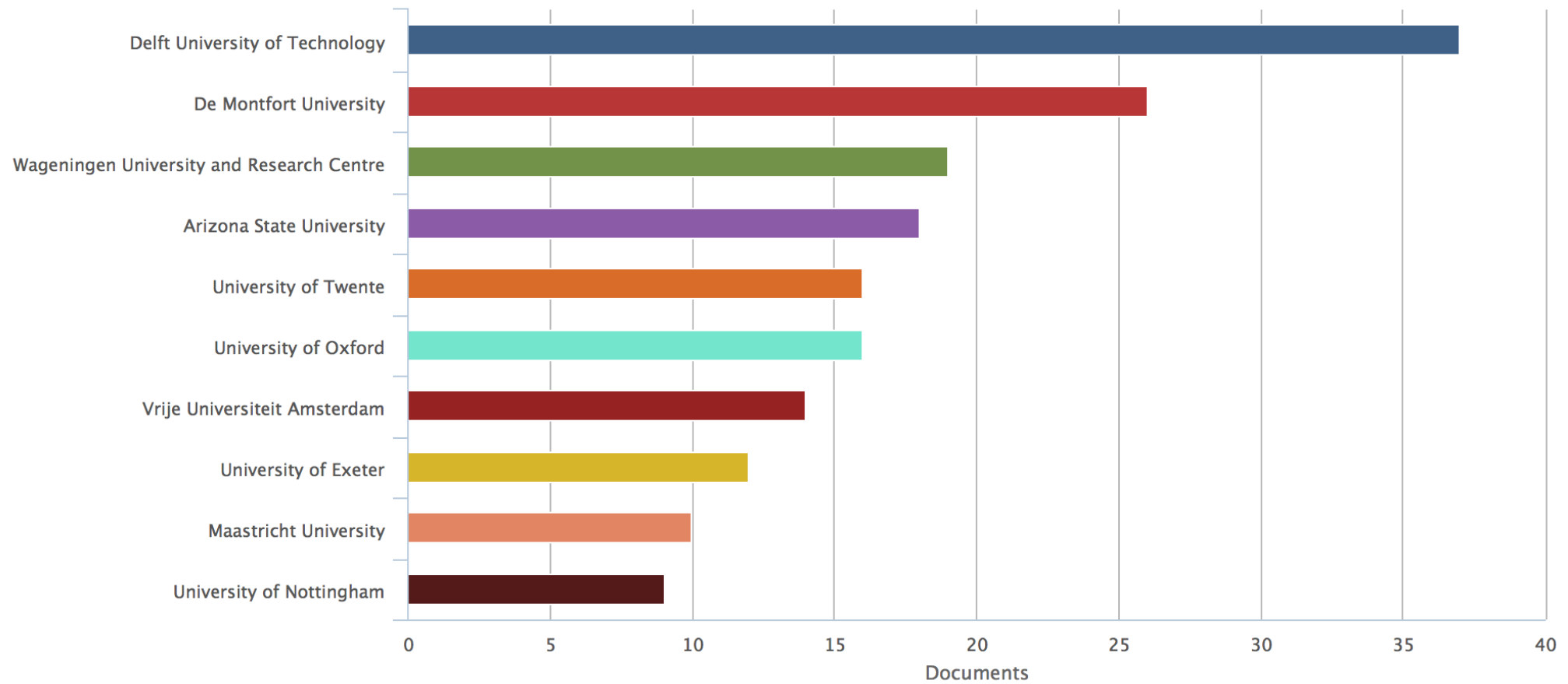


The development of S,T&I and the generation of scientific evidence to inform decision-making are dependent on and shaped by people's values, concerns and interests.

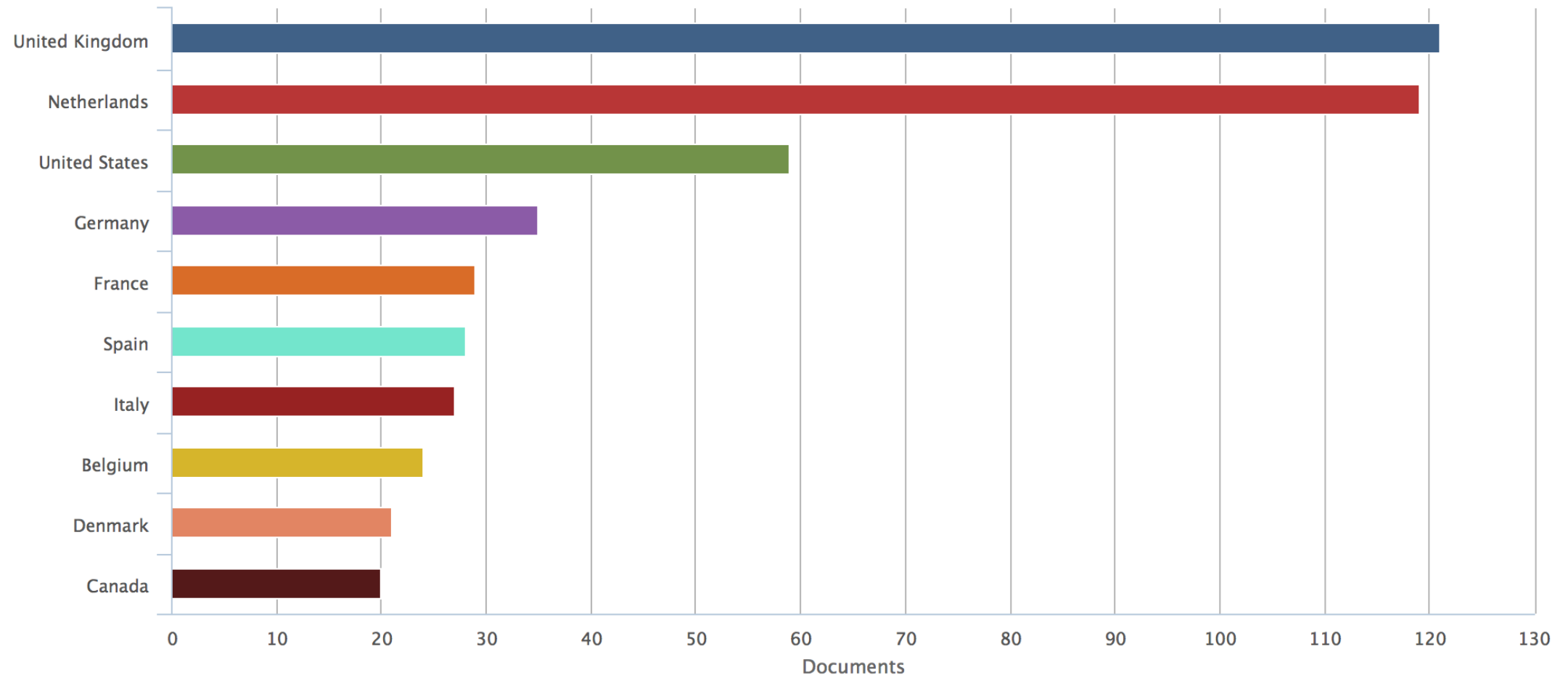
It is therefore fundamental to reflect on the politics of knowledge production and to open up assessment processes to diverse perspectives in early stages of technological development.



Search on Scopus (March 2018): "responsible innovation" or "responsible research and innovation" (TITLE-ABS-KEY)
Total of 425 (until Dec/2017) or 448 results (including 2018)



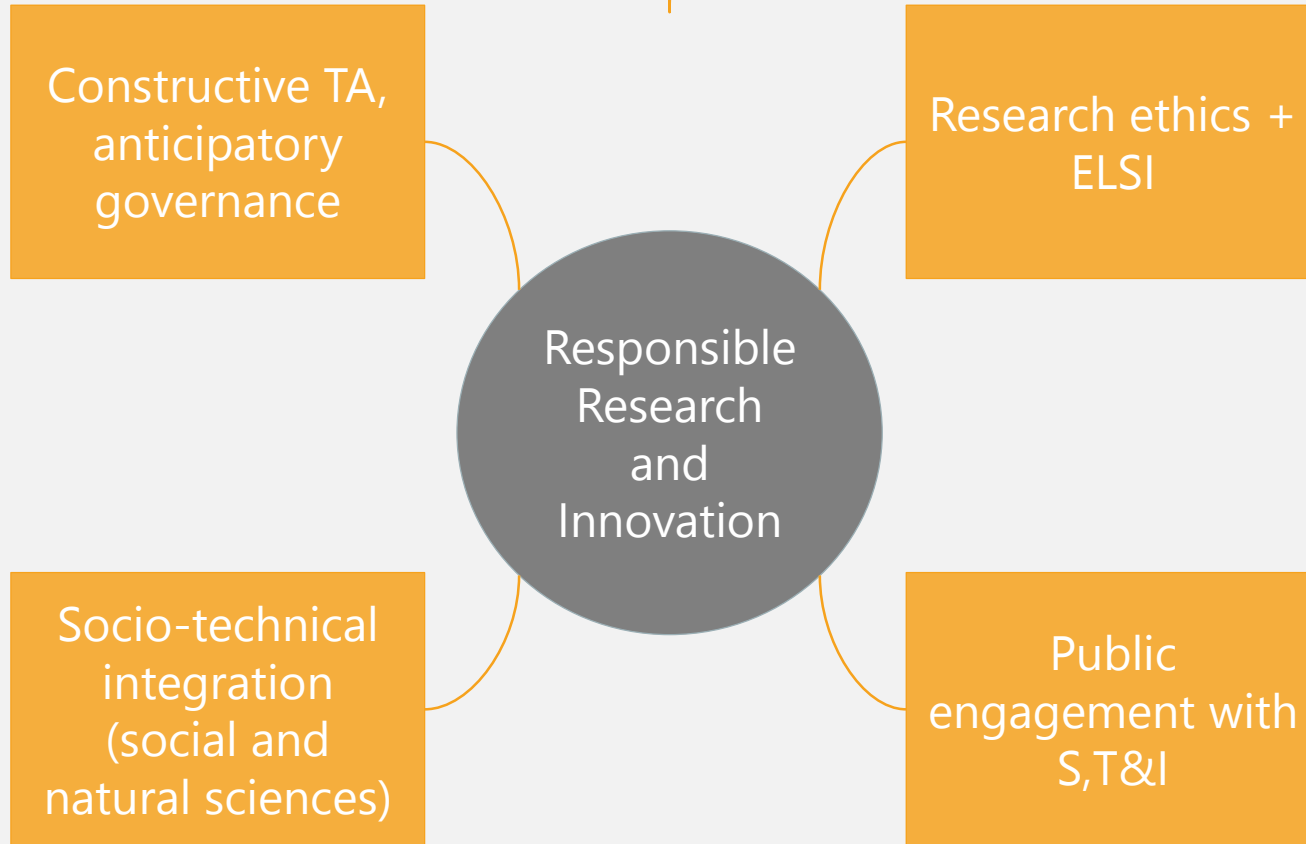
Authors' affiliations



Countries

Actors involved: scientists, citizens, industry stakeholders, policy-makers... (principle of co-responsibility)

RRI as an 'integrative' concept



"Ethically problematically" areas of S,T&I

ACADEMIC REPRESENTATIONS OF RRI

How is RRI being defined amongst academics?

What are the motivations or main objectives of RRI?

Which links to theories have been established or are informing RRI?

What methods and tools are being proposed for the operationalisation of RRI?

Motivations (objectives of RRI)	Theoretical conceptualisations	Translations into practice
To develop <i>better</i> or <i>novel</i> practice	Emerging specialised 'RRI literature'	'Integrated' approaches
To deliver societal benefits	Ethical traditions (e.g. bioethics)	Evaluation or assessment
To grasp the impacts of technologies	Science and technology studies	Policy and governance mechanisms
To promote public acceptance	Technology assessment	
Public policy as driver	Management, organisation and innovation governance studies	
	Public engagement and science communication	
	Risk assessment	
	Sustainability studies	

RRI is a transparent and interactive process that spans and acknowledges mutual responsibility across different actors aiming to address the ethical acceptability, sustainability and societal desirability of research and innovation with a focus on how to achieve important positive impacts (the 'right' impacts).

Based on the view of EC officer **Rene von Schomberg**,
quoted by several authors.

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STS

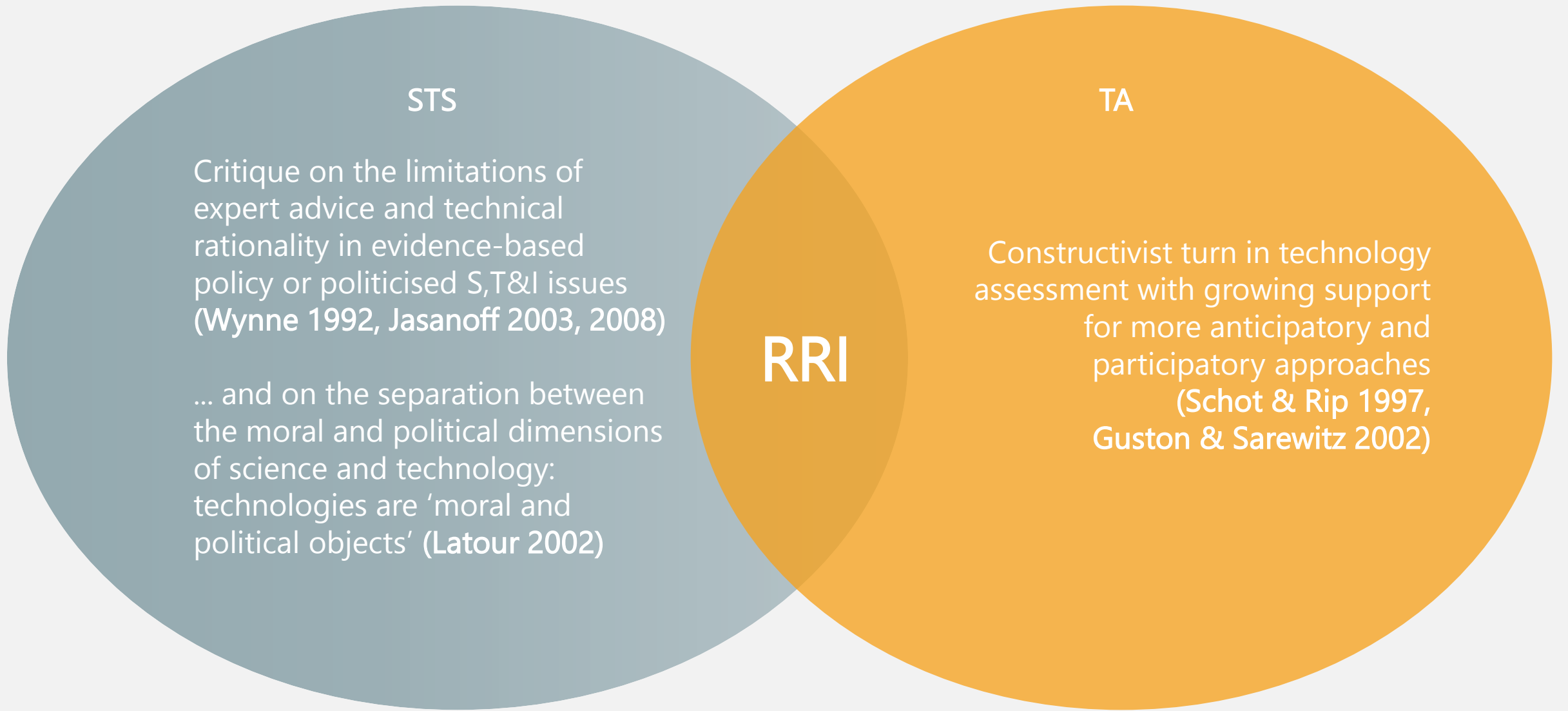
Critique on the limitations of expert advice and technical rationality in evidence-based policy or politicised S,T&I issues (Wynne 1992, Jasanoff 2003, 2008)

... and on the separation between the moral and political dimensions of science and technology: technologies are 'moral and political objects' (Latour 2002)

TA

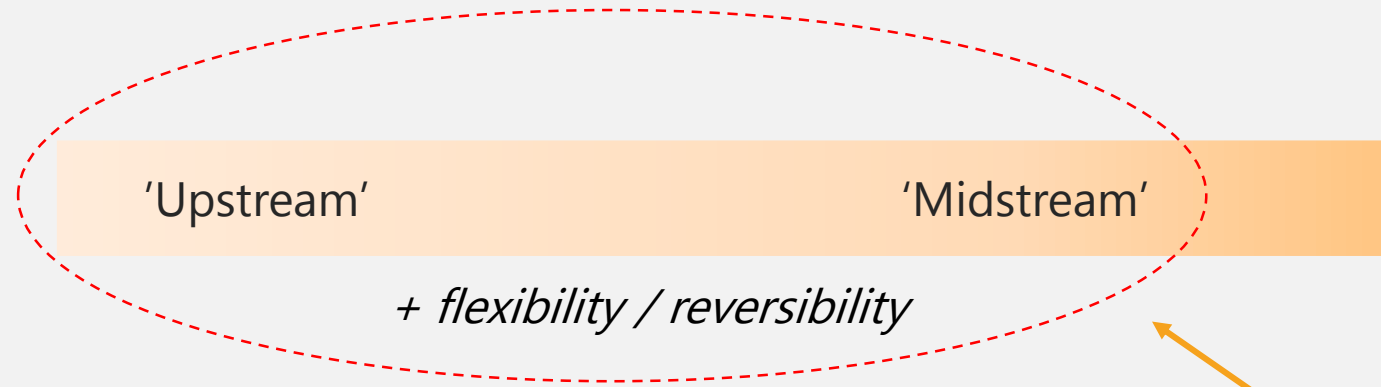
Constructivist turn in technology assessment with growing support for more anticipatory and participatory approaches (Schot & Rip 1997, Guston & Sarewitz 2002)

RRI



Anticipation and 'modulation'

Mitigation



"When change is easy, the need for it cannot be foreseen; when the need for change is apparent, change has become expensive, difficult and time consuming."
D. Collingridge (1980)

Co-construction
Deliberation
Participation

Problem framing
Agenda definition
Mobilisation of expectations and promises
Early stages of technological development

Focus	Approaches and methods
Identifying and assessing the ethical aspects of S,T&I	Codes of conduct; codes of ethics; ethical TA; ethical impact assessment; ethics review; value-sensitive design
Identifying and assessing the risks and potential impacts of S,T&I	Constructive TA; cost-benefit analysis; foresight; horizon scanning; impact assessment; life-cycle assessment; risk assessment; scenario planning; socio- literary techniques; vision assessment
Socio-technical integration and interdisciplinarity in research and innovation	Constructive TA; ethnographic studies; foresight activities; horizon scanning; midstream modulation; real-time TA
Public and stakeholder engagement with S,T&I	Citizens' juries/panels; consensus conferences; constructive TA; deliberative mapping; deliberative polling; focus groups; participatory research projects (e.g. community-based approaches); participatory TA; public advisory boards; public opinion polling; roadmapping, multi- level analysis and socio- technical scenarios (as pre-engagement tools); science cafe; science shops; upstream engagement; user-centred design.

Adapted from Ribeiro et al. (2017)

Policy and governance mechanisms

Laws and regulations

International declarations and protocols

Guidelines/frameworks by funding agencies
and professional societies

Education and training

Policy and governance mechanisms

Laws and regulations

International declarations and protocols

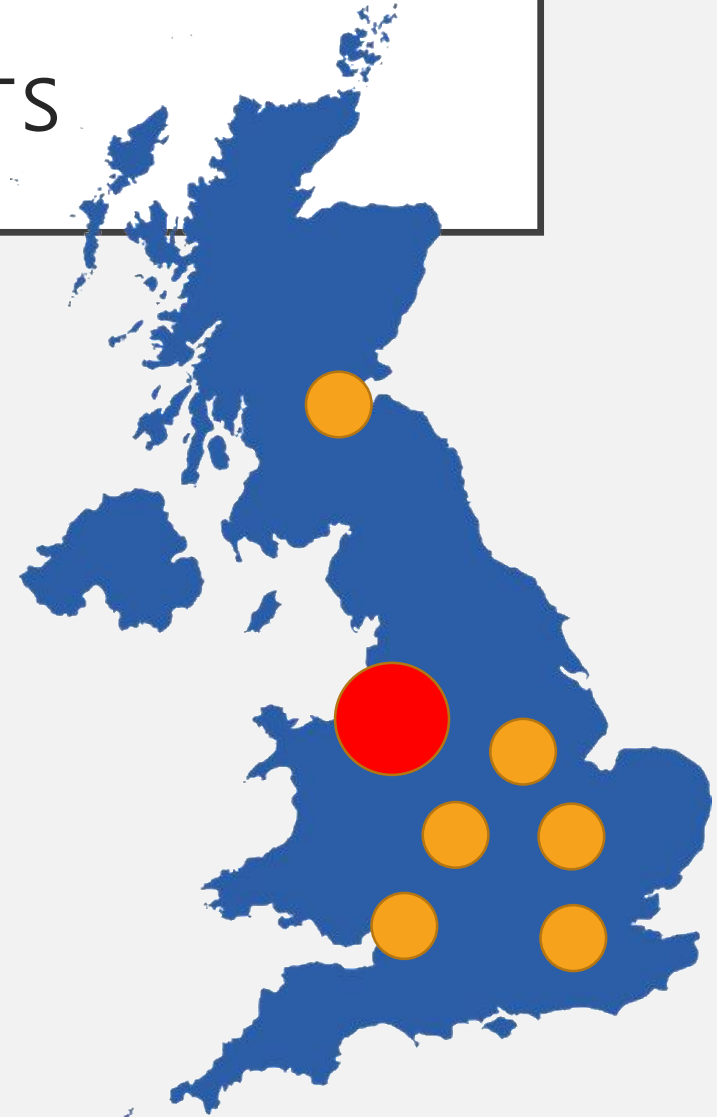
**Guidelines/frameworks by funding agencies
and professional societies**

Education and training

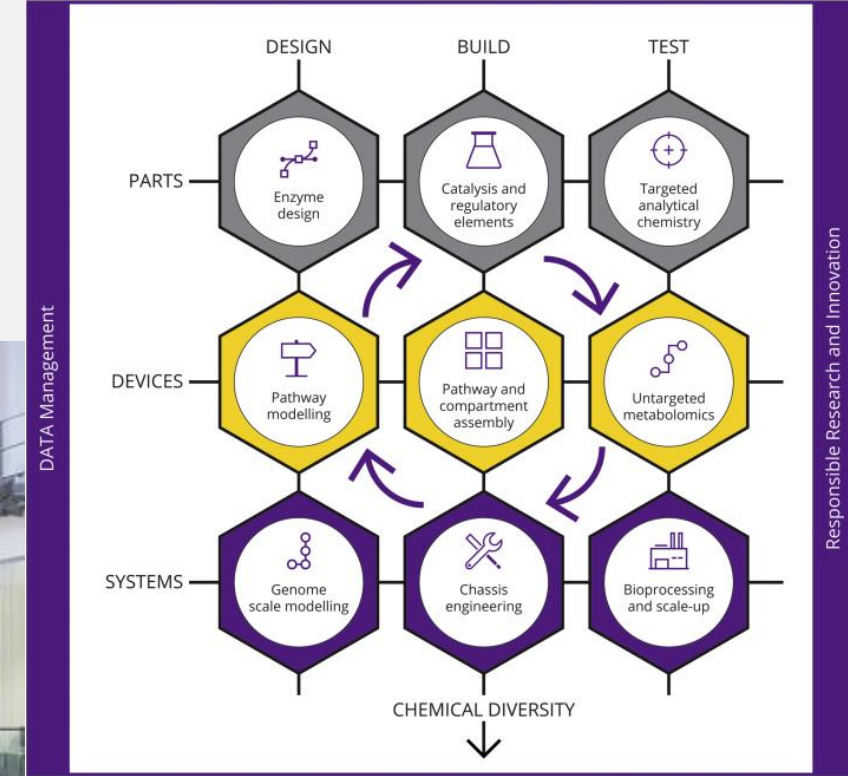
***Soft* institutionalisation**

RRI EXPERIMENTS

- 2013-2014 calls from EPSRC/BBSRC
- '**RRI teams**' become embedded across multidisciplinary Synthetic Biology Research Centres (SBRCs) in the UK
- Focus on developing and implementing RRI frameworks through collaborative work and engagement between social scientists, natural scientists and engineers in the emerging field of synthetic biology



Experimenting with RRI in SYNBIOCHEM, Manchester Institute of Biotechnology



	FUNDING	RESEARCH	INNOVATION	SKILLS	NEWS, EVENTS AND PUBLICATIONS	ABOUT US
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Research	>
Framework for Responsible Innovation	>
Anticipate, reflect, engage and act (AREA)	
Support	
Expectations	
Acknowledgements and resources	

[Home](#) / [Research](#) / [Framework for Responsible Innovation](#) / [Anticipate, reflect, engage and act \(AREA\)](#)

Anticipate, reflect, engage and act (AREA)


A Responsible Innovation approach should be one that continuously seeks to:

Anticipate – describing and analysing the impacts, intended or otherwise, (for example economic, social, environmental) that might arise. This does not seek to predict but rather to support an exploration of possible impacts and implications that may otherwise remain uncovered and little discussed.

Reflect – reflecting on the purposes of, motivations for and potential implications of the research, and the associated uncertainties, areas of ignorance, assumptions, framings, questions, dilemmas and social transformations these may bring.

Engage – opening up such visions, impacts and questioning to broader deliberation, dialogue, engagement and debate in an inclusive way.

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

Some of the skill sets required to enact the **AREA** framework will be unfamiliar to some of our community and we have outlined [some further resources](#)  that may be of use. For Responsible Innovation to take place in a meaningful way, it will be important that we and our researchers nurture and promote partnerships with other disciplines and spheres of expertise and facilitate training to enable these skills to be developed and taken forward. This might, for example, involve integrated approaches and collaborative research involving social and environmental scientists, ethicists and engagement practitioners.

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Menthol as a case study

Anticipate the environmental and societal implications of changes in the supply chain and production methods

Reflect on the values and concerns mobilised in the background of a 'synbio-turn' in menthol production

Engage with publics to understand how menthol is socially embedded in everyday practices and people's perception on a 'synbio-turn'





THE GENDER DIMENSION IN RRI

- Overlooked by most of the academic definitions and frameworks for RRI
- Part of the European Commission's agenda for RRI
- Focus on gender diversity (i.e. gender balance across research teams, committees etc.)

"Hidden" aspects of gender in RRI (epistemological and ethical):

- Gender bias (in problem framing, goal setting, product design and use in social context) brings about certain kinds of S,T&I, which are products of particular social worlds and *ways of knowing*
- Distribution of burdens and benefits of emerging technologies between men and women



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Merci de votre attention !

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Latour (2002)

"Technology is everywhere, since the term applies to a regime of enunciation, or, to put it another way, to a mode of existence, a particular form of exploring existence, a particular form of the exploration of being –"

"What is folded in technical action? Time, space and the type of actants."

"the relations of means and ends will surely never appear as simple as is supposed by the archaic split between moralists in charge of the ends and technologists controlling the means."

Wynne and Jasanoff:

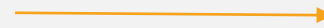
Plurality of expertise

Certified vs. non-certified knowledge

Who gets to frame problems and who's

Excluded; how problems are framed in

Technical terms, therefore excluding other publics

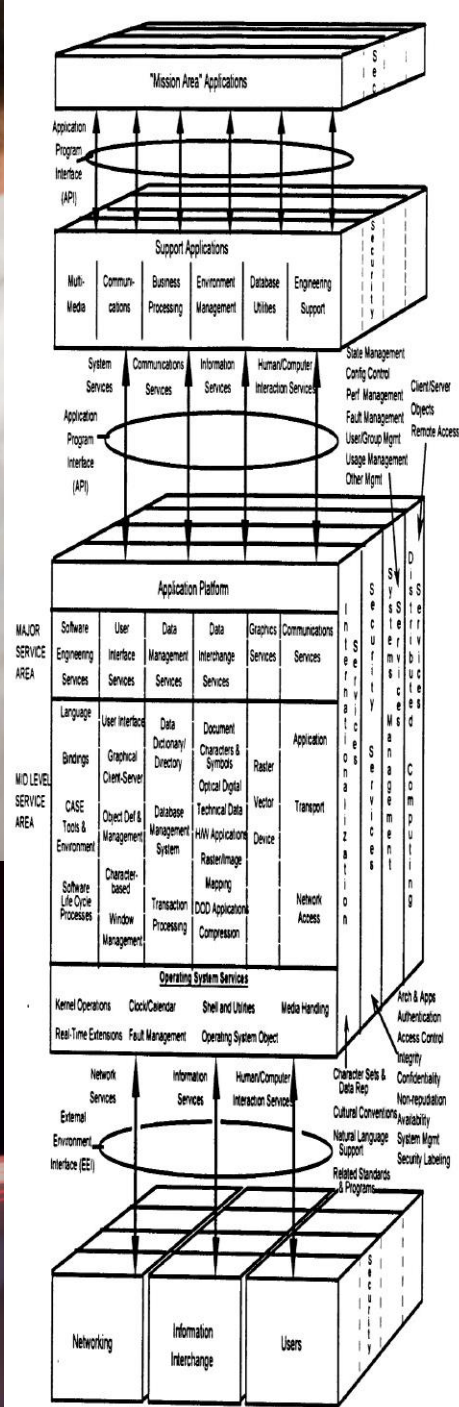
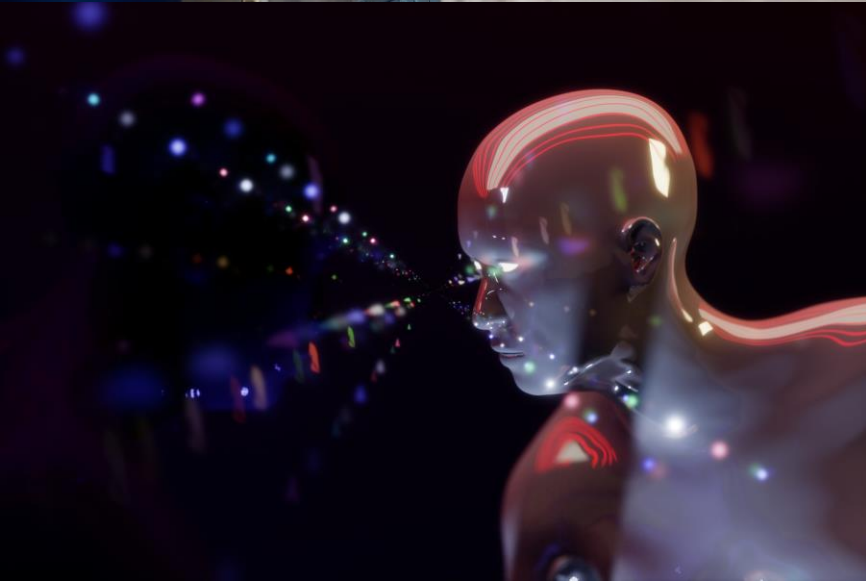


Moving upstream/midstream
And downstream

Anticipation of the potential environmental and societal **impacts** of emerging technologies

Reflection on the **ethical aspects** of emerging technologies

Consideration of technological **alternatives**, including the **narratives, interests and values** of different actors involved and/or affected by technological development



- Synthetic biology sits at the intersection of biology, engineering and computer sciences.
- These offer different / complementary / overlapping:
 - Goals
 - Types of expertise
 - Epistemic values
 - Ways of working/knowing (e.g. human-machine interaction)
- How representations of synthetic biology might be gendered (in terms of discourses and practices)?
 - Synbio 'concepts' and mediating technologies: automation; machine learning (deep learning/neural networks); self-replication
 - Divisions of labour between men and women

FEMINIST EMPIRICISM

- Holds that the problem of androcentric biases and prejudices embedded in the sciences (e.g. early neurosciences) and the social sciences (e.g. early rural sociology) are a result of poorly conducted research.
- Seeks to correct the bias problem by strictly adhering to methodological norms of conventional ('certified') scientific enquiry and including more women and feminist voices (both men and women) in the making of sciences and as research subjects.

FEMINIST STANDPOINT THEORY

- Scientific norms are only adequate to respond to questions about nature and social life that reflect androcentric matters of concern.
- Criticises Western generalisations from masculine to human (as a view of 'ideal reason').
- Investigates 'abstract masculinity' (which devaluates contextual modes of thought and emotional components of reason in understandings of nature and social relations). **PAGE 17 FOX KELLER EPISTEMOLOGY**

Evelyn Fox-Keller, Dorothy Smith, Donna Haraway