

HPSC0105

Sociology of Science & Technology

Course Syllabus

2019-20 session | Edward Thomas Bankes | edward.bankes.09@ucl.ac.uk

Course Information

This course examines the complex relationship between science and society. It also takes a sociological look at the process by which knowledge is constructed, using both historical and contemporary studies. The module also introduces students to the main currents of thought which have been influential in sociology of science.

Basic course information

Course website:	See Moodle
Moodle Web site:	See Moodle, search HPSC0105
Assessment:	3-hour exam - 50% and essay (2500 words) - 50%
Timetable:	See UCL online timetable
Prerequisites:	None. Course aimed at 2 nd and 3 rd years
Required texts:	See below
Course tutor(s):	Mr Edward Thomas Bankes
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Web:	-
Office location:	22 Gordon Square, Room B14

Schedule

The course is split between nine topics in the sociology of science and sociology. The first four topics explore the history of the field, looking to the key moments in the maturation of the sociology of science as an academic discipline in its own right and as a way of understanding science in the world. The subsequent topics are more thematic, looking at issues that have been (and continue to be) of interest to scholars in the field. Following an introductory seminar in the first session, the lecture for each topic will take place in the second half of the session. The seminar will take place the following week in the first half of the next session.

UCL Week	Topic	Activity
6	Introductory Seminar What does it mean to study science sociologically?	Core readings can be found in this syllabus. See Moodle for further activities
7	1: Starting points: From Functionalist Sociology of Science to the Strong Programme and Sociology of Knowledge	
8	2: Laboratory studies and ethnographic approaches to science	
9	3. Actor Network Theory	
10	4. Ontology, Epistemology, and Axiology	
11	5. Boundaries and classification	
11	READING WEEK – NO CLASS	
12	<i>Topic 5 (see above, continued from Week 10)</i> 6. Whose science?	
13	7. Experts and the politics of science	
14	8. Imagination, expectations and the geographies of science	
15	9. Ignorance and absences	
16	Open session Up to you: you can have a recap lecture, revisit a topic, or choose a topic we haven't covered (TBD in class)	

Assessments

Summary

	Description	Deadline	Word limit	Deadline for Tutors to provide Feedback
Assignment 1	Essay	18/12/19	2500	Four weeks after the deadline to take Christmas break into account
Exam	3 hours	Term 3		See UCL and UCL STS Exam regulations

Assignments

See end of this syllabus for assignment instructions.

Essays must be submitted via Moodle

In order to be deemed 'complete' on this module students must attempt all parts of the assignment and exam.

Specific Criteria for Assessment for this Module:

The departmental marking guidelines for individual items of assessment can be found in the STS Student Handbook.

Aims & objectives

The aim of this course is to undertake a detailed examination of the sociological contribution to the analysis of science. It examines the complex relationship between science and society and also takes a sociological look at the process by which knowledge is constructed. The course introduces students to the main currents of thought which have been influential in sociology of science through both historical and contemporary studies.

By the end of this course you should:

- Have an understanding of how science works as a social process i.e. how technical knowledge is produced by communities
- Have a detailed knowledge of the main theories in the sociology of science
- Be aware of the strengths and weaknesses of a range of sociological approaches to the analysis of science
- Begin to see links between sociological analyses of science and broader debates in science policy, history of science and philosophy of science

Although this course will draw on more general arguments and ideas in sociology, you will not be expected to become an expert in all of these wider debates. I have provided some reading for any one who wishes to place each topic in a broader sociological context.

Course expectations

Each week the class will be divided into a seminar and a lecture. The seminar will concern the previous week's lecture, giving you a week to go through your lecture notes, engage with the set readings and bring any questions you might have on the topic to the seminar. For each seminar, there will be two set readings. One will be a core reading from the sociology of science and technology directly related to the lecture, with the other will either build on this reading, or introduce the case study that will be discussed in the seminar.

You are expected to come to each seminar having read both set texts and being ready to discuss them. If you have difficulties accessing or understanding the readings, please come to see me before the seminar, either in the office hour or by emailing me to arrange a meeting. Similarly, if you have concerns about the seminar, which might include concerns about speaking in group contexts, or concerns regarding the specific language used in seminars, please come to talk to me, and I will support you the best I can.

You must attempt both the essay assignment and sit the exam in order to complete this course.

Reading list

1. GENERAL INTRODUCTIONS / TEXT BOOKS

There is no set textbook for this course. However, there are several recent introductory textbooks on the sociology of science that provide an overview of the fields within STS as a whole, and you are strongly recommended to acquire **one**. There are multiple copies of each in the UCL Science Library. If you have problems getting hold on these books, please let me know.

- Yearley, Steve (2005), *Making Sense of Science: Understanding the Social Study of Science* (London: Sage) [A good overview, with a leaning towards more contemporary issues] Abbreviated to **SY** on this reading list;
- Sismondo, Sergio (2010), *An Introduction to Science and Technology Studies* (Oxford: Blackwell) 2nd Edition [Another good introduction, with a greater leaning towards philosophy of science than the other texts]. Abbreviated to **SS** on this reading list.
- Bucchi, Massimiano (2002), *Science in Society: An Introduction to Social Studies of Science* (London: Routledge) [Well written, a little too concise in places but particularly good if you are interested in public understanding/ communication of science] Abbreviated to **MB** on this reading list;
- David, Matthew (2005), *Science in Society* (Basingstoke: Palgrave) . Tends to be aimed more at sociology students, but still a good introduction particularly if you're interested in wider links with social theory Abbreviated to **MD** on this reading list.

You should also be aware of the *Handbook of Science and Technology Studies* which has overviews of particular topics in STS:

Felt, U et al (eds) (2016), *The Handbook of Science and Technology Studies* (Fourth Edition) (2016) (Cambridge Mass: MIT Press)

Hackett, EJ (et al) (2007), *The Handbook of science and technology studies* (Cambridge, Mass.; London : MIT Press) (3rd ed)*

*The 1995 2nd edition still has good, relevant overviews of topics

2. TOPIC OVERVIEWS AND CORE READINGS

An overview of each topic, as well as the core readings for each seminar, can be found here. For further readings on each topic, see section 3.

Topic 1: From Functionalist Sociology of Science to Strong Programme and the Sociology of Knowledge

Core readings

Bloor, D (1991 [1976]), *Knowledge and Social Imagery* (Routledge) esp. Chapter 1 'The Strong Programme in the Sociology of Knowledge' (for the classic statement of the tenets of the strong programme and the argument against a 'sociology of error') and also see Afterword in 2nd Edition for response to critics. [Electronic version on course e-reading list on Moodle]

Mulkay, M.J. (1976). Norms and ideology in science. *Social science information*, 15(4-5), pp.637-656.

Does it make sense to talk about social scientific knowledge as different from natural scientific knowledge? What should social scientific knowledge about natural science be like? The publication of T.S. Kuhn's *Structure of Scientific Revolutions* in the 1960s opened the door to a sociology of scientific *knowledge*. Although Kuhn himself eschewed this approach, his theory implied that scientific change of a revolutionary order (the paradigm shift) is rooted in the characteristics of the scientific community. Sociologists began to look at knowledge itself as socially conditioned. The lecture contains a re-cap of some material on Mertonian approaches to sociology of science covered in HPSC1004. Although you will not be assessed on this material, it is worth revising before the lecture if you want a reminder of/introduction to early studies in the philosophy of science that would influence early sociology.

Good Reading for Revising Merton and Functionalist Sociology of Science:

Either

SY – Chapter 1 **OR MB** – Chapters 1-2 **OR SS** – Chapter 3 (and 4) **OR MD** – Chapter 1

Text Book Overviews of the Strong Programme

SY – Chapters 2-3 **OR MB** – Chapters 2-3 **OR SS** – Chapter 5 **OR MD** – Chapter 4

Topic 2: Laboratory Studies and The Micro-social Approach

Core Readings:

Read **one** of the overviews of laboratory studies found in the text books: Either **SY** – Chapter 6 **OR MB** – Chapter 4 **OR SS** – Chapters 6, 9 **OR MD** – Chapter 5

Harry Collins and Trevor Pinch (1998) [1993] "A New Window on the Universe: The Non-Detection of Gravitational Radiation", in *The Golem: What You Should Know About Science*, Cambridge: Cambridge University Press: 91-108. [Electronic reading list for course on Moodle]

The 'strong programme' argued that broad social and political conditions could influence the content of scientific knowledge and that the sociology of science might aspire to uncover the 'laws' of scientific practice. Towards the end of the 1970s sociology of science took a distinctly micro-social (and linguistic) turn. Detailed studies of scientists, in laboratories or making claims in papers, became the preferred methodology of 'lab anthropologists'. The complex negotiations, contingencies and skills involved in creating 'a fact' (and the way that these were all erased from the final product) became the focus of attention.

Topic 3: Actor-network theory (ANT)

Core readings

Latour, B (1983), 'Give Me a Laboratory and I will Raise the World', in *Science Observed: Perspectives on the Social Study of Science* (London: Sage) pp141-170. or extract in Biaggio, M (1999), *The Science Studies Reader* (Ch.18)). [Available in online reading list, Moodle]

AND

Amsterdamska, O (1990), 'Surely you are joking, Monsieur Latour!', *Science, Technology and Human Values* Vol.15, Fall, pp495-504.

One of the most influential schools of thought since the 1980s and 1990s has been 'actor-network theory' (ANT). The central idea is that 'facts' are created when 'heterogeneous' assemblages of actors and objects are mobilized into a 'network'. Science and society are *both* co-created as the laboratory is used as a focal point for assembling knowledge and redefining social interests. Science becomes 'politics by other means'.

Text Book Overviews

Either **SY** – Chapter 4 *OR* **SS** – Chapter 7

Or Michael, M (2016) *Actor-Network Theory: Trials, Trails and Translations* (London: Sage) Ch.3

Topic 4: Ontology, Epistemology, and Axiology

Core readings

'Bruno Latour, the Post-Truth Philosopher, Mounts a Defense of Science'.

New York Times article, available here:

<https://www.nytimes.com/2018/10/25/magazine/bruno-latour-post-truth-philosopher-science.html> (You may need to set up a free account to get access)

Latour, B. 1986. Review: Would the Last Person to Leave the Social Studies of Science Please

Turn Off the Tape Recorder?. *Social Studies of Science* [online], 16(3), pp.541-548. Available from: doi:[10.1177/030631286016003008](https://doi.org/10.1177/030631286016003008) -

As accounts of scientific practice and the production of scientific knowledge, what do the Strong Programme, Lab Studies and Actor-Network Theory presume about the nature of knowledge, the nature of science and indeed the nature of reality? This week considers the three traditions in the sociology of science together, by examining the claims they make about the nature of reality (ontology), the nature of knowledge (epistemology) and the purpose of academic work negotiating these very tricky concepts (axiology). What do these theories presume about the composition of the natural world, and the knowledge that can be produced about it? Given that these conversations are often implicit in academic work, we will consider how the different assumptions made by theories might change how we use and evaluate them.

Topic 5: Boundaries and classification

Core readings:

Hacking, I. (1986), 'Making Up People'. In T. Heller et al. (eds), *Reconstructing Individualism*. Stanford: Stanford University Press.

And Either

Gieryn TF (1983), "Boundary Work and the Demarcation of Science from Non-Science: Strains and Interests in the Professional Ideologies of Scientists", *American Sociological Review* Vol.48 pp781-795

Or:

Gieryn T (1995), 'Boundaries of Science' in Jasanoff S *et al* (eds) *Handbook of Science and Technology Studies*, (London: Sage) pp393-443 (Long but useful overview of the practical problem of demarcating the inside from the outside of science)

Drawing boundaries is an eminently social process. Boundaries are routinely drawn between, for instance, science and non-science, experts and lay persons, science and politics and the social and natural. The way in which boundaries are drawn and the purposes served by the resulting distinctions are an important topic within social studies of science. Where boundary work might be seen as an activity of drawing distinctions between different categories, how does these categories come into being, and become meaningful? This session also considers the issue of classification, as an historical (and ongoing) lens onto the practices of science as a means for creating different classes and types – particularly of people – and making them seem natural.

Topic 6: Whose science?

Core Readings

SY – Chapter 5 OR SS – Chapter 13 OR MD – Chapter 5

And at least **one** reading from the list for the topic below

So far, while we have been interrogating what it means to talk about science, and the production of knowledge within science, far less has been said about what we mean by 'science'. Often assumed to be singular, uncritical discussion of science might risk masking its specific gendered, imperial, racialized and geographic locality. Do accounts of science within the sociology of science only account for Western science, for example? Does it matter if our accounts of science are predominantly accounts of the same type of people? Does scientific (and sociological) practice mask discussion of whose science we are talking about, and who this science is for? This week provides an overview of critiques of science that have sought to challenge these versions of science and point to the multiple ways we might understand science in relation forms of social stratification and engines of inequity, such as gender, 'race' and ethnicity, disability and colonialism.

Topic 7: Experts and the Politics of Science

Core reading:

Jasanoff, S (ed) (2004), *States of knowledge: the co-production of science and social order* (London : Routledge, 2004) (Esp. Chapter: 'Ordering Knowledge, Ordering Society')

Read one of *either* **SY** – Chapter 8 *OR* **SY** – Chapter 9 *OR* **MD** – Chapter 3

Scientific expertise is called on by many groups such as industry, governments, non-governmental organisations. This science is brought to bear in regulatory disputes or other areas of controversy. What is the role of science in such situations? In the seminar, we turn to a specific social theory that has proven enormously influential within STS and the sociology of science: co-production, which seeks to untangle how science, scientific expertise and social order continually construct and reinforce one another.

Topic 8. Time and Space: Expectations, Imaginaries and the Geography of Science

Core Readings

Read two of the following key readings. If you read all three, you're onto a winner.

Borup, M *et al* (2006), 'The sociology of expectations in science and technology'. *Technology Analysis & Strategic Management* 18:285-298

Jasanoff, Sand Kim, S (2009), Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea, *Minerva* Vol. 47, No. 2, pp. 119-146

Steven Shapin (1998) 'Placing the View from Nowhere: Historical and Sociological Problems in the Location of Science', *Transactions of the Institute of British Geographers* 23 (1), 5–12.

This is a session on hope and promise. Recent STS studies of emerging technologies have emphasized the role of 'expectations' and 'imaginaries' in shaping the development of novel

science and technology. This new 'sociology of expectations' moves away from ideas of promise as 'mere' hype and looking at how promises about future utopias and dystopias actively shape the innovation process. At the same time, there has been increasing attention paid by human and cultural geographers to ideas from STS, giving rise to a burgeoning geography of science.

Topic 9: Non-Knowledge: Secrecy, Ignorance and Uncertainty

Core reading:

Galison, P. 2004. Removing knowledge. *Critical Inquiry*, 31(1), 229-43.

Balmer, B (2012), *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare* (Farnham: Ashgate) (Chapter 1 for a review of literature on science and secrecy).

STS has recently turned from looking at the construction on knowledge to also look at these various forms of non-knowledge. If there can be a sociology of scientific knowledge, can there equally be a sociology of ignorance? With respect to secrecy, a combination of STS with the geography of knowledge has promised to re-think the dynamics of secrecy.

3. FURTHER READING

NB – In each case, these are starting points and are not intended to provide an exhaustive reading list on any particular topic. Try to read as widely as you can, but also feel free to follow your own direction. Follow up on the bibliographies of articles you find interesting, and be aware that each topic can only scratch the surface of the issues in relation to the sociology of science, sociology, science education etc.

NB(2) – The reading list for the module has been built up over the years, with each person teaching the course adding and deleting readings for the course. Different course leaders use different referencing systems, so if you're looking for a model of a single referencing system for your essay, this is not the place...

1. THE STRONG PROGRAMME

Berger, P and Luckman, T (1976), *The social construction of reality : a treatise in the sociology of knowledge* (New York: Doubleday) (or <http://perflensburg.se/Berger%20social-construction-of-reality.pdf>) Intro and chapter 1 – sets out an agenda for the sociology of knowledge (not science *per se*)

Philosophers (and scientists) go apoplectic about the Strong Programme:

- Chalmers, A (1990), *Science and its Fabrication* (chapters 6-8) (a critical overview of the strong programme)
- Laudan, L (1981), 'The Pseudo-Science of Science', *Philosophy of the Social Sciences.*, Vol.11 (2) pp.173-98. (Scathing critique of the strong programme)
- Bloor, D (1981), 'The Strengths of the Strong Programme', *Philosophy of the Social Sciences*, Vol.11(2) pp.199-213.
- (Scathing defence of the strong programme) [Response to Laudan's article above]
- Kuntz, M. 2012. The Postmodern assault on science. *EMBO reports*, 13(10), pp.885-889. Available from: doi: [10.1038/embor.2012.130](https://doi.org/10.1038/embor.2012.130) – if you want proof the constructivism debate never ends

Sociologists ignore them and do Case Studies:

- Gillespie B *et al* (1979), 'Carcinogenic Risk Assessment in the United States and Great Britain: The Case of Aldrin/Dieldrin', *Social Studies of Science*, 1979, Vol.9(3), pp.265-301
- Webster, A (1991), *Science, Technology and Society* (Chapter 2) (Overview)
- Collins, H and Pinch, T (1993), 'The Germs of Dissent: Louis Pasteur and the Origins of Life', in *The Golem: What Everyone Should Know About Science* (Chapter 4) [e-copy in library]

2. LABORATORY STUDIES AND THE MICRO-SOCIAL APPROACH

- Atkinson, P. 1988. Ethnomethodology: A Critical Review. *Annual Review of Sociology* [online], 14, pp.441-465. Available from: doi:10.1146/annurev.so.14.080188.002301.
- Beaulieu, Anne . 2010. "From Co-location to Co-presence: Shifts in the Use of Ethnography for the Study of Knowledge." *Social Studies of Science* 40 (3): 453–70.
- Collins, H (1985), 'Detecting Gravitational Radiation: The Experimenters' Regress', Chapter 4 in *Changing Order: Replication and Induction in Scientific Practice* (Chicago: Univ Chicago Press) Electronic reading list for course on Moodle]
- Doing, P (2008), 'Give me a Laboratory and I will Raise a Discipline: The Past, Present and Future Politics of Laboratory Studies in STS', in Hackett, EJ (et al) (2008), *The Handbook of Science and Technology studies* (Cambridge, Mass. ; London : MIT Press) (3rd ed)

Examples of Ethnographies of Science (try to read at least one):

- Gilbert, GN. and M. Mulkey. 1984. *Opening Pandora's box: a sociological analysis of scientists' discourse*. Cambridge: Cambridge University Press.
- Karin Knorr-Cetina (1999) "From; Machines to Organisms: Detectors as Behavioural and Social Beings", in *Epistemic Cultures: How the Sciences Make Knowledge*, Cambridge, Mass.; London: Harvard University: 111-135. [Chapter available through course e-reading list on Moodle]
- Knorr Cetina, K. 1999. *Epistemic cultures: how the sciences make knowledge*. Cambridge MA; London: Harvard University Press. – **if you want a much deeper read on Knorr Cetina's work**
- Knorr-Cetina, K (1995), 'Laboratory Studies: The Cultural Approach to the Study of Science' in Jasanoff S *et al* (eds) *Handbook of Science and Technology Studies*, (London: Sage) (2nd ed) pp140-166 - **Not an easy read, but very succinct overview of the approach**
- Latour, B and Woolgar, S (1986) [1976] "An Anthropologist visits the Laboratory", in *Laboratory Life: The Construction of Scientific Facts*, N.J; Chichester: Princeton University Press: 43-88. [e-book available from UCL library; chapter also on e-reading list on Moodle site]
- Latour, B. 1986. Review: Would the Last Person to Leave the Social Studies of Science Please Turn Off the Tape Recorder?. *Social Studies of Science* [online], 16(3), pp.541-548. Available from: doi:[10.1177/030631286016003008](https://doi.org/10.1177/030631286016003008) - **A book review that sets out how Latour positions his work against ethnomethodology**
- McCreddie, M. and S. Wiggins. 2009. Reconciling the good patient persona with problematic and non-problematic humour: A grounded theory. *International Journal of Nursing* [online], 46, pp.1079-1091. Available from: doi:[10.1016/j.ijnurstu.2009.01.008](https://doi.org/10.1016/j.ijnurstu.2009.01.008)
- Mol, A (2002), 'Cutting Surgeons, Walking Patients: Some Complexities Involved in

Comparing', in Law, J and Mol, A (eds) *Complexities: Social Studies of Knowledge Practices* (Durham: Duke University Press) [e-book available from UCL library]

3. ACTOR-NETWORK THEORY

- Callon M and Latour B (1992), “Don’t Throw the Baby Out with the Bath School! A Reply to Collins and Yearley” in *Science as Practice and Culture* (Ed. Pickering A. Chicago and London: University of Chicago Press) pp343-368.
- Callon, M (1986), ‘Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay’, in Biaglio, M (1999), *The Science Studies Reader* (London Routledge) (Ch.5) - **Some key ANT jargon explained through a case study of molluscs in Brittany (Case study also discussed in SY text book)**
- Collins, HM and Yearley, S (1992), ‘Epistemological Chicken’ in A. Pickering (ed) *Science as Practice and Culture* (Chicago: University of Chicago Press) pp301-26 - **attacks the notion that non-humans can be treated as if they were the same as intentional actors**
- Latour, B (1987), *Science in Action* (Harvard University Press) (especially introduction and chapters 1 & 2) (A classic overview of Latour’s theories) (Chapter 2 ‘Laboratories’ is on Moodle e-reading list)
- Latour, B (1999), *Pandora’s Hope: Essays on the Reality of Science Studies* (Chapter 2 ‘Circulating Reference’) (Includes a good, relatively clear, illustrative case study of Amazonian soil science in the making – best to ignore the confusing diagrams) [Electronic reading list for course on Moodle]. **If you’re interested in ANT, you should definitely read this.**
- Law, J and Hassard, J (1999), *Actor-Network Theory and After* (Oxford: Blackwell) **More advanced reading – including Latour claiming that all the terms in actor-network theory, including the hyphen, are problematic.**
- Michael, M (2016) *Actor-Network Theory: Trials, Trails and Translations* (London: Sage) Ch.3 and 4 (and 7 if you are interested in brining ANT up to date)
- Scott, P (1991), ‘Levers and Counterweights: A Laboratory that Failed to Raise the World’, *Social Studies of Science* Vol.21 pp7-37 - **empirically based critique of Latour**

4. ONTOLOGY, EPISTEMOLOGY AND AXIOLOGY

This topic explores the previous topics (Strong Programme, Lab Studies and Ethnography, Actor Network Theory) in relation to questions of ontology, epistemology, and axiology. Consequently, rather than there being specific readings for this week, revisit the reading lists above. If you want to know more about ontology, epistemology and axiology, the literature on method and methodology is a good start. Methods and methodology aren't strictly speaking part of the course, but can help anchor your thinking. Most of these texts refer to the social sciences more generally, but provide a lot to help you think about how broader issues in the social sciences relate to STS. Pay less attention to the nuts and bolts of the methods, and focus more on the sections on methodology and ontology

If you want an overview of constructivist methodologies in sociology and social psychology, these three are a good start, but note that they don't have much to say about the use of discourse, constructivism etc within intersectional approaches to research.

- Edwards, D. 1997. *Discourse and Cognition*. London: Sage.
- Pollner, M. 1987. *Mundane reason: reality in everyday and sociological discourse*. Cambridge: Cambridge University Press.
- Potter, J. 1996. *Representing reality: discourse, rhetoric and social construction*. London: Sage.

Qualitative methods and methodologies

- Agrosino, M. 2007. *Doing Ethnographic and Observational Research*. London: SAGE Publications. Available from: doi: 10.4135/9781849208932.
- Archer, M., Bhaskar, R., Collier, A., Lawson, T., & Norrie, A. (eds.) 1998. *Critical realism: essential readings*. London: Routledge.
- Bauer, MW., G. Gaskell, G and NA. Allum. 2000. Quality, Quantity and Knowledge Interests: Avoiding Confusions. In: MW Bauer and G. Gaskell, eds. *Qualitative Researching with Text, Image and Sound: a practical handbook*. London; Thousand Oaks: Sage Publications, pp.3-17.
- Bauer, MW., N. Allum, and S. Miller. 2007. What can we learn from 25 years of PUS survey research? Liberating and expanding the agenda. *Public Understanding of Science*, 16, pp.79-95. Available from: doi: 10.1177/0963662506071287.
- Bhaskar, R. 1989. *Reclaiming reality: a critical introduction to contemporary philosophy*. London: Verso.
- Bryman, A. 2012. *Social research methods*, 4th edn. Oxford: Oxford University Press.
- Burman, E. and I. Parker. 1993. Introduction – discourse analysis: the turn to the text. In: E. Burman and I. Parker. eds. *Discourse analytic research: repertoires an readings of texts in action*. London; New York: Routledge, pp.1-13.
- Flick, U. 2014. *An introduction to qualitative research*. 5th ed. London: Sage Publications.

- Gill, R. 1993 Justifying injustice: broadcasters' accounts of inequality in radio. In: E. Burman and I. Parker. eds. *Discourse analytic research: repertoires an readings of texts in action*. London; New York: Routledge, pp.75-93.
- Gill, R. 2000. Discourse Analysis. In: MW Bauer and G. Gaskell, eds. *Qualitative Researching with Text, Image and Sound: a practical handbook*. London; Thousand Oaks: Sage Publications, pp.172-190.
- Gomm, R. 2008. *Social Research Methodology: A Critical Introduction*. 2nd ed. Basingstoke: Palgrave MacMillan.
- Grad, H. and LM. Rojo. 2008. Identities in Discourse: An integrative view. In: R. Dolon and J. Todoli. eds. *Analysing Identities in Discourse*. Amsterdam; Philadelphia: John Benjamins Publishing Company, pp.3-28.
- Johnstone, B. 2008. *Discourse Analysis*. 2nd ed. Oxford: Blackwell Publishing.
- Kennedy, B. 2018. Deduction, induction, and abduction. In U Flick (ed.), *The sage handbook of qualitative data collection*. London: SAGE Publication, pp.49-64. Available from: doi: 10.4135/9781526416070.
- Krippendorff, K. 2013. *Content analysis: an introduction to its methodology*. 3rd ed. Thousand Oaks: Sage Publishing.
- Lindhof, T.R. 1995. *Qualitative communication research methods*. Thousand Oaks, CA; London: Sage Publications.
- Miller, A. 2002. Realism. In: EN Zalta (ed.), *The Stanford Encyclopedia of Philosophy*. Available from: URL <https://plato.stanford.edu/archives/win2016/entries/realism/>.
- Parker, I., and E. Burman. 1993. Against discursive imperialism: empiricism and constructionism: thirty-two problems with discourse analysis. In: E. Burman and I. Parker. eds. *Discourse analytic research: repertoires an readings of texts in action*. London; New York: Routledge, pp.155-172.
- Yin, R. K. 2015. *Qualitative research from start to finish*. New York; London: The Guildford Press.

5. BOUNDARIES AND CLASSIFICATION

- Foucault, M (1966). *The order of things: an archaeology of the human sciences*.
- Gieryn, T (1999), *Cultural Boundaries of Science: Credibility on the Line* (Chicago) (Esp. Introduction)
- Golinski, J (1998), *Making Natural Knowledge: Constructivism and the History of Science* (Chapter 2 - on historical uses of the boundary problem).
- Jasanoff, S (1987), 'Contested Boundaries in Policy-Relevant Science', *Social Studies of Science* Vol.17 pp195-230 - **Complex but excellent argument on the shifting and negotiable boundary between science and politics**
- Knorr Cetina, K. 1999. *Epistemic cultures: how the sciences make knowledge*. Cambridge

MA; London: Harvard University Press.

- Lynch, M (2004), 'Circumscribing Expertise: Membership Categories in Courtroom Testimony' in Jasanoff, S (ed) *States of Knowledge* (London: Routledge) – **contains some criticisms of 'boundary-work'**
- Pereira, Maria do Mar (2018). Boundary-work that Does Not Work: Social Inequalities and the Non-performativity of Scientific Boundary-work, *Science, Technology & Human Values*, 44(2), 338-365. – **Brilliant contemporary critique of boundary work, and ties to many of the issues in topics 5 and 6**
- Yearley S (1988), *Science, Technology and Social Change* (London: Unwin Hyman). Chapter 2.

Recent Case Studies that Use Boundary-Work

- Addison, C (2017), Spliced: Boundary-work and the establishment of human gene therapy, *BioSocieties* June 2017, Volume 12, Issue 2, pp 257–281
- Elsdon-Baker, F. 2015. Creating creationists: The influence of 'issue-framing' on our understandings of public perceptions of clash narratives between evolutionary science and belief. *Public Understanding of Science* [online], 24(4), pp.422-439. Available from: doi: [10.1177/0963662514563015](https://doi.org/10.1177/0963662514563015)
- Hanks, M. 2016. Redefining Rationality: Paranormal Investigators' Humour in England. *Ethnos* [online], 81(2), pp.262-289. Available from: doi:10.1080/00141844.2014.956775 [Accessed 21 January 2017].
- Lindberg, K *et al* (2017), Performing boundary work: The emergence of a new practice in a hybrid operating room, *Social Science & Medicine*, Volume 182: 81-88
- Smith-Doerr, L., and I, Vardi. 2015. Mind the Gap: Formal Ethics Policies and Chemical Scientists' Everyday Practices in Academia and Industry. *Science, Technology, & Human Values* [online], 40(2), pp.176-198. Available from: doi:[10.1177/0162243914557950](https://doi.org/10.1177/0162243914557950).

If you're interested in considering science as a form of culture (or multiple cultures), good starting points might well be:

- Bloor, D., 1992. Left and Right Wittgensteins. In: A. Pickering (ed.), *Science as practice and culture*, Chicago; London: University of Chicago Press, pp.266-282.
- Fujimura, JH., 1992. Crafting Science: Standardized Packages, Boundary Objects, and "Translation". In: A. Picking (ed.), *Science as practice and culture*, Chicago; London: University of Chicago Press, pp.168-211.
- Holland, D., Lachicotte Jr, W., Skinner, D., Cain, C. 1998, *Identity and agency in cultural worlds*, Cambridge, MA; London: Harvard University Press – **brilliant book emerging from anthropology about the relationship between the stories we tell about ourselves and how these stories structure the world; not explicitly about science but speaks to a lot of the topics in the course**
- Pickering, A., 1992. From Science as Knowledge to Science as Practice. In: A. Picking (ed.), *Science as practice and culture*, Chicago; London: University of Chicago Press, pp.1-26.
- Shapin, S. 2010. *Never pure: historical studies of science as if it was produced by people with bodies, situated in time, space culture, and society, and struggling for credibility and authority*. Baltimore: The Johns Hopkins University Press.
- Wenger, E. 1998. *Communities of practice: learning, meaning and identity*. Cambridge University Press. – **not strictly about science, but provides a useful way of imagining scientific practice in terms of belonging within particular communities.**

6. WHOSE SCIENCE?

Starting Points from STS literature

- Felt, U et al (eds) (2016), *The Handbook of Science and Technology Studies* (Fourth Edition) (2016) (Cambridge Mass: MIT Press): Chapters 12, 13, 14, 24 depending on your interests.
- Haraway, D (1999), 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective', in Biagioli, M (ed) *The Science Studies Reader* (Routledge) and also in Lederman, M and Bartsch, I (2001), *The Gender and Science Reader* (London: Routledge). [Electronic copy available on course e-reading list on Moodle]
- Haraway, D. (1997), 'Modest_Witness@Second_Millennium', in *Modest_Witness@Second_Millennium.FemaleMan[®]_Meets_OncoMouse[™]* (London: Routledge), Chapter 1
- Harding, S. (2008), *Sciences From Below: Feminisms, Postcolonialisms and Modernities*. (Ch. 5)
- Lederman, M and Bartsch, I (2001), *The Gender and Science Reader* (London: Routledge) (Esp. sections 4 and 5)
- Oudshoorn, N (2004), "Astronauts in the Sperm World": The Renegotiation of Masculine Identities in Discourses on Male Contraceptives , *Men and Masculinities*, Vol. 6, No. 4, 349-367
- R. Velho, C. Holloway, A. Symonds, B. Balmer, 'The Effect of Transport Accessibility on the Social Inclusion of Wheelchair Users: A Mixed Methods Approach', *Social Inclusion* Vol. 4 No. 3 (2016) On-line Open Access.
- Schiebinger, L (1999), *Has Feminism Changed Science?* (Harvard Univ. Press) (esp. Sections II and III)
- Star, SL (1991), "Power, Technology and the Phenomenology of Conventions: On Being Allergic to Onions" in Law, J (ed) *A Sociology of Monsters: Essays on Power, Technology and Domination* (London and New York: Routledge) pp26-56. - **An essay on power, marginality and actor-network theory**
- Westhaver, R. (2010). "A Kind of Sorting Out": Crystal Methamphetamine, Gay Men, and Health Promotion. *Science, Technology, & Human Values* 36(2), pp.160-189.

Additional literature

- Ahmed, Sara . 2007. "A Phenomenology of Whiteness." *Feminist Theory* 8 (2): 149–68.
- Ahmed, Sara . 2012. *On Being Included: Racism and Diversity in Institutional Life*. Durham, NC: Duke University Press.
- Cech, Erin A., Anneke, Metz, Smith, Jessi L., deVries, Karen. 2017. "Epistemological Dominance and Social Inequality: Experiences of Native American Science, Engineering,

- and Health Students.” *Science, Technology, & Human Values* 42 (5): 743–74.
- Code, Lorraine . 1991. *What Can She Know? Feminist Theory and the Construction of Knowledge*. Ithaca, NY: Cornell University Press.
 - Collins, Patricia Hill . 1990. *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment*. Boston, MA: Unwin Hyman.
 - Dotson, Kristie . 2014. “Conceptualizing Epistemic Oppression.” *Social Epistemology* 28 (2): 115–38.
 - Fontes, Fernando, Sena, Martins, Bruno, Hespanha, Pedro, Hespanha. 2014. “The Emancipation of Disability Studies in Portugal.” *Disability & Society* 9 (6): 849–62.
 - Hammonds, Evelyn, Subramaniam, Banu. 2003. “A Conversation on Feminist Science Studies.” *Signs: Journal of Women in Culture and Society* 28 (3): 923–44.
 - Hess, David J., Sulfikar, Amir, Scott, Frickel, Daniel, Lee Kleinman, Kelly, Moore, Williams, Logan DA. 2016. “Structural Inequality and the Politics of Science and Technology.” In *Handbook of Science and Technology Studies*, edited by Felt, U., Fouché, R., Miller, C., S-Doerr, L.. Cambridge: MIT Press.
 - Kilomba, Grada . 2007. *Africans in the Academia: Diversity in Adversity*. Accessed April 02, 2017. <http://www.africavenir.org/nc/news-details/article/africans-in-the-academia-diversity-in-adversity.html>.
 - Lamont, Michèle . 2009. *How Professors Think: Inside the Curious World of Academic Judgment*. Cambridge, MA: Harvard University Press.
 - M’charek, Amade, Schramm, Katharina, Skinner, David. 2014. “Technologies of Belonging: The Absent Presence of Race in Europe.” *Science, Technology, & Human Values* 39 (4): 459–67.
 - Moser, Ingunn . 2006. “Sociotechnical Practices and Difference: on the Interferences between Disability, Gender, and Class.” *Science, Technology, & Human Values* 31 (5): 537–64.
 - Papadopoulos, D. 2014. *Politics of Matter: Justice and Organisation in Technoscience*. *Social Epistemology* [online], 28(1), pp.70-85. Available from: doi: 10.1080/02691728.2013.862878
 - Pereira, Maria do Mar . 2014. “The Importance of Being ‘Modern’ and Foreign: Feminist Scholarship and the Epistemic Status of Nations.” *Signs: Journal of Women in Culture and Society* 39 (3): 627–57.
 - Pereira, Maria do Mar . 2017. *Power, Knowledge and Feminist Scholarship: An Ethnography of Academia*. London, UK: Routledge.
 - Puig de la Bellacasa, M. 2014. *Encountering Bioinfrastructure: Ecological Struggles and the Sciences of Soil*. *Social Epistemology* [online], 28(1), pp.26-40. Available from: doi:10.1080/02691728.2013.862879.
 - Savransky, M., 2018. *The Humor of the Problematic: Thinking with Stengers*. *Substance* [online], 47(1), pp.29-46. Available from: url: muse.jhu.edu/article/689012 .
 - Stengers, I. 2000. *Another Look: Relearning to Laugh*. *Hypatia: a journal of feminist*

philosophy [online], 15(4), pp.41-54. Available from: doi: [10.1111/j.1527-2001.2000.tb00348.x](https://doi.org/10.1111/j.1527-2001.2000.tb00348.x).

- Stengers, I. 2005. Introductory notes on an ecology of practices. *Cultural Studies Review*, 11(1), pp.183-196.
- Stengers, I. 2011. Comparison as a matter of concern. *Common knowledge* [online], 17(1), pp.48-63. Available from: doi: [10.1215/0961754X-2010-035](https://doi.org/10.1215/0961754X-2010-035)
- Stengers, I. 2011. Sciences were never “good”. *Common Knowledge* (online), 17(1), pp.82-86. Available from: doi: [10.1215/0961754X-2010-039](https://doi.org/10.1215/0961754X-2010-039)

Work specifically on identity

- Archer, L., Dawson, E., DeWitt, J., Godec, S., King, H., Mau, A., Nomikou, E., Seakins, A. 2017. Killing curiosity? An analysis of celebrated identity performances among teachers and students in nine London secondary science classrooms. *Science Education* [online], 101, pp.741-764. Available from: doi:[10.1002/sce.21291](https://doi.org/10.1002/sce.21291) [Accessed 28 January 2017].
- Archer, L., Dawson, E., DeWitt, J., Seakins, A., Wong, B. 2015. “Science Capital”: A Conceptual, Methodological, and Empirical Argument for Extending Bourdieusian Notions of Capital Beyond the Arts. *Journal of research in science teaching* [online], 52(7), pp.922-948. Available from: doi:[10.1002/tea.21227](https://doi.org/10.1002/tea.21227) [Accessed 14 May 2018].
- Archer, L., Dewitt, J., Osborne, J., Dillon, J, Willis, B., Wong, B. 2010. “Doing” Science Versus “Being” a Scientist: Examining 10/11-Year-Old Schoolchildren’s Constructions of Science Through the Lens of Identity. *Science Education* [online], 94, pp.617-639. Available from: doi:[10.1002/sce.20399](https://doi.org/10.1002/sce.20399).
- Archer, L., J. DeWitt, and B. Willis. 2014. Adolescent boys’ science aspirations: Masculinity, capital, and power. *Journal of research in science teaching* [online], 51(1), pp.1-30. Available from: doi: [10.1002/tea.21122](https://doi.org/10.1002/tea.21122)
- Daston, L. and HO Sibum. 2003. Introduction: Scientific Personae and Their Histories. *Science in Context* [online], 16(1/2), pp.1-8. Available from: doi:[10.1017/S026988970300067X](https://doi.org/10.1017/S026988970300067X)
- Dawson, E. 2014. Reframing social exclusion from science communication: moving away from ‘barriers’ towards a more complex perspective. *JCOM* [online], 13(01), Editorial. Available from: url: <
https://jcom.sissa.it/sites/default/files/documents/JCOM_1302_2014_C02.pdf>
- Dawson, E. 2018. Reimagining publics and (non) participation: Exploring exclusion from science communication through the experiences of low-income, minority ethnic groups. *Public Understanding of Science* [online], Online First, pp.1-15. Available from: doi:[10.1177/0963662517750072](https://doi.org/10.1177/0963662517750072)
- Holden, K. 2015. Lamenting the Golden Age: Love, Labour and Loss in the Collective Memory of Scientists. *Science as Culture* [online], 24(1), pp.24-45. Available from: doi:[10.1080/09505431.2014.928678](https://doi.org/10.1080/09505431.2014.928678) [Accessed 22 April 2018].

- Holland, D., Lachicotte Jr, W., Skinner, D., Cain, C. 1998, *Identity and agency in cultural worlds*, Cambridge, MA; London: Harvard University Press.
- Holland, D., Lave, J. 2001. History in Person. In: D Holland and J Lave (eds.), *History in person: enduring struggles, contentious practice, intimate identities*. Santa Fe: SAR Press, pp.3-33. – **Quite heavy going, and draws a lot from Bourdieu and Bakhtin, but worth the effort if you want an account of identity that places the individual within much broader contexts and considers identity as a socio-historic achievement**
- Jaspal, R., B. Nerlich and K. van Vuuren. 2016. Embracing and resisting climate identities in Australian press: Sceptics, scientists and politics. *Public Understanding of Science* [online], 25(7), pp.807-824. Available from: doi: [10.1177/0963662515584287](https://doi.org/10.1177/0963662515584287).
- Jones, A. 2017. Exceptionalism and the broadcasting of science. *Journal of Science Communication*, 16(03), A05. Available from: URL: https://jcom.sissa.it/archive/16/03/JCOM_1603_2017_A05
- Molinatti, G., and L. Simonneau. 2015. A Socioenvironmental Shale Gas Controversy: Scientists' Public Communications, Social Responsibility and Collective Versus Individual Positions. *Science Communication* [online], 37(2), pp.190-216. Available from: doi: [10.1177/1075547014560827](https://doi.org/10.1177/1075547014560827).
- R. Dolon and J. Todoli. eds. *Analysing Identities in Discourse*. Amsterdam; Philadelphia: John Benjamins Publishing Company – **more methodological, but useful if identity is your big interest**
- Rees, A. 2007. Reflections on the Field: Primatology, Popular Science and the Politics of Personhood. *Social Studies of Science* [online], 37(6), pp.881-907. Available from: doi:[10.1177/0306312707077368](https://doi.org/10.1177/0306312707077368)
- Shapin, S. 2004. Who is the Industrial Scientist? Commentary from Academic Sociology and the Shop-Floor in the United States, ca. 1900-ca. 1970. In: K Grandin, N Wormbs and S Widmalm, eds, *The science-industry nexus: history, policy, implications*. Canton, MA: Science History Publications pp.337-363.
- Wynne, B. 1996. Misunderstood misunderstandings: social identities and public uptake of science. In: A. Irwin and B. Wynne, eds. *Misunderstanding science? the public reconstruction of science and technology*. Cambridge: Cambridge University Press, pp.19-46.

7. EXPERTS AND THE POLITICS OF SCIENCE

- Irwin, A (2001), *Sociology and the Environment* (Cambridge: Polity) Chapters 5 and 7.
- Irwin, A (2007), 'STS Perspectives on Scientific Governance', in Hackett, EJ (et al), *The Handbook of Science and Technology studies* (Cambridge, Mass. ; London : MIT Press) (3rd ed) [NOT the fourth edition cited in general readings]
- Jasanoff, S (1987), 'Contested Boundaries in Policy-Relevant Science', *Social Studies of Science* Vol.17 pp195-230 - **Complex but excellent argument on the shifting and negotiable boundary between science and politics**
- Lupton, D (1999), *Risk* (Routledge). Chapter 2 'Theorizing Risk' (Short and excellent introduction to risk in social science) [Electronic copy on e-reading list on Moodle]
- Ravetz, J (2006), *The No-Nonsense Guide to Science* (New Internationalist), Chapters 5 and 6 (Scientific Objectivity; Uncertainty)
- Reardon, J (2001), 'The Human Genome Diversity Project: A Case Study in Coproduction', *Social Studies of Science*, Vol.31 No.3 pp.357-388 - **On the simultaneous production of social and natural categories, together with the boundary between them.**
- Stilgoe, J (2005), 'Controlling mobile phone health risks in the UK: a fragile discourse of compliance', *Science and Public Policy* Vol. 32(1): 55-64. - **Case study involving the public face of science**
- Stirling, A (2007), 'Risk, Precaution and Science: Towards a More Constructive Debate', *EMBO Reports* 8(4):309-315
- *The First Hundred Days*, an academic blog coming from Harvard STS dealing with the politics and repercussions of so-called 'post-truth' and 'alternative facts': <http://first100days.stsprogram.org>
- Wynne, B. 1996. May the sheep safely graze?: A reflexive view of the expert-lay knowledge divide. In: S. Lash, B. Szerszynski and B. Wynne, eds. *Risk, environment and modernity: Towards a new ecology*, pp.44-83.

8. EXPECTATIONS, IMAGINATION AND GEOGRAPHIES OF SCIENCE

Additional Readings on Expectations and Imaginaries

- Adam Hedgecoe, Paul Martin (2003), 'The Drugs Don't Work : Expectations and the Shaping of Pharmacogenetics', *Social Studies of Science*, Vol. 33, No. 3, 327-364
- Brown, N and Kraft, A (2006), 'Blood Ties: Banking the Stem Cell Promise', *Technology Analysis & Strategic Management* Vol. 18 , Issue 3-4
- Brown, N and Michael, M (2003), 'A Sociology of Expectations: Retrospecting Prospects and Prospecting Retrospects', *Technology Analysis & Strategic Management* 15: 3-18
- Busby, Helen, Martin, Paul (2006) 'Biobanks, national identity and imagined communities: The case of UK biobank' *Science as Culture*, Volume 15, Number 3, September 2006 , pp. 237-251(15)
- Hurlbut, JB (2015) 'Remembering the Future: Science, Law and the Legacy of Asilomar' in Jasanoff , Sand Kim, S (eds), *Dreamscapes of Modernity: Sociotechnical Imaginaries And The Fabrication Of Power* [other chapters might also be of interest]
- Jasanoff, S. 2015. Future Imperfect: Science, Technology, and the Imaginations of Modernity. In: S. Jasanoff and S-H. Kim [eds], *Dreamscapes of Modernity: sociotechnical imaginaries and the fabrication of power*. Chicago: University of Chicago Press.
- Rommetveit, K. and B. Wynne. 2017. Technoscience, imagined publics and public imaginations. *Public Understanding of Science* [online], 26(2), pp.133-147. Available from: doi: [10.1177/0963662516663057](https://doi.org/10.1177/0963662516663057) .
- Savaget, P. and L. Acero. 2017. Plurality in understands of innovation, sociotechnical progress and sustainable development: An analysis of OECD expert narratives. *Public Understanding of Science* [online], Online First, First Published 1 March 2017. Available from: doi: [10.1177/0963662517695056](https://doi.org/10.1177/0963662517695056) .
- Shapin, S. 2008. *The scientific life: a moral history of a late modern vocation*. Chicago; London: University of Chicago Press. – **Final chapter about Silicon valley.**
- *The Sociotechnical Imaginaries Project*, useful website run from Harvard STS, particularly the FAQ and antecedents sections: <http://sts.hks.harvard.edu/research/platforms/imaginaries/>
- Welsh, I., and B, Wynne. 2013. Science, Scientism and Imaginaries of Publics in the UK: Passive Objects, Incipient Threats. *Science as Culture* [online], 22(4), pp.540-566. Available from: doi:10.1080/14636778.2013.764072.

Additional Readings on Geographies of Science

- Canales, AF (2012), 'A new space for a new science: the transformation of the JAE Campus after the Spanish Civil War', *History of Education: Journal of the History of Education Society*, 41:5, 657-674.

- Collier S J, Lakoff A, (2008), "Distributed preparedness: the spatial logic of domestic security in the United States" *Environment and Planning D: Society and Space* **26**(1) 7 – 28.
- Davies GF (2014). 'Searching for GloFish™: Aesthetics, Ethics and Encounters with the Neon Baroque'. *Environment and Planning A: international journal of urban and regional research*, 46(11), 2604-2621
- Henke, C and Gieryn, T (2007), 'Sites of Scientific Practice: The Enduring Importance of Place', in Hackett, EJ (et al) (2007), *The Handbook of science and technology studies* (Cambridge, Mass. ; London : MIT Press) (3rd ed): 353-77
- Secord, J (2004) Knowledge in Transit *Isis*, 95, 654–672

9. NON-KNOWLEDGE, IGNORANCE, SECRECY AND UNCERTAINTY

- Balmer, B. 2010. Keeping Nothing Secret: United Kingdom Chemical Warfare Policy in the 1960s. *Journal of Strategic Studies* [online], 33(6), pp.871-893. Available from: doi:10.1080/01402390.2010.498285
- Bauchspies, WK. 2014. Presence from Absence: Looking within the Triad of Science, Technology and Development. *Social Epistemology* [online], 28(1), pp.56-69. Available from: doi: 10.1080/02691728.2013.862877.
- Conway, E and Oreskes, N (2012) *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (London: Bloomsbury)
- Croissant, J. 2014. Agnotology: Ignorance and Absence or Towards a Sociology of Things That Aren't There. *Social Epistemology* [online], 28(1), pp.4-25. Available from: doi: 10.1080/02691728.2013.862880
- Frickel, S. 2014. Absences: Methodological Note about Nothing in Particular, *Social Epistemology* [online], 28(1), pp.86-95. Available from: doi:10.1080/02691728.2013.862881.
- Frickel, S. and MB. Vincent. 2007. Hurricane Katrina, contamination, and the unintended organization of ignorance. *Technology in Society* [online], 29, pp.181-188. Available from: doi:[10.1016/j.techsoc.2007.01.007](https://doi.org/10.1016/j.techsoc.2007.01.007).
- Frickel, S., S. Gibbon, J. Howard, J. Kempner, G. Ottinger and DJ. Hess. 2010. Undone Science: Charting Social Movement and Civil Society Challenges to Research Agenda Setting. *Science, Technology & Human Values* [online], 35(4), pp.444-473. Available from: doi:[10.1177/0162243909345836](https://doi.org/10.1177/0162243909345836)
- Gross, M and McGoey L (eds), *Routledge International Handbook of Ignorance Studies* (London: Routledge) Introduction pp1-12. There are a wealth of case studies in this handbook that really show the differences in how scholars have interpreted ignorance as a problem to be corrected, a problem of the public, an inevitable part of knowledge production and a phenomenon largely created by scholars. It's a fascinating read if you have time.
- Gross, M. 2010. *Ignorance and surprise: science, society, and ecological design*. Cambridge MA: The MIT Press.
- Hess, D.J. 2015. Undone science and social movements: a review and typology. In: M. Gross and L. McGoey, eds. *Routledge international handbook of ignorance studies*. London; New York: Routledge, pp.141-154.
- Hess, DJ. 2009. The Potentials and Limitations of Civil Society Research: Getting Undone Science Done. *Sociological Inquiry* [online] 79(3), pp.306-327. Available from: doi:10.1111/j.1475-682X.2009.00292.x.
- Holmberg, T and Ideland, M (2012), 'Secrets and lies: "selective openness" in the apparatus of animal experimentation', *Public Understanding of Science* vol. 21 no. 3:

354-368

- Kempener, J (2011), 'Forbidden Knowledge: Public Controversy and the Production of Nonknowledge', *Sociological Forum* 26(3): 475-500.
- Kleinman, DL. and S. Suryanarayanan. 2013. Dying Bees and the Social Production of Ignorance. *Science, Technology & Human Values* [online], 38(4), pp.492-517. Available from: doi:[10.1177/0162243912442575](https://doi.org/10.1177/0162243912442575)
- MacKenzie , D and Spinardi, G (1995), 'Tacit knowledge, weapons design, and the uninvention of nuclear weapons' *American Journal of Sociology* 101(1) (1995), pp.44-99
- Merton, R. 1973. The normative structure of science, in *The Sociology of Science: Theoretical and Empirical Investigations*, edited by N. Storer. Chicago: University of Chicago Press, 267-78.
- Michael, M. 1996. Ignoring science: discourses of ignorance in the public understanding of science. In: A. Irwin and B. Wynne, eds. *Misunderstanding science? the public reconstruction of science and technology*. Cambridge: Cambridge University Press, pp.107-125. – **More a meta-discussion of the meaning of 'ignorance' within science, but good to be aware of nonetheless**
- Paglen, T. (2010). Goatsucker: toward a spatial theory of state secrecy. *Environment and Planning D: Society and Space*, 28(5), pp.759-771.
- Pinto, M. 2015. Tensions in Agnotology: Normativity in the studies of commercially driven ignorance. *Social Studies of Science* [online], 45(2), pp.294-315. Available from: doi:[10.1177/0306312714565491](https://doi.org/10.1177/0306312714565491).
- Proctor, R.N. 2008. Agnotology: A Missing Term to Describe the Cultural Production of Ignorance (and Its Study). In: R.N. Proctor and L. Schiebinger, eds. *Agnotology: the making and unmaking of ignorance*. Stanford: Stanford University Press, pp.1-33.
- Rappert, B. 2012. States of ignorance: the unmaking and remaking of death tolls. *Economy and Society* [online], 41(1), pp.42-63. Available from: doi:[10.1080/03085147.2011.637334](https://doi.org/10.1080/03085147.2011.637334)
- Rappert, B. 2015. Sensing absence: How to See What isn't there in the Study of Science and Security. In: B. Rappert and B. Balmer, eds. *Absence in science, security and policy: from research agendas to global strategy*. Basingstoke: Palgrave Macmillan, pp.3-33.
- Robert N. Proctor, R and Londa Schiebinger, L (2008), *Agnotology: The Making and Unmaking of Ignorance* (Stanford: Stanford University Press)
- Schiebinger, L. 2008. West Indian Abortifacients and the Making of Ignorance. In: R.N. Proctor and L. Schiebinger, eds. *Agnotology: the making and unmaking of ignorance*. Stanford: Stanford University Press, pp.149-162.
- Tuana, N. 2008. Coming to Understand: Orgasm and the Epistemology of Ignorance. In: R.N. Proctor and L. Schiebinger, eds. *Agnotology: the making and unmaking of ignorance*. Stanford: Stanford University Press, pp.108-145

ASSESSMENT

Assignments should be word-processed, 12 point type, minimum 1.5 line-spaced, with page numbers added and with a word count at the end.

ASSESSMENT ONE: 2500-WORD ESSAY (TERM 1)

For your essay, you will choose and research a case study, that you will analyse using at least one of the sets of readings from the course. Alongside presenting both the case study and the academic literature you have chosen to form the basis of your essay, you will be assessed on your ability to critically analyse how work in the sociology of science and technology might be used to make sense of science in society. Consequently, your essay will need to include:

- An overview of your case study, highlighting the substantive issues raised by the case-study, and the context in which the case study emerged
- An overview of the academic approach you have chosen from the sociology of science and technology, demonstrating that you understand what this work assumes about science and society (and their relationship), and the claims that this work allows you to make about science, technology and society
- Critical analysis of the academic approach you've chosen as a means for analysing and understanding your case study. Rather than trying to make your case study fit a particular approach in the sociology of science, your job is to consider what theoretical work illuminates about your case study, and potentially what it fails to illuminate. If your case study highlights a deficiency in a particular theoretical position, how might this deficiency be overcome?
- Some consideration of the methods and methodologies implicated by your case study and your analytical frame. What does your theory presume about the world – is it realist, anti-realist, constructivist etc? Similarly, what methods can be used in applying the theory. Would they work in the context of your case study?
- As you develop your essay, you will need to ensure that you focus on both the case study and a critique/analysis of the relevant theoretical work. It won't do to either present a brilliant analysis of a case study that ignores work from the course, nor to present an entirely theoretical piece in which your case study is side-lined. Your job primarily is to find a case study that permits a critical analysis of a body of theoretical work, using the case study as a way to 'test out' the theory.

Your essay should be no more than 2500 words long with a list of references at the end. Do not include references in your word count. Any footnotes must be included in your word count, though it is unlikely you will need them (if they're a crucial part of your argument, they should be in the main body of your essay anyway). If you make use of any unpublished primary sources for your essay, or pictures, maps, object descriptions etc, you can include these in the end of your essay as an appendix, which is not part of the word count. You are expected to read widely for this assignment in order to answer the question set. As the essay will require you to present a clear case study, part of your job during the course will be to develop this case study alongside your readings for seminars, and to build up your own body

of readings. You are welcome to use the office hours to get advice about your case study. I can point you to additional readings that might be helpful, and will help you find sources that can help you flesh out your case studies.

ASSESSMENT TWO: THREE-HOUR EXAM (TERM 3)

Where the essay allows you to engage closely with one topic from the course, the essay will assess your understanding of the topics from the course as a whole. The exam will take place in Term 3. The exam will consist of **three** questions: you will answer one compulsory question, and two questions of your choice. The compulsory question will require you to take a synoptic view of the module, considering the material covered over the nine weeks as a whole. The optional questions will be more focused, allowing you to respond to more detailed examinations of the topics covered in the course, though this does not mean that each question will refer to only one topic covered in the course. The questions that you will answer in the exam will be released one week before the date of the exam, meaning that you will have one week to prepare your responses, though you will not be able to bring any materials into the exam room with you.