

# **Syllabus for Graduate Course on *STS and its Discontents***

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## Course Description:

This course is designed to provide an overview of Science and Technology Studies (STS) by focusing on some of the major themes and concerns in the field. It is an opportunity to investigate how STS scholars go about their work by critically engaging with some debates that have shaped the intellectual trajectory of the discipline. STS explores the mutually constitutive relationship between science, technology and society. Instead of evaluating scientific claims on parameters such as truth or facticity, STS researchers study how social, political, cultural, and material conditions shape technoscientific work and how technoscience, in turn, shapes society. However, there is a diversity of methods and standpoints employed to do such studies and they have shaped the intellectual trajectory of STS as an academic discipline in distinct ways. This seminar will be concerned not only with scientists, technology builders, and their work but also the challenges of delineating methods to study them by tracing some of the important debates in the development of STS as an academic discipline. Every seminar class has a set of readings that present a perspective on approaching the study of a technoscientific phenomenon and a debate around how methodologically appropriate the perspective is. Students are expected to not only grasp the perspective, but also to test them out during in-class debates.

## Learning Outcomes:

Upon completion of this course, you will be able to:

- **Understand** and **contextualize** some of the major concepts, themes, and sensibilities that have shaped the field;
- **Challenge** and **unpack** entrenched assumptions about science, technology, and knowledge;
- **Critically reflect upon** and **contribute to** old and new debates and controversies in STS;
- **Write** and **present** concise and effective analyses and reports of original research.

As an overview of the field, this course is inevitably partial – both in the sense of being incomplete and in the sense of prioritizing some topics of debate over others. My goal is to give you a good enough sense of the field to recognize these partialities and make them productive for your own work.

## Assignments:

In addition to active participation in weekly class discussion and debates, students should also prepare in advance of each seminar class a synopsis of the week's readings, identifying arguments, common themes, oppositions, and issues worthy of further consideration for the in-class debate.

A final essay will be required by the end of the semester; this paper, of at least 5000 words and on a debate of your choice, will consider and attempt to synthesize some of the issues and concerns encountered in the course. This essay should first symmetrically approach both positions in a debate. Ultimately, it should either offer insights into how a middle-ground between the positions becomes a generative space for future research within STS or present coherent arguments in support of a position to situate what the future might look like if the position turns paradigmatic within STS.

## Class Schedule:

### *Week 1: Organizational Meeting*

An introduction to the class. We'll review course mechanics and get a sense of the themes and concerns of the course. In class, we will take a contemporary example of a technoscientific controversy and debate on how to methodologically approach and unpack it. I will also give you a set of propositions with respect to the controversy and you are expected to either defend or refute them in teams of two.

*Further readings:*

- Sismondo, Sergio. 2004. *An Introduction to Science and Technology Studies*. Oxford: Blackwell Publishing.

- Dumit, Joseph. 2012. “How I Read.” *Joseph Dumit: STS / Anthropology / UC Davis*. <http://dumit.net/how-i-read/>.

Websites: *A partial selection of professional and informational websites on STS communities across the world:*

Asia Pacific Science, Technology & Society Network, <http://apstsn.org/>  
 European Association for the Study of Science and Technology (EASST), <http://easst.net/>  
 History of Science Society, <http://hssonline.org/>  
 Section on Science, Knowledge, and Technology, American Sociological Association,  
<http://www.asanet.org/sections/SKAT.cfm>  
 Sociedad Latinoamericana de Estudios Sociales de la Ciencia y la Tecnología (ESOCITE),  
<http://www.escyt.org/>  
 Society for Medical Anthropology, <http://www.medanthro.net/>  
 Society for the History of Technology (SHOT), <http://www.historyoftechnology.org/>  
 Society for the Social Studies of Science (4S), <http://www.4sonline.org/>  
 STS Wiki, <http://stswiki.org/>

**Week 2: Kuhn’s Revolution in History & Philosophy of Science**

**Readings**

- Kuhn, Thomas S. 1970. *The Structure of Scientific Revolutions*. 2nd ed. Chicago: University of Chicago Press. [Chapter 1: Introduction: A Role for History to Chapter 9: The Nature and Necessity of Scientific Revolutions]
- Popper, Karl. 1963. “Science as Falsification.” In *Conjectures and Refutations*, 33–39. London: Routledge & Kegan Paul.
- Popper, Karl. 2002. “A Survey of Some Fundamental Problems.” In *The Logic of Scientific Discovery*, 3–26. London and New York: Routledge.

*Debate between Kuhn and Popper:*

- Kuhn, Thomas S. 1970. “Logic of Discovery or Psychology of Research?” In *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Vol. 4*, edited by Imre Lakatos and Alan Musgrave, 1–24. Cambridge: Cambridge University Press.
- Popper, Karl. 1970. “Normal Science and Its Dangers.” In *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Vol. 4*, edited by Imre Lakatos and Alan Musgrave, 51–58. Cambridge: Cambridge University Press.
- Kuhn, Thomas S. 1970. “Reflections on My Critics.” In *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Vol. 4*, edited by Imre Lakatos and Alan Musgrave, 231–78. Cambridge: Cambridge University Press.

*Further Readings:*

- Fleck, Ludwik. 1979. *Genesis and Development of a Scientific Fact*. Chicago: University of Chicago Press.
- Hanson, Norwood Russell. 1967. “An Anatomy of Discovery.” *The Journal of Philosophy* 64 (11): 321–52.
- Feyerabend, Paul. 1975. *Against Method: Outline of an Anarchistic Theory of Knowledge*. London: Verso.
- Lakatos, Imre. 1970. “Falsification and the Methodology of Scientific Research Programmes.” In *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Vol. 4*, edited by Imre Lakatos and Alan Musgrave, 91–196. Cambridge: Cambridge University Press.
- Shapin, Steven. 1992. “Discipline and Bounding: The History and Sociology of Science as Seen through the Externalism-Internalism Debate.” *History of Science* 30 (4): 333–69.

### **Week 3: The Strong Programme in Sociology of Scientific Knowledge (SSK)**

#### **Readings**

- Bloor, David. 1976. *Knowledge and Social Imagery*. London: Routledge & Kegan Paul. [Chapters 1: The Strong Programme in the Sociology of Knowledge, and 4: Knowledge and Social Imagery: A Case Study]
- Barnes, Barry, and David Bloor. 1982. "Relativism, Rationalism, and the Sociology of Knowledge." In *Rationality and Relativism*, edited by Martin Hollis and Steven Lukes, 21–47. Cambridge: MIT Press.
- Collins, Harry M. 1981. "Son of Seven Sexes: The Social Construction of a Physical Phenomenon." *Social Studies of Science* 11 (1): 33–62.

#### *Debates on SSK's relativist view of knowledge production:*

- Laudan, Larry. 1981. "The Pseudo-Science of Science?" *Philosophy of the Social Sciences* 11 (2): 173–98.
- Bloor, David. 1981. "The Strengths of the Strong Programme in the Sociology of Knowledge." *Philosophy of the Social Sciences* 11 (2): 199–213.

#### *Further Readings:*

- Barnes, Barry. 1977. *Interests and the Growth of Knowledge*. London: Routledge & Kegan Paul.
- Pickering, Andy. 1984. "Against Putting the Phenomena First: The Discovery of the Weak Neutral Current." *Studies in History and Philosophy of Science Part A* 15 (2): 85–117.
- Collins, Harry M. 1983. "An Empirical Relativist Programme in the Sociology of Scientific Knowledge." In *Science Observed: Perspectives on the Social Study of Science*, edited by Karin D Knorr-Cetina and Michael Mulkay, 83–113. Beverly Hills: Sage.
- Ashmore, Malcolm. 1996. "Ending Up On the Wrong Side: Must the Forms of Radicalism Always Be at War?" *Social Studies of Science* 26: 305–22.
- Mulkay, Michael. 1979. *Science and the Sociology of Knowledge*. London: Allen and Unwin.
- Galison, Peter L. 1995. "Context and Constraints." In *Scientific Practice: Theories and Stories of Doing Physics*, edited by Jed Z Buchwald, 13–41. Chicago: Chicago University Press.
- Pickering, Andrew. 1995. "Beyond Constraint: The Temporality of Practice and the Historicity of Knowledge." In *Scientific Practice: Theories and Stories of Doing Physics*, edited by Jed Z Buchwald, 42–55. Chicago: Chicago University Press.

### **Week 4: Wittgenstein, SSK, and Ethnomethodological Studies of Work**

#### **Readings**

- Wittgenstein, Ludwig. 1958. *Philosophical Investigations*. Edited by G E M Anscombe. 3rd ed. New York: Macmillan Publishing.
- Bloor, David. 1973. "Wittgenstein and Mannheim on the Sociology of Mathematics." *Studies in History and Philosophy of Science* 4 (2): 173–91.
- Lynch, Michael, and Mark Peyrot. 1992. "Introduction: A Reader's Guide to Ethnomethodology." *Qualitative Sociology* 15 (2): 113–22.

#### *Debate between Left and Right Wittgensteinians:*

- Lynch, Michael. 1992. "Extending Wittgenstein: The Pivotal Move from Epistemology to the Sociology of Science." In *Science as Practice and Culture*, edited by Andrew Pickering, 215–65. Chicago and London: University of Chicago Press.
- Bloor, David. 1992. "Left and Right Wittgensteinians." In *Science as Practice and Culture*, edited by Andrew Pickering, 266–82. Chicago and London: University of Chicago Press.
- Lynch, Michael. 1992. "From the 'Will to Theory' to the Discursive Collage: A Reply to Bloor's 'Left and Right Wittgensteinians.'" In *Science as Practice and Culture*, edited by Andrew Pickering, 283–300. Chicago and London: University of Chicago Press.

### Further Readings:

- Garfinkel, Harold. 1967. *Studies in Ethnomethodology*. Cambridge: Polity Press.
- Winch, Peter. 1958. *The Idea of a Social Science and Its Relation to Philosophy*. London: Routledge.
- Winch, Peter. 1964. "Understanding a Primitive Society." *American Philosophical Quarterly* 1 (4): 307–24.
- Bloor, David. 2002. *Wittgenstein: Rules and Institutions*. London: Routledge.
- Kusch, Martin. 2004. "Rule-Scepticism and the Sociology of Scientific Knowledge: The Bloor-Lynch Debate Revisited." *Social Studies of Science* 34 (4). Sage Publications, Ltd.: 571–91.
- Lynch, Michael. 1999. "Silence in Context: Ethnomethodology and Social Theory." *Human Studies* 22 (2): 211–33.
- Sharrock, Wes, and Graham Button. 1999. "Do the Right Thing! Rule Finitism, Rule Scepticism and Rule Following." *Human Studies* 22 (2–4): 193–210.

### Week 5: Exploring the Laboratory

#### Readings

- Latour, Bruno, and Steve Woolgar. 1979. *Laboratory Life: The Social Construction of Scientific Facts*. Beverly Hills, CA: Sage Publications. [Chapter 2: An Anthropologist Visits the Laboratory]
- Knorr-Cetina, Karin D. 1983. "The Ethnographic Study of Scientific Work: Towards a Constructivist Sociology of Science." In *Science Observed: Perspectives on the Social Study of Science*, edited by Karin D Knorr-Cetina and Michael Mulkay, 115–40. London: Sage.
- Fujimura, Joan H. 1988. "The Molecular Biological Bandwagon in Cancer Research: Where Social Worlds Meet." *Social Problems* 35 (3): 261–83.

#### The 'Science Wars' Debate:

- Labinger, Jay A., and Harry Collins, eds. 2001. *The One Culture? A Conversation about Science*. Chicago and London: University of Chicago Press. [Part One: Positions]

#### Further Readings:

- Traweek, Sharon. 1988. *Beamtimes and Lifetimes: The World of High Energy Physicists*. Cambridge, Massachusetts: Harvard University Press. [Chapters 3: Pilgrim's Progress: Male Tales Told During a Life in Physics]
- Latour, Bruno. 1983. "Give Me a Laboratory and I Will Raise the World." In *Science Observed: Perspectives on the Social Study of Science*, edited by Karin D Knorr-Cetina and Michael Mulkay, 141–70. London and Beverly Hills: Sage.
- Gooday, Graeme. 2008. "Placing or Replacing the Laboratory in the History of Science?" *Isis* 99 (4): 783–95.
- Gross, Matthias. 2015. "Give Me an Experiment and I Will Raise a Laboratory." *Science, Technology, & Human Values* 41 (4): 613–34.
- Hacking, Ian. 1992. "The Self-Vindication of the Laboratory Sciences." In *Science as Practice and Culture*, edited by Andrew Pickering, 29–64. Chicago: University of Chicago Press.
- Doing, Park. 2007. "Give Me a Laboratory and I Will Raise a Discipline: The Past, Present, and Future Politics of Laboratory Studies." In *The Handbook of Science and Technology Studies*, edited by Edward J Hackett, Olga Amsterdamska, Michael Lynch, and Judy Wajcman, 3rd Edition, 279–96. Cambridge: MIT Press.
- Labinger, Jay A. 1997. "The Science Wars and the Future of the American Academic Profession." *Daedalus* 126 (4): 201–20.

## **Week 6: Demarcation, Boundary Work, and Boundary Objects**

### **Readings**

- Gieryn, Thomas F. 1983. "Boundary-Work and the Demarcation of Science from Non-Science: Strains and Interests in Professional Ideologies of Scientists." *American Sociological Review* 48: 781–95.
- Star, Susan Leigh, and James R Griesemer. 1989. "Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39." *Social Studies of Science* 19 (3): 387–420.
- Galison, Peter. 1997. "The Trading Zone: Coordinating Action and Belief." In *Image and Logic*, 781–844. Chicago: University of Chicago Press.
- Kaiser, David. 2005. "Making Tools Travel: Pedagogy and the Transfer of Skills in Postwar Theoretical Physics." In *Pedagogy and the Practice of Science: Historical and Contemporary Perspectives*, edited by David Kaiser, 41–74. Cambridge: MIT Press.

### *'What is a Boundary Object?' Debate:*

- Leigh Star, Susan. 2010. "This Is Not a Boundary Object: Reflections on the Origin of a Concept." *Science, Technology, & Human Values* 35 (5): 601–17.
- Fox, Nick J. 2011. "Boundary Objects, Social Meanings and the Success of New Technologies." *Sociology* 45 (1): 70–85.

### *Further Readings:*

- Galison, Peter. 2011. "Computer Simulations and the Trading Zone." In *From Science to Computational Science*, edited by Gabriele Gramelsberger, 118–57. Zürich: Diaphanes.
- Lamont, Michèle, and Virág Molnár. 2002. "The Study of Boundaries in the Social Sciences." *Annual Review of Sociology* 28 (1): 167–95.
- Barry, Andrew. 2006. "Technological Zones." *European Journal of Social Theory* 9 (2): 239–53.
- Star, Susan Leigh. 1989. "The Structure of Ill-Structured Solutions: Boundary Objects and Heterogeneous Distributed Problem Solving." In *Distributed Artificial Intelligence*, edited by Les Gasser and Michael Huhns, 37–54. San Francisco: Morgan Kaufmann.

## **Week 7: Actor-Network Theory**

### **Readings**

- Latour, Bruno. 2005. *Reassembling the Social. An Introduction to Actor-Network-Theory (ANT)*. Oxford: Oxford University Press.
- Callon, Michel. 1986. "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay." In *Power, Action and Belief: A New Sociology of Knowledge?*, edited by John Law, 196–233. Boston: Routledge and Kegan Paul.
- Law, John. 1986. "On the Methods of Long-Distance Control: Vessels, Navigation and the Portuguese Route to India." In *Power, Action and Belief: A New Sociology of Knowledge?*, edited by John Law, 234–63. Boston: Routledge and Kegan Paul.

### *The 'Epistemological Chicken' Debate:*

- Collins, Harry M, and S Yearley. 1992. "Epistemological Chicken." In *Science as Practice and Culture*, edited by Andrew Pickering, 301–26. Chicago: University of Chicago Press.
- Callon, Michel, and Bruno Latour. 1992. "Don't Throw the Baby Out with the Bath School! A Reply to Collins and Yearley." In *Science as Practice and Culture*, edited by Andrew Pickering, 343–68. Chicago: University of Chicago Press.

### *Further Readings:*

- Latour, Bruno. 1987. *Science in Action: How to Follow Scientists and Engineers Through Society*. Cambridge: Harvard University Press.

- Callon, Michel, and Bruno Latour. 1981. "Unscrewing the Big Leviathan: How Actors Macro-Structure Reality and How Sociologists Help Them to Do So." In *Advances in Social Theory and Methodology: Toward an Integration of Micro- and Macro-Sociologies*, edited by Karin D Knorr-Cetina and Aaron Cicourel, 277–303. Boston: Routledge & Kegan Paul.
- Woolgar, Steve. 1992. "Some Remarks about Positionism: A Reply to Collins and Yearley." In *Science as Practice and Culture*, edited by Andrew Pickering, 327–42. Chicago: University of Chicago Press.
- Bloor, David. 1999. "Anti-Latour." *Studies in History and Philosophy of Science Part A* 30 (1): 81–112.
- Latour, Bruno. 1999. "For David Bloor and beyond: Reply to Bloor's Anti-Latour." *Studies in History and Philosophy of Science Part A* 30 (1): 113–29.
- Amsterdamska, Olga. 1990. "Surely You Are Joking, Monsieur Latour!" *Science, Technology, & Human Values* 15 (4): 495–504.
- Ashmore, Malcolm. 1993. "Behaviour Modification of a Catflap: A Contribution to the Sociology of Things." *Kennis En Methode* 17 (2): 214–29.
- Mol, Annemarie. 2010. "Actor-Network Theory: Sensitive Terms and Enduring Tensions." *Kölner Zeitschrift Für Soziologie Und Sozialpsychologie. Sonderheft* 50: 253–69.
- Mol, Annemarie, and John Law. 1994. "Regions, Networks and Fluids: Anaemia and Social Topology." *Social Studies of Science* 24 (4): 641–71.
- Star, Susan Leigh. 1991. "Power, Technology, and the Phenomenology of Conventions: On Being Allergic to Onions." In *A Sociology of Monsters: Essays on Power, Technology, and Domination*, edited by John Law, 26–56. London: Routledge.

## **Week 8: The Social Construction of Technology**

### **Readings**

- Bijker, Wiebe E, Thomas P Hughes, and Trevor J Pinch, eds. 1987. *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge: MIT Press. [Chapters: Introduction, The Social Construction of Technology of Facts and Artifacts, The Evolution of Large-Technical Systems and The Social Construction of Bakelite: Toward a Theory of Invention]
- Winner, Langdon. 1988. "Do Artifacts Have Politics?" In *The Whale and the Reactor: A Search for Limits in an Age of High Technology: A Search for Limits in an Age of High Technology*, 19–39. Chicago: University of Chicago Press.
- Joerges, Bernward. 1999. "Do Politics Have Artefacts?" *Social Studies of Science* 29 (3): 411–31.

### *SCOT Debate:*

- Russell, Stewart. 1986. "The Social Construction of Artefacts: A Response to Pinch and Bijker." *Social Studies of Science* 16: 331–46.
- Pinch, Trevor J, and Wiebe E. Bijker. 1986. "Science, Relativism and the New Sociology of Technology: Reply to Russell." *Social Studies of Science* 16: 347–60.
- Winner, Langdon. 1993. "Upon Opening the Black Box and Finding It Empty: Social Constructivism and the Philosophy of Technology." *Science, Technology, & Human Values* 18 (3): 362–78.

### *Further Readings:*

- Bijker, Wiebe E., and Trevor J Pinch. 2012. "Preface to the Anniversary Edition." In *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, edited by Wiebe E. Bijker, Thomas P Hughes, and Trevor J Pinch, Anniversary Edition, xi–xxxiv. Cambridge: MIT Press.
- Kline, Ronald R, and Trevor J Pinch. 1996. "Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States." *Technology and Culture* 37 (4): 763–95.
- Staudenmaier, John M. 1985. *Technology's Storytellers. Reweaving the Human Fabric*. Cambridge, MA: The Society for the History of Technology and the MIT Press.

- Joerges, Bernward. 1988. "Large Technical Systems: Concepts and Issues." In *The Development of Large Technical Systems*, edited by Renate Mayntz and Thomas P Hughes, 9–36. Frankfurt am Main: Campus Verlag.
- Russell, Stewart, and Robin Williams. 2002. "Social Shaping of Technology: Frameworks, Findings and Implications for Policy." In *Shaping Technology, Guiding Policy: Concepts, Spaces and Tools*, edited by Knut H Sørensen and Robin Williams. Cheltenham, UK: Edward Elgar.
- Bardini, T, and A Horvath. 1995. "The Social Construction of the Personal Computer User." *Journal of Communication* 45 (3): 40–65.
- Woolgar, Steve. 1991. "The Turn to Technology in Social Studies of Science." *Science, Technology, & Human Values* 16 (1): 20–50.
- Buchanan, R A. 1991. "Theory and Narrative in the History of Technology." *Technology & Culture* 32 (2): 365–76.
- Law, John. 1991. "Theory and Narrative in the History of Technology: Response." *Technology and Culture* 32 (2): 377–84.
- Scranton, Philip. 1991. "Theory and Narrative in the History of Technology: Comment." *Technology & Culture* 32 (2): 385–93.

### ***Week 9: The Multiplicity of Objectivity***

#### **Readings**

- Daston, Lorraine, and Peter Galison. 2007. *Objectivity*. New York: Zone Books. [Chapter 1: Epistemologies of the Eye and Chapter 5: Structural Objectivity]
- Haraway, Donna J. 1991. "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." In *Simians, Cyborgs and Women: The Reinvention of Nature*, 183–201. New York: Routledge.
- Harding, Sandra. 2000. "Feminist Standpoint Epistemology." In *The Gender and Science Reader*, edited by Muriel Lederman and Ingrid Bartsch, 145–68. London: Routledge.
- Barad, Karen. 1999. "Agential Realism: Feminist Interventions in Understanding Scientific Practices." In *The Science Studies Reader*, edited by Mario Biagioli, 1–11. London: Routledge.
- Porter, Theodore M. 1992. "Quantification and the Accounting Ideal in Science." *Social Studies of Science* 22 (4): 633–51.

#### *Debate on Objectivity:*

- Porter, Theodore M. 2008. "The Objective Self." *Victorian Studies* 50 (4): 641–47.
- Tucker, Jennifer. 2008. "Objectivity, Collective Sight, and Scientific Personae." *Victorian Studies* 50 (4): 648–57.
- Anderson, Amanda. 2008. "Epistemological Liberalism." *Victorian Studies* 50 (4): 658–65.
- Daston, Lorraine, and Peter Galison. 2008. "Response: 'Objectivity' and Its Critics." *Victorian Studies* 50 (4): 666–77.

#### *Further Readings:*

- Harding, Sandra. 1992. "Rethinking Standpoint Epistemology: What Is 'Strong Objectivity'?" *The Centennial Review* 36 (3): 437–70.
- Daston, Lorraine. 1992. "Objectivity and the Escape from Perspective." *Social Studies of Science* 22 (4): 597–618.
- Haraway, Donna J. 1989. "Teddy Bear Patriarchy: Taxidermy in the Garden of Eden, New York City, 1908–1936." In *Primate Visions: Gender, Race, and Nature in the World of Modern Science*, 26–58. New York and London: Routledge.
- Schudson, Michael. 1997. "The Social Construction of 'Social Construction': Notes on 'Teddy Bear Patriarchy.'" In *From Sociology to Cultural Studies: New Perspectives*, edited by Elizabeth Long. Oxford: Wiley-Blackwell.
- Martin, Emily. 1991. "The Egg and the Sperm: How Science Has Constructed a Romance Based on Stereotypical Male-Female Roles" 16 (3): 489–501.



## **Week 10: Postcolonial Approaches of Technoscience**

### **Readings**

- Hart, Roger. 1999. "On the Problem of Chinese Science." In *The Science Studies Reader*, edited by Mario Biagioli, 189–201. London: Routledge.
- Seth, Suman. 2009. "Putting Knowledge in Its Place: Science, Colonialism, and the Postcolonial." *Postcolonial Studies* 12 (4): 373–88.
- Visvanathan, Shiv. 2006. "Alternative Science." *Theory, Culture & Society* 23 (2–3): 164–69.
- Raj, Kapil. 2007. *Relocating Modern Science: Circulation and the Construction of Knowledge in South Asia and Europe, 1650-1900*. New York: Palgrave Macmillan. [Chapter: When Human Travelers Become Instruments: The Indo-British exploration of Central Asia in the Nineteenth Century]
- Escobar, Arturo. 2011. "Development and the Anthropology of Modernity." In *The Postcolonial Science and Technology Studies Reader*, edited by Sandra Harding, 269–89. Durham and London: Duke University Press.
- Sardar, Ziauddin. 2011. "Islamic Science: The Contemporary Debate." In *The Postcolonial Science and Technology Studies Reader*, edited by Sandra Harding, 373–79. Durham and London: Duke University Press.
- Anderson, Warwick. 2002. "Introduction: Postcolonial Technoscience." *Social Studies of Science* 32 (5/6): 643–58.

### *The 'Weak and Strong Complementarity between Gender and Postcolonial Science and Technology Studies' Debate:*

- Harding, Sandra. 2011. "Introduction: Beyond Postcolonial Theory: Two Undertheorized Perspectives on Science and Technology." In *The Postcolonial Science and Technology Studies Reader*, edited by Sandra Harding. Durham and London: Duke University Press.
- Parashar, Swati. 2016. "Feminism and Postcolonialism: (En)Gendering Encounters." *Postcolonial Studies* 19 (4): 371–77.

### *Further Readings:*

- Said, Edward W. 1979. *Orientalism*. New York: Random House.
- Needham, Joseph. 1954—. *Science and Civilisation in China* (Series). Cambridge: Cambridge University Press.
- Harding, Sandra, ed. 2011. *The Postcolonial Science and Technology Studies Reader*. Durham and London: Duke University Press.
- Prakash, Gyan. 1999. *Another Reason: Science and the Imagination of Modern India*. Princeton: Princeton University Press.
- Nandy, Ashis. 1980. *Alternative Sciences: Creativity and Authenticity in Two Indian Scientists*. New Delhi: Allied.
- Visvanathan, Shiv. 1997. *A Carnival for Science: Essays on Science, Technology and Development*. New Delhi; New York: Oxford University Press.
- Sardar, Ziauddin, ed. 1984. *The Touch of Midas: Science, Values, and Environment in Islam and the West*. Mapusa, Goa: The Other India Press.
- Gilley, Bruce. 2017. "The Case for Colonialism." *Third World Quarterly*, 1–17.  
[http://www.web.pdx.edu/~gilleyb/2\\_The\\_case\\_for\\_colonialism\\_at2Oct2017.pdf](http://www.web.pdx.edu/~gilleyb/2_The_case_for_colonialism_at2Oct2017.pdf). [This Viewpoint essay was withdrawn at the request of the academic journal editor in agreement with the author of the essay.]
- Special Issue of *Postcolonial Studies*, on 'Feminism Meets Postcolonialism: Rethinking Gender, State and Political Violence', Volume 19, Issue 4, 2016.

## **Week 11: Interventions in Technoscientific Practice**

### **Readings**

- Woodhouse, Edward, David Hess, Steve Breyman, and Brian Martin. 2002. "Science Studies and Activism: Possibilities and Problems for Reconstructivist Agendas." *Social Studies of Science* 32 (2): 297–319.

- Zuiderent-Jerak, Teun, and Casper Bruun Jensen. 2007. "Editorial Introduction: Unpacking 'Intervention' in Science and Technology Studies." *Science as Culture* 16 (3): 227–35.
- Bijker, Wiebe. 2017. "Constructing Worlds: Reflections on Science, Technology and Democracy (and a Plea for Bold Modesty)." *Engaging Science, Technology, and Society* 3: 315–31.
- Fortun, Kim, and Scott Frickel. 2011. "Making a Case for Disaster Science and Technology Studies." *An STS Forum on the East Japan Disaster*. <https://fukushimaforum.wordpress.com/online-forum-2/online-forum/making-a-case-for-disaster-science-and-technology-studies/>.

*The STS and Researcher Intervention Strategies Debate:*

- Martin, Brian. 2016. "STS and Researcher Intervention Strategies." *Engaging Science, Technology, and Society* 2: 55–66.
- Liboiron, Max. 2016. "Care and Solidarity Are Conditions for Interventionist Research." *Engaging Science, Technology, and Society* 2: 67–72.
- Zuiderent-Jerak, Teun. 2016. "If Intervention Is Method, What Are We Learning?" *Engaging Science, Technology, and Society* 2: 73–82.
- Martin, Brian. 2016. "STS Interventions: Preparing, Defending, Learning." *Engaging Science, Technology, and Society* 2: 83–87.

*Further Readings:*

- Oreskes, Naomi, and Erik M. Conway. 2007. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*. New York and London: Bloomsbury Press.
- Asdal, Kirstin, Ingunn Moser, and Brita Brenna, eds. 2007. *Technoscience: The Politics of Interventions*. Oslo: Fagbokforlaget.
- Special Issue of *Science and Culture*, on 'Unpacking 'Intervention' in Science and Technology Studies', Volume 16, Issue 3, 2007.
- Smith, Barbara Herrnstein. 1994. "The Unquiet Judge: Activism without Objectivism in Law and Politics." In *Rethinking Objectivity*, edited by Allan Megill, 289–311. Durham: Duke University Press.
- Bijker, Wiebe E. 2003. "The Need for Public Intellectuals: A Space for STS: Pre-Presidential Address, Annual Meeting 2001, Cambridge, MA." *Science, Technology, & Human Values* 28 (4): 443–50.
- Akera, Atsushi, and Anto Mohsin. 2014. "Finding a Place for Engineering Studies in Disaster STS? Creating the STS Forum on the 2011 East Japan Disaster." *Engineering Studies* 6 (3): 191–209.
- Scott, Pam, Evelleen Richards, and Brian Martin. 1990. "Captives of Controversy: The Myth of the Neutral Social Researcher in Contemporary Scientific Controversies." *Science, Technology, & Human Values* 15 (4): 474–94.
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**Week 12: The Crisis of Expertise and the Public Understanding of Science**

**Readings**

- Wynne, B. 1992. "Misunderstood Misunderstanding: Social Identities and Public Uptake of Science." *Public Understanding of Science* 1 (3): 281–304.
- Collins, H. M., and Robert Evans. 2002. "The Third Wave of Science Studies: Studies of Expertise and Experience." *Social Studies of Science* 32 (2): 235–96.

### *The 'Third Wave of Science Studies' Debate:*

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### *Further Readings:*

- Bijker, Wiebe E, Roland Bal, and Ruud Hendriks. 2009. *Paradox of Scientific Authority: The Role of Scientific Advice in Democracies*. Cambridge, MA: MIT Press.
- Hilgartner, Stephen. 2000. *Science on Stage: Expert Advice as Public Drama*. Stanford: Stanford University Press.
- Funtowicz, Silvio, and Jerome Ravetz. 1993. "Science for the Post-Normal Age." *Futures* 25 (7): 739–55.
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- Stirling, Andy. 2007. "'Opening Up' and 'Closing Down': Power, Participation, and Pluralism in the Social Appraisal of Technology." *Science, Technology, & Human Values* 33 (2): 262–94.

### **Week 13: The Ontological Turn in STS**

#### **Readings**

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- Woolgar, Steve, and Javier Lezaun. 2013. "The Wrong Bin Bag: A Turn to Ontology in Science and Technology Studies?" *Social Studies of Science* 43 (3): 321–40.

#### *Debates on the Ontological Turn:*

- Holbraad, Martin, and Morten Axel Pedersen. 2014. "The Politics of Ontology." *Theorizing the Contemporary, Cultural Anthropology Website*. <https://culanth.org/fieldsights/461-the-politics-of-ontology>.
- Pedersen, Morten Axel. 2012. "Common Nonsense: A Review of Certain Recent Reviews of the 'Ontological Turn.'" *Anthropology of This Century* 5. [http://aotcpress.com/articles/common\\_nonsense/](http://aotcpress.com/articles/common_nonsense/).

#### *Further Readings:*

- Henare, Amiria, Martin Holbraad, and Sari Wastell. 2007. *Thinking Through Things: Theorising Artefacts Ethnographically*. London: Routledge.
- Jensen, Casper Bruun, and Kjetil Rødje, eds. 2009. *Deleuzian Intersections: Science, Technology, Anthropology*. Oxford: Berghahn Books.
- Special Issue of *Social Studies of Science*, on 'A Turn to Ontology in Science and Technology Studies?', Volume 43, Issue 3, June 2013.
- Paleček, Martin, and Mark Risjord. 2012. "Relativism and the Ontological Turn within Anthropology." *Philosophy of the Social Sciences* 43 (1): 3–23.

- Carrithers, Michael, Matei Candea, Karen Sykes, Martin Holbraad, and Soumhya Venkatesan. 2010. "Ontology Is Just Another Word for Culture: Motion Tabled at the 2008 Meeting of the Group for Debates in Anthropological Theory, University of Manchester." *Critique of Anthropology* 30 (2): 152–200.
- Special Section of *The Cambridge Journal of Anthropology* on 'Internal Others: Ethnographies of Naturalism', Volume 30, Issue 2, Autumn 2012.

#### ***Week 14: The Politics of Science and the Making of Sociotechnical Futures***

##### **Readings**

- Jasanoff, Sheila. 1996. "Beyond Epistemology: Relativism and Engagement in the Politics of Science." *Social Studies of Science* 26: 393–418.
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- Jasanoff, Sheila, and Sang-Hyun Kim. 2009. "Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea." *Minerva* 47 (2): 119–46.
- Hedgcoe, Adam M., and Paul A. Martin. 2008. "Genomics, STS, and the Making of Sociotechnical Futures." In *Handbook of Science and Technology Studies*, edited by Edward J. Hackett, Olga Amsterdamska, Michael Lynch, and Judy Wajcman, 3rd ed. Cambridge: MIT Press.

##### *The Matters of Concern vis-à-vis Matters of Care Debate:*

- Latour, Bruno. 2004. "Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern." *Critical Inquiry* 30 (2): 225–48.
- de la Bellacasa, Maria Puig. 2011. "Matters of Care in Technoscience: Assembling Neglected Things." *Social Studies of Science* 41 (1): 85–106.

##### *Further Readings:*

- Barry, Andrew. 2001. *Political Machines: Governing a Technological Society*. New York: Athlone Press.
- Jasanoff, Sheila. 2004. *States of Knowledge: The Co-Production of Science and the Social Order*. New York: Routledge.
- Edwards, Paul. 2011. "Data Wars." In *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming*, 287–322. Cambridge: MIT Press.
- Epstein, Steven. 1996. *Impure Science. Aids, Activism, and the Politics of Knowledge*. Berkeley, CA: University of California Press.
- Ezrahi, Yaron. 1990. *The Descent of Icarus: Science and the Transformation of Contemporary Democracy*. Cambridge, MA: Harvard University Press.

#### ***Week 15: Wrap Up: Peer-review session***

In this session, we will revisit the debates and explore them using draft versions of final essays written by students.

##### *Further Readings:*

- Section in *Engaging Science and Technology Studies* on 'Traces: Talking STS', Volume 4, 2018.

#### **Submission of final essay is due at the end of the semester.**

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- Lynch, Michael, ed. 2012. *Science and Technology Studies (Critical Concepts in the Social Sciences)*. London and New York: Routledge.
- Syllabus for *STS 7111: Introduction to Science and Technology Studies*, taught by

- Rebecca Slayton and Malte Zeiwitz in Fall 2016
- Michael Lynch and Malte Zeiwitz in Fall 2014
- Peter Dear in Fall 2012

at the Department of Science and Technology Studies, Cornell University.

## Topics that were left behind:

### *Additional Weeks*

#### 1. *Pre-history: Background in History, Philosophy, and Sociology of Science*

##### Readings

- Lynch, Michael. 2012. "Introduction." In *Science and Technology Studies (Critical Concepts in the Social Sciences)*, edited by Michael Lynch. London and New York: Routledge.
- Mannheim, Karl. 1936. "The Transition from the Theory of Ideology to the Sociology of Knowledge: The Non-Evaluative Conception of Ideology." In *Ideology and Utopia: An Introduction to the Sociology of Knowledge*, 75–87. New York: Harvest Books.
- Merton, Robert K. 1973. *The Sociology of Science: Theoretical and Empirical Investigations*. Edited by N W Storer. Chicago: University of Chicago Press. [Chapters: Science and the Social Order and The Normative Structure of Science].

##### *Debate on Mertonian Norms:*

- Barnes, Barry, and R G A Dolby. 1970. "The Scientific Ethos: A Deviant Viewpoint." *European Journal of Sociology / Archives Européennes de Sociologie / Europäisches Archiv Für Soziologie* 11 (1): 3–25.
- Mitroff, Ian I. 1974. "Norms and Counter-Norms in a Select Group of the Apollo Moon Scientists: A Case Study of the Ambivalence of Scientists." *American Sociological Review* 39 (4): 579–95.
- Merton, Robert K. 1976. "The Ambivalence of Scientists: A Postscript." In *Sociological Ambivalence and Other Essays*, edited by Robert K Merton, 56–64. New York: Free Press.

##### *Further Readings:*

- Merton, Robert K. 1968. "The Matthew Effect in Science." *Science* 159 (3810): 56–63.
- Bourdieu, Pierre. 1975. "The Specificity of the Scientific Field and the Social Conditions of the Progress of Reason." *Social Science Information* 14 (6): 19–47.
- Edgar Zilzel (2000) 'The Sociological Roots of Science,' *The American Journal of Sociology* 47: 544–562. Reprinted in *Social Studies of Science* 30(6), 2000: 935–949.
- Mitroff, Ian I, and Ralph H Kilmann. 1977. "Systemic Knowledge: Toward an Integrated Theory of Science." *Theory and Society* 4 (1): 103–29.
- Mulkay, Michael. 1976. "Norms and Ideology in Science." *Social Science Information* 15 (4–5): 637–56.

#### 2. *A classic exemplar of SSK*

##### Readings

- Shapin, Steven, and Simon Schaffer. 1985. *Leviathan and the Air-Pump: Hobbes, Boyle and the Experimental Life*. Princeton: Princeton University Press.
- For Schaffer's explanation of the methodological connection with SSK and laboratory studies, you can listen to an episode on Canadian Broadcasting Corporation radio program, 'How to Think about Science.' It is available at: <http://www.cbc.ca/player/play/1479821350>

##### *Debates on Leviathan and the Air-pump:*

- Shapin, Steven, and Simon Schaffer. 2011. “Up for Air: Leviathan and the Air-Pump a Generation On.” In *Leviathan and the Air-Pump: Hobbes, Boyle and the Experimental Life.*, xi–xlx. Princeton: Princeton University Press.
- Latour, Bruno. 1990. “Postmodern? No Simply Amodern. Steps Towards an Anthropology of Science. An Essay Review.” *Studies in the History and Philosophy of Science* 21: 145–71. <http://www.bruno-latour.fr/node/272>.
- Haraway, Donna J. 1997. “Modest\_Witness@Second\_Millennium.” In *Modest\_Witness@Second\_Millennium. FemaleMan\_Meets\_OncoMouse<sup>TM</sup>: Feminism and Technoscience*, 23–48. New York: Routledge.

*Further Readings:*

- Achbari, Azadeh. 2017. “The Reviews of Leviathan and the Air-Pump: A Survey.” *Isis* 108 (1). The University of Chicago Press: 108–16.
- Shapin, Steven. 1984. “Pump and Circumstance: Robert Boyle’s Literary Technology.” *Social Studies of Science* 14 (4): 481–520.
- Shapin, Steven. 1989. “The Invisible Technician.” *American Scientist* 77 (6): 554–63.
- Sargent, Rose-Mary. 1988. “Explaining the Success of Science.” *PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association* 1988 (1). The University of Chicago Press: 55–63.
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- Hacking, Ian. 1991. “Artificial Phenomena.” *The British Journal for the History of Science* 24 (2). Cambridge University Press: 235–41.
- Wootton, David, Michael Hunter, and Ritchie Robertson. 2015. “Leviathan and the Air Pump: Thirty Years On.” *TORCH | The Oxford Research Centre in the Humanities*. <https://podcasts.ox.ac.uk/leviathan-and-air-pump-thirty-years>.