# HPSC0011

# STS Perspectives on Big Problems

# Course Syllabus

2021-22 session | STS Staff, Course Coordinator Dr. Carina Fearnley | c.fearnley@ucl.ac.uk

## Course Information

This module introduces students to the uses of STS in solving big problems in the contemporary world. Each year staff from across the spectrum of STS disciplines – History, Philosophy, Sociology and Politics of Science –come together to teach students how different perspectives can shed light on issues ranging from climate change to nuclear war, private healthcare to plastic pollution. Students will develop research and writing skills, and assessment will consist of a formative essay plan and a final essay. Students also keep a research notebook across the course of the module.

This year's topic is Extinction.

## Basic course information

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| Moodle Web site: | https://moodle.ucl.ac.uk/course/view.php?id=7420 |
| Assessment: | Formative assessment and essay |
| Timetable: | See online timetable |
| Prerequisites: | None |
| Required texts: | Readings listed below |
| Course tutor(s): | STS Staff, course coordinator Dr Carina Fearnley |
| Contact: | c.fearnley@ucl.ac.uk |
| Web: | https://moodle.ucl.ac.uk/course/view.php?id=7420 |
| Office location: | Online for TERM 1 |

## Schedule

| Week | UCL Week | Date | Topic | Activity / Guest Lecture |
|---|---|---|---|---|
| 1 | 6 | 6/10 | Extinction as a 'Big Problem' and the Dinosaur Wars. | Dr Carina Fearnley |
| 2 | 7 | 13/10 | Counting the Sixth Extinction | Prof Joe Cain & Prof Jon Agar |
| 3 | 8 | 20/10 | Representing Extinction via Popular Media | Prof Charlotte Sleigh & Dr Jean-Baptiste Gouyon |
| 4 | 9 | 27/10 | How do policymakers manage extinction and whose knowledge counts?<br>&<br>Approaching the Assessment | Dr Melanie Smallman<br><br>Prof Joe Cain |
| 5 | 10 | 3/11 | The ethics and aesthetics of extinction: what landscape does it paint? | Prof Phyllis Ilari & Dr Chiara Ambrosio |
| | 11 | 10/11 | **Reading Week** | |
| 6 | 12 | 17/11 | Public engagement with extinction: The Meaning of Life (and its End) | Prof Joe Cain & Dr Carina Fearnley |
| 7 | 13 | 24/11 | Colonizing hope: How modern imaginations of fear extinguish hope.<br>&<br>Technological fixes and de-extinction | Dr Cian O'Donovan<br><br>Prof Jack Stilgoe |
| 8 | 14 | 1/12 | 2020 hindsight on the extinction of pathogens: improving public health and eradicating diseases. | Dr Cristiano Turbil & Dr Erman Sozudogru |
| 9 | 15 | 8/12 | Historical and anthropological approaches to global extinction issues. | Dr Jenny Bulstrode & Dr Noémi Tousignant |
| 10 | 16 | 15/12 | The End of Humanity and The End of the World<br>&<br>Module reflections | Prof Simon Werrett & Prof Brian Balmer<br><br>Dr Carina Fearnley |

## Assessments

**Summary**

| | Description | Deadline | Word limit | Deadline for Tutors to provide Feedback |
|---|---|---|---|---|
| **0** | Formative Essay Plan | 1 Dec 2021 | 1,000 | As advised |
| **100%** | Essay | 12 Jan 2021 | 2,500 | As advised |

## Assignments

**Specific Criteria for Assessment for this Module: See HPSC0011 Assessment Advice on Moodle**

## Aims & Objectives

### Aims:

To demonstrate and explore the ways that STS provides perspective that contribute to the understanding of major problems facing humanity

### Objectives:

- The possession of empirical and theoretical knowledge of big problems from interdisciplinary STS perspectives, and the written communication skills to account for such knowledge
- The skills to analyse such knowledge in order to propose persuasive cases for potential contributions to solutions to such problems
- A deeper grasp of the varied character of STS and its interdisciplinary relevance to a wider world

## Schedule of Sessions

Below is the outline and key readings for each session.

**Week 1 (6 Oct)**

**Extinction as a 'Big Problem' and the Dinosaur Wars**
**Dr Carina Fearnley**

*Extinction: the fact or process of a species, family, or other group of animals or plants becoming extinct.*

This session will introduce the course, with an overview of course content, structure and assessments. We will explore what extinction means, why it is important, why many refer to extinction as a 'problem', and the role of different disciplinary perspectives (including STS) in both framing, defining and tackling extinction. In the second part of the session, we will explore the many extinction events throughout geological history, and the Holocene extinction, (the 6th mass extinction or Anthropocene extinction) that unlike other extinction events will be a result of human activity. Finally, we explore the debate around what killed the dinosaurs in a vicious 'war' between scientists that highlights the controversy often involved in the natural sciences, and the role of the expert. Volcanoes are involved and it will be explosive.

Essential Reading
Please watch: 'Why the Dinosaurs' Extinction is an Ongoing Puzzle'
https://www.youtube.com/watch?v=nsTXZuPKuAU

And read: The Nastiest Feud In Science
https://www.theatlantic.com/magazine/archive/2018/09/dinosaur-extinction-debate/565769/

Background Reading
McGuire, B. (2006). Global catastrophes: a very short introduction. OUP Oxford.
Courtillot, V. (2002). Evolutionary catastrophes: the science of mass extinction. Cambridge University Press (for the very keen).

**Week 2 (13 Oct)**

**Counting the Sixth Extinction**
**Prof Jon Agar & Prof Joe Cain**

In this session, we'll develop the theme "units of analysis". Which units are used in extinction studies? How do we decide which are the right units to use? What are the strengths and weaknesses of using one unit rather than another? In the second half we will be tracing how scientists measure how threatened a species is, and how and why this measurement has changed over time.

Essential Preparation

**Watch**:
'Units of classification' video available on Moodle

**Read**:
FAO-UN. 2020. The State of the World's Forests: Forests, Biodiversity, and People (Rome: Food and Agriculture Organization of the United Nations). DOI: 10.4060/ca8642en
http://www.fao.org/state-of-forests/ Read selectively. Crucially, we mean "sample". It's a complex report, so concentrate perhaps on one chapter (e.g., chapter 3). Identify the units of analysis in that report, and ask yourself the critical questions above about those units: selection, decisions, strengths and weaknesses. Come to class prepared to offer your answers for those questions.

**Activity**:
By searching for Wikipedia pages of animals and plants, find ONE EXAMPLE EACH of organisms with 'conservation status' EX, EW, CR, EN, VU, NT and LC. The 'conservation status' can be found in the box on the top right-hand side of a species Wikipedia page. Bring notes to class.

Background Reading
For more on the Red Books: The rarest important books of the twentieth century? | UCL STS Observatory

Leakey, Richard. 1996. The Sixth Extinction: Biodiversity and Its Survival (London: Pheonix). ISBN: 1857994736. UCL Library.

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**Week 3 (20 Oct)**

**Representing Extinction via Popular Media**
**Prof Charlotte Sleigh & Dr Jean-Baptiste Gouyon**

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Ever since people began digging up fossils of ancient animals, the notion of extinct species has captured the popular imagination. As we will discuss in this session, extinction is a powerful notion in popular media. From Jules Verne or Arthur Conan Doyle to Steven Spielberg or David Attenborough, the ability to evoke in a realistic fashion extinct forms of life has been a demonstration of cognitive authority for many a creator of popular scientific content. But mobilising the possibility of extinction is also a means for producers of mass media contents of attempting to drive political action. What representations of extinction do we find in mass media, past and present? What do they mean? How are they used? This are some of the questions we will consider.

Essential readings:

**Read**:
Scott KD, White AM. Unnatural History? Deconstructing the Walking with Dinosaurs Phenomenon. *Media, Culture & Society*. 2003;25(3):315-332. doi:10.1177/0163443703025003002
Born, Dorothea. "Bearing witness? Polar bears as icons for climate change communication in National Geographic." Environmental Communication 13.5 (2019): 649-663.

**Watch**:
The Smell of Prey | Walking with Dinosaurs in HQ | BBC: The top predator of the Jurassic period, Allosaurs, tracks a crèche of sauropods, before facing off against a 7-ton male Stegosaurus.
https://youtu.be/C0r5P-PzIPU

https://youtu.be/Fj8IQX693v4 (WWF adopt-a-bear ad)
https://youtu.be/VRZNA_3K2zA (Nissan Leaf polar bear ad)

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**Week 4 Session 5 (27 Oct)**

**How do policymakers manage extinction and whose knowledge counts?**
**Dr Melanie Smallman**

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Extinction and loss of biodiversity are issues that need to be tackled on a global or supernational scale. So how do we come to agreements on what the science says at this scale? Is science something that all sides can agree on and use as a starting point for discussions, or is it inherently political? Whose knowledge counts and how does decision making at this level gain legitimacy? As the class meets in the run up to the COP26 meeting in Glasgow, we will consider what these issues mean for the arrangement if organisations such as the UN.

Essential Reading
Montana, J. (2016). 'How IPBES Works: The Functions, Structures and Processes of the Intergovernmental Platform on Biodiversity and Ecosystem Services.' C-EENRG Working Papers, 2016(2): 1-23. Cambridge Centre for Environment, Energy and Natural Resource Governance, University of Cambridge.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2778701

Commission launches knowledge centre to reverse biodiversity loss and protect Europe's ecosystems:
https://ec.europa.eu/jrc/en/news/commission-launches-knowledge-centre-reverse-biodiversity-loss-and-protect-europe-s-ecosystems

Why indigenous voices must be heard in the global debate about biodiversity:
https://www.opendemocracy.net/en/oureconomy/why-indigenous-voices-must-be-heard-global-debate-about-biodiversity

Background Reading
IPCC: a description of the processes by which IPCC reports are produced
http://www.ipcc.ch/organization/organization_procedures.shtml

Advanced Reading
Suryanarayanan, S. and Kleinman, D.L. (2013) 'Be(e)coming experts: The controversy over insecticides in the honey bee colony collapse disorder', *Social Studies of Science*, 43(2), pp. 215–240. doi:10.1177/0306312712466186.

**Approaching the Assessment**
**Prof Joe Cain**

In this session you will be guided through the assignment with tips on how to prepare the essay and how to integrate STS approaches to the essay questions. This will also be an opportunity to ask any questions about the assignment.

**Week 5 Session 6 (3 Nov)**

**The ethics and aesthetics of extinction: what landscape does it paint?**
**Prof Phyllis Ilari & Dr Chiara Ambrosio**

In this session we will explore extinction from two complementary philosophical perspectives: environmental ethics and environmental aesthetics.

The first part of the lecture will present how extinction and other environmental issues have challenged certain modes of ethical thinking, particularly 'anthropogenic' ethical approaches that focus on humans alone, or on a very small number of privileged people. We will also examine the difference between objecting to extinctions on 'instrumental' grounds, because extinctions are bad for human beings, versus on 'intrinsic' grounds, i.e. for the sake of the extinct living things themselves.

The second part of the lecture will explore the aesthetics of the Extinction Rebellion (XR) movement. Building on a distinctive visual identity (think of the XR logo) and on a series of artistic interventions inspired by the Situationist movement of the late 1960s, XR has seen the involvement and active collaboration of art practitioners and art collectives in its events and initiatives. We will investigate how XR's imagery and performances draw on a carefully constructed aesthetics to convey the message of 'urgency' associated to its actions, but we will also interrogate it by placing it in dialogue with the aesthetics of other environmental activist groups, past and present.

Essential Readings

Arne Naess (1973) 'The shallow and the deep, long-range ecology movement. A summary', *Inquiry*, 16:1-4, 95-100, https://doi.org/10.1080/00201747308601682

T.J. Demos (2020), "Extinction Rebellions", *Afterimage*, 47 (2), p.14-20 (available via the UCL Library catalogue)

Background Readings

John Bryant, Linda Baggott la Velle and John Searle (eds.) (2002), *Bioethics for Scientists*, Chichester: John Wiley & Sons.

See especially Chapter 3, Christopher Southgate, 'Introduction to Environmental Ethics' https://ucl-new-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=TN_pq_ebook_centralEBC138346&context=PC&vid=UCL_VU2&lang=en_US&search_scope=CSCOP_UCL&adaptor=primo_central_multiple_fe&tab=local&query=any,contains,bioethics%20for%20scientists%20,%20bryant%20j%20a&offset=0

Kadish Morris, "The Defiant Art and Design of Extinction Rebellion", *Frieze*, 11 October 2019. Available online at: https://www.frieze.com/article/defiant-art-and-design-extinction-rebellion

Gretchen Coombs (2020), "It's (Red) Hot Outside! The Aesthetics of Climate Change Activists Extinction Rebellion" *The Journal of Public Space* Vol 5 No 4 (2020), pp 123-136. Available online at https://www.journalpublicspace.org/index.php/jps/article/view/1407/819

**** READING WEEK ****

**Week 6 (17 Nov)**

**Public engagement with extinction: The Meaning of Life (and its End).**
**Prof Joe Cain and Dr Carina Fearnley**

In 2021, we think of extinction as an unqualified "bad". But was this always the case? Who discovered extinction as a phenomenon? What impact did it make on their understanding of the world around them? Of course, extinction has meaning beyond biology. In this session, we investigate some of the themes dominating episodes in which "thinking about extinction" loomed large. What happens when we think of extinction as "natural" or "normal" or "good" in the history of life and simply part of evolution's central narratives?

How do individuals and communities understand Deep Time? A relatively short-term perspective is dominant in contemporary societies as they face the complicated ongoing consequences of living in the Anthropocene Era. Using the case study of the project 'Orkney: Beside the Ocean of Time' we will explore how the public can relate to deep time processes such as the origins of life as well as extinction that are very difficult to grasp due to the billions of years timescales involved. We will explore how interdisciplinary tools can be used to create narratives in the public's mind that can help them reflect on what it means to be in the Anthropocene, and help consider what our environmental future may look like.

Essential reading
Gould, Stephen Jay. 1989. *Wonderful life: the Burgess shale and the nature of history* (New York: W.W. Norton), pp. 23-52, "The iconography of an expectation". Article in 0011 Reading List. Book in UCL Library.
Irvine, R. D., Downing, N., Bevan, A., & Fearnley, C. (2021). Time Horizon: Intersections of Deep Time and Biographical Time on the West Shore, Stromness, Orkney. GeoHumanities, 1-21.
Discussion questions: (1) What does Gould conclude about the "meaning of life," and (2) what is main pattern in evolution's central narratives?

Background Reading
Barrow, Mark. 2009. *Nature's Ghosts: Confronting Extinction from the Age of Jefferson to the Age of Ecology* (Chicago: University of Chicago Press).
Brantlinger, Patrick. 2003. *Dark Vanishings: Discourse on the Extinction of Primitive Races, 1800-1930* (Ithaca, NY: Cornell University Press).
Panciroli, Elsa. 2021. *Beasts Before Us: The Untold Story of Mammal Origins and Evolution* (London: Bloomsbury Sigma).
Powell, Miles A. 2016. *Vanishing America: Species Extinction, Racial Peril, and the Origins of Conservation* (Cambridge, MA: Harvard University Press).
Rudwick, Martin. 1992. *Scenes from Deep Time* (Chicago: University of Chicago Press).
Sepkoski, David. 2020. *Catastrophic Thinking: Extinction and the Value of Biodiversity from Darwin to the Anthropocene* (Chicago: University of Chicago Press).

**Week 7 (24 Nov)**

**Colonizing hope: How modern imaginations of fear extinguish hope.**
**Dr Cian O'Donovan**

**Technological fixes and de-extinction**
**Dr Jack Stilgoe**

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Lecture 1: *How science, technology and innovation extinguish hope that many future worlds may be possible.*

Hopes that many alternative futures are possible are essential for achieving social progress. In this lecture we will look at how civil society movements like Extinction Rebellion use science and technology to imagine certain kinds of futures. We will discuss how science, rather than being a force for liberation and emancipation, often provokes fear and despair. Rather than generate hope, we will investigate how science, technology and innovation narrows the range of what might be possible. Implications for issues such as climate change, biodiversity loss, covid-19 and contemporary forms of colonialism will be debated.

Essential Reading
Solnit, R. (2016). 'Hope is an embrace of the unknown.' Rebecca Solnit on living in dark times. http://rebeccasolnit.net/essay/hope-is-a%E2%80%8Bn-embrace-of-the-unknown%E2%80%8B-rebecca-solnit-on-living-in-dark-times/

Background Reading
Beck, S., Jasanoff, S., Stirling, A., & Polzin, C. (2021). The governance of sociotechnical transformations to sustainability. Current Opinion in Environmental Sustainability, 49, 143–152. https://doi.org/10/gkpsjp

Extinction Rebellion. (2021). FAQs. Extinction Rebellion UK. https://extinctionrebellion.uk/the-truth/faqs/

Lecture 2: In this class, we will look at the idea of bringing extinct species back to life. Does de-extinction work? Would it be a good idea even if it did work? Could it cause more problems than it solves? What counts as a solution anyway? Have these people not seen Jurassic Park? The idea of de-extinction tells us a lot about how problems are imagined and how they are connected to technological innovation in the 21st Century.

Essential Reading: Zimmer, C. (2013). Bringing them back to life. National Geographic, 223(4), 28-41. https://faculty.mtsac.edu/cbriggs/Bringing%20them%20back%20to%20life%202013.pdf

Background Reading: Weinberg, A. M. (1966). Can technology replace social engineering?. Bulletin of the Atomic Scientists, 22(10), 4-8.

TED (2013) Stewart Brand: the dawn of de-extinction. Are you ready?http://www.ted.com/talks/stewart_brand_the_dawn_of_de_extinction_are_you_ready.html

**Week 8 (1 Dec)**

**2020 hindsight on the extinction of pathogens: improving public health and eradicating diseases.**
**Dr Cristiano Turbil & Dr Erman Sozudogru**

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Lecture 1: In this session, we will examine the concept of disease eradication. The process of eradication often involves the deliberate extinction of a pathogen or a vector. The aim of this session is to address the ethical questions linked to disease eradication. Can extinction ever be a good thing? We will explore some case studies, including smallpox, malaria and covid-19 and discuss the eradication of diseases in light of the broader extinction debate.

Lecture 2: In this session, we will explore the medical, social and political debates surrounding disease eradication. We will do this by using the history of smallpox, the only human disease so far eradicated, as a case study. In class, we will look at the complexity behind the implementation of public health norms aimed at controlling, managing, and eradicating a disease drawing from both contemporary and 19th-century sources.

Essential reading

Caplan, A.L., 2009. Is disease eradication ethical? The Lancet (British edition), 373(9682), pp.2192–2193.
Nadja Durbach, ''They might as well brand us': working-class resistance to compulsory vaccination in Victorian England', Social History of Medicine, 13, (2000), 45-62.

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**Week 9 (8 Dec)**

**Historical and anthropological approaches to extinction.**
**Dr Jenny Bulstrode & Dr Noémi Tousignant**

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This session draws on historical and anthropological approaches to analyse extinction. The session will consist of two short pre-recorded lectures by Dr Jenny Bulstrode and Dr Noémi Tousignant respectively, followed by a joint discussion session in person with small group work. The lectures will introduce key concepts, frame readings and raise questions for critical discussion in person.

Lecture 1: Dr Noémi Tousignant - 'Ethnographies of extinction'
How does extinction change what it means to be human, social and natural? How are our relations, with each other and with nonhumans, altered by the loss of species? And what are the different "ways of knowing" ecological transformation? This section will look at how anthropologists have studied "extinction" -- particularly by forming alliances with artists, scientists, Indigenous peoples and even other species – as a historical frame, a lived experience and an invitation to see and live differently.

Essential Reading: Van Dooren, & Rose, (2017); Kirskey, (2016); Mitchell &Theriault (2020).

Lecture 2: Dr Jenny Bulstrode - 'Extinction and the future of ecology'
Experts now increasingly recognise that 'without [Indigenous Knowledges], without cultural diversity, there can be no biological diversity, and without biodiversity there will be no human habitat, no future for anyone'. In their recent article, Trisos, Auerbach & Katti are explicit: to learn from Indigenous

Knowledges, academic ecological researchers must first 'know your histories'. This session considers the crucial importance of critical histories to future science policy. Essential Reading: Turnbull, (2009); Trisos, Auerbach, & Katti, (2021). Additional resource: Nakashima, Rubis, Bates & Ávila, 2017, *Local Knowledge, Global Goals*, UNESCO.

Joint discussion session: Dr Jenny Bulstrode and Dr Noémi Tousignant.
Activity: explore and discuss (selected excerpts of) Tsing, Deger, Keleman Saxena & Zhou, (2021).

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**Week 10 (15 Dec)**

**The End of Humanity and The End of the World**
**Prof Simon Werret and Prof Brian Balmer**

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This week's session deals with total extinction: the end of humanity and the end of the world. Is there a particularly STS way to examine this topic, which has frequently caught the attention of academics such as biologists, earth scientists, literary scholars, theologians and many others?

We will look at the writer Olaf Stapledon and his account of the many human extinctions that will be coming in the next couple of billion years. We will look at his novel "Last and First Men" He proposed that there would be 18 species of humans before their final extinction 2 billion years in the future and his book is a description of those different species and their rise and fall. It's an excellent philosophical exploration of the different ways that humans might evolve and go extinct and is extremely interesting in thinking about the future of war, disease, biology, identity, science, eugenics, religion, and technology.

We will also take a step back and look at a recent attempt to think about the end of the world as a form of apocalyptic thinking that can be studied from and STS and sociology of knowledge perspective. Finally, we will take a brief look at the recent rise of studies of so-called 'existential risk' – risks that threaten to end humanity. Within STS we can ask similar questions to these scholars but also take a step back and ask 'why have such studies gained popularity now?'

Essential Reading
Stapledon, Olaf (1930), *First and Last Men*: *A Story of the Near and Far Future*
http://gutenberg.net.au/ebooks06/0601101h.html

Background Reading
Riesch, Hauke (2021), *Apocalyptic Narratives: Science, Risk and Prophecy* (Chapters 1 and 8)

Video:
*Doom and Doubt: Uncertain Futures & Open Questions about Existential Risk* (Seán Ó hÉigeartaigh, S. J. Beard, Matthijs Maas, Lalitha Sundaram, Oxford University Centre for the Study of Existential Risk, 2021) https://www.cser.ac.uk/resources/doom-and-doubt/

**Module reflections**
**Dr Carina Fearnley**

We will take a few minutes to take stock of what has been learnt in the module and address any questions you have about the topics or the assignment.