

Agenda

Normal science,
paradigms, and
scientific revolutions

1. Student discussion questions
2. The Kuhnian revolution
3. Reading discussion

Discussion question assignments

- ⋮ *Everyone should have received an email that looks like this:*

Your assignments for discussion question submission are as follows:

- Class of **2023-10-17** (*question due on Teams by 11:59pm **Monday, October 16***)
- Class of **2023-11-09** (*question due on Teams by 11:59pm **Monday, November 6***)
- Class of **2023-11-23** (*question due on Teams by 11:59pm **Monday, November 20***)

- ⋮ These list the date of the class period that your question should relate to and the due date for submitting the question.
- ⋮ E.g. the question for the class of November 9 (Poudrier 2007) is due on November 6.
- ⋮ Turn these in on the “Assignments” tab on Teams (assignment folders will be added soon)

Two-part submissions: *Example:*

1. Prompt

- ⋮ One (broad) idea, described in a few sentences
- ⋮ Can contain multiple, related “questions”
- ⋮ Can contain quotes from text
- ⋮ Should use in-text (parenthetical) citations

2. Motivation

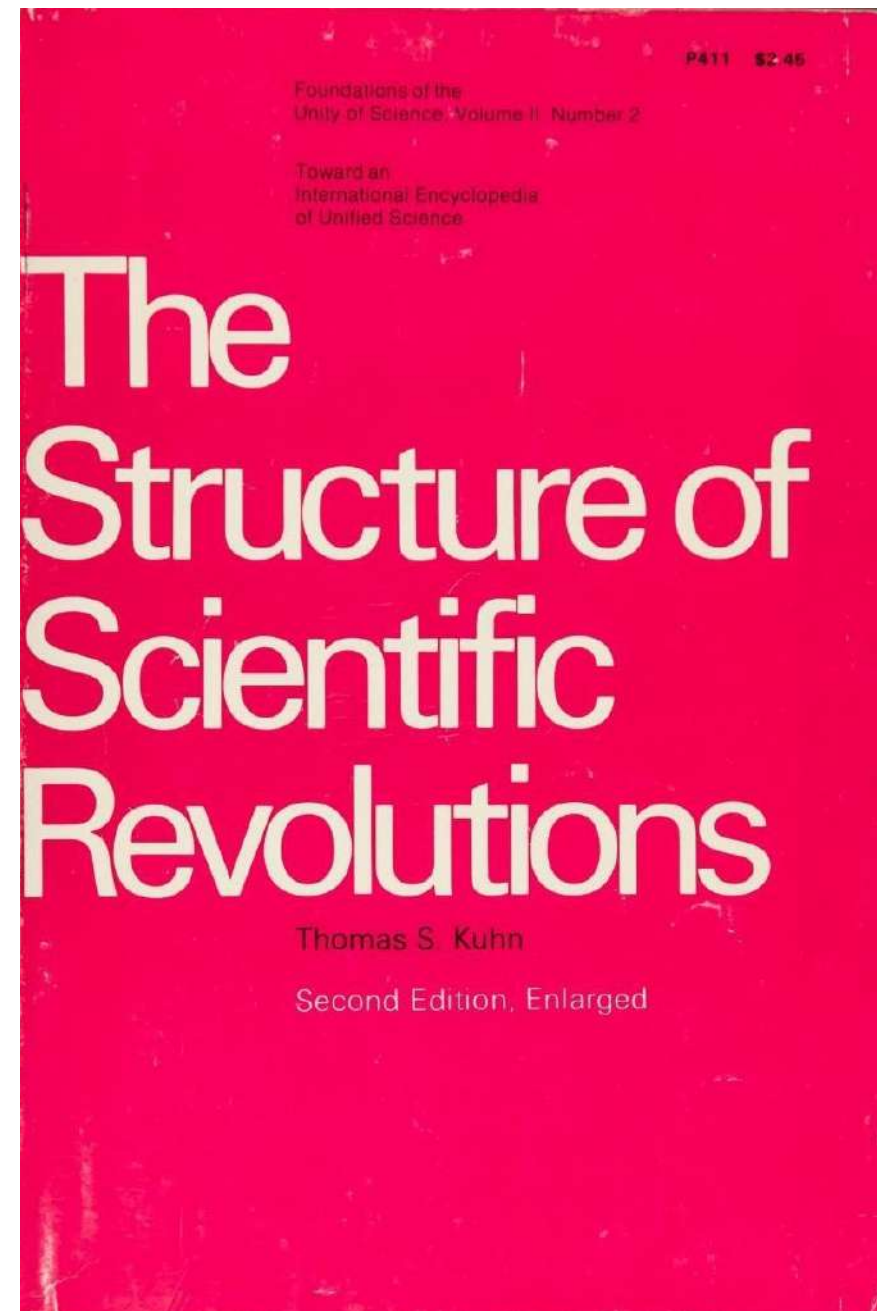
- ⋮ A few sentences describing where the question is coming from and where I hope it may lead
- ⋮ Counts toward score, but will not be published if your question is chosen for inclusion

Prompt:

Merton wrote *The normative structure of science* early in his career in 1942 (during World War II) and included it in a collection of his work on the sociology of science in 1973 (during the Cold War). How might the political climate of this time span in America have influenced his work? Do his theories cast science in a particular light? How does this work look through the lens of Wolfe’s (2018) depiction of science during the Cold War?

Motivation:

I was thinking about the age of Merton’s piece, (published more than 80 years ago!) in the context of the course theme “history of science is a social history.” Rather than just understanding the reading as an example of the sociology of science, I thought it would be interesting to treat it as the object of our inquiry. In addition to helping us understand Merton’s arguments in context, I hope this will raise the larger issue of whether we can apply the tools of the sociology of science to the sociology of science itself.



Thomas Kuhn (1922–1996)

- ⋮ Physicist by training
- ⋮ Transitioned to history and philosophy of science after PhD

The Structure of Scientific Revolutions

- ⋮ First published in 1962
- ⋮ “Normal science” vs. “paradigm shifts”
- ⋮ Directly confronted the prevailing (functionalist) view of science as an institution
- ⋮ Had a huge impact, arguably spurring its own paradigm shift in the philosophy and sociology of science

Normal science

Crisis & revolution!
(paradigm shift)

Normal science

1940s

1950s

1960s

1970s

1980s

...

2010s

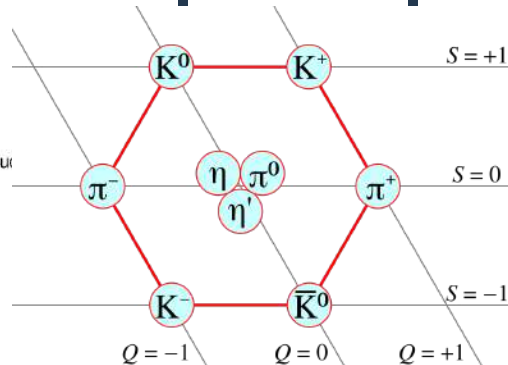
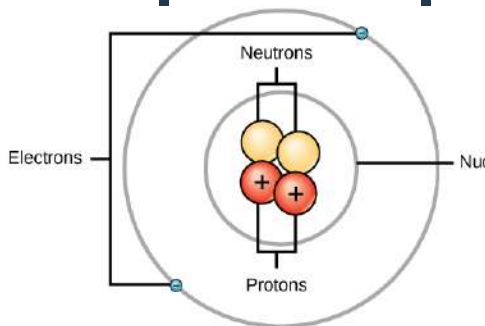
Widespread agreement on elementary particles (proton, neutron, electron, photon)

Continued discovery of more and more members of the elementary "particle zoo"

Active development of new models (e.g. "eightfold way")

Acceptance of Standard Model, explaining existing anomalies in a new theoretical framework, and predicting the existence of undiscovered particles

Experiments confirming predictions of the Standard Model, mainly through observation of predicted particles (top quark, tau neutrino, Higgs boson)



Standard Model of Elementary Particles

three generations of matter (fermions)					Interactions / force carriers (bosons)	
	I	II	III			
QUARKS	u up	c charm	t top	g gluon	H Higgs	SCALAR BOSONS
	d down	s strange	b bottom	γ photon		
	e electron	μ muon	τ tau	Z Z boson		
LEPTONS	ν_e electron neutrino	ν_μ muon neutrino	ν_τ tau neutrino	W W boson		GAUGE BOSONS VECTOR BOSONS

See Pickering (1984) "Constructing Quarks: A Sociological History of Particle Physics"



Anti-positivist

- ∴ **Positivism** is the idea that *neutral observations inform and shape objective knowledge and theories.*
- ∴ In TSSR, Kuhn suggests instead that the theoretical frameworks of a paradigm shape observations and define scientific facts.
- ∴ For Kuhn, facts do not exist without a paradigm that can give them meaning. Observation is **dependent** on theory.

Anti-falsificationist

- ∴ **Falsificationism** is the idea that *theories are disproven by counter-examples.*
- ∴ Kuhn argues that counter-examples (anomalies) do not normally cause crisis.
- ∴ Only during revolutions in paradigm are anomalies employed as justification for new worldviews.

Structural barriers to participation in science

Required reading

- ∴ **van den Brink and Benschop (2012)**
Gender practices in the construction of academic excellence: Sheep with five legs

Image credit

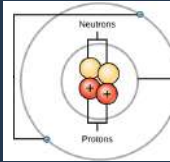


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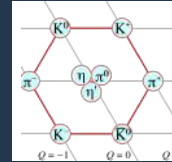


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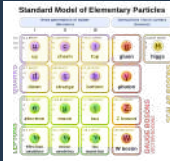


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