

Schedule of Lectures for “The Philosophy of Howard Stein”

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course website: <http://strangebeautiful.com/lmu/2018-winter-stein.html>

Winter, 2018–2019

Wed. 12:00–14:00 *C.T.*

Ludwigstr. 31, 028

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N.b.: many of the required and suggested readings are available online at the course’s website, though they may not be listed as such in the bibliography:

<http://strangebeautiful.com/lmu/2018-winter-stein.html>

Journal articles that are available through the online LMU library system do not appear there. I will be making changes to this periodically, as I decide to change some required reading, find new suggested reading I think is good, change the schedule if we fall behind, *etc.* Please check it on the website periodically, as that will always be the most up-to-date version. In particular, I will soon separate lectures 8–15 into separate listings, with readings for each.

For a complete list of all Stein’s papers, both published and unpublished, see his CV: <http://strangebeautiful.com/other-texts/stein-cv.pdf>.

Lectures 1–4: Introduction; Newton’s Methodology and Metaphysics, and His Contemporaries (17. Oct–07. Nov)

Lecture 1: Introduction (17. Oct)

Required Reading

1. Curiel (2011), “Notes on Learning Philosophy”
2. Shimony (2002a), “Introduction: The Character of Howard Stein’s Work in Philosophy and History of Physics”
3. Curiel, Friedman, Malament, and Weatherall (2018), “Nominating Letter for Howard Stein for the Hempel Prize”

Suggested Reading

1. Westfall (1983), *Never at Rest: A Biography of Isaac Newton*
2. Friedman (2018), “Nominating Letter for Howard Stein for the Hempel Prize”
3. Harper (2018), “Nominating Letter for Howard Stein for the Hempel Prize”
4. Sieg (2018), “Nominating Letter for Howard Stein for the Hempel Prize”
5. Smith (2018), “Nominating Letter for Howard Stein for the Hempel Prize”

Lecture 2: Exposition of Newton’s Theory of Light and Color (24. Oct)

Required Reading

1. [Newton \(1672b\)](#), Letter of February 6, 1671/72, to Henry Oldenburg, Secretary of the Royal Society, outlining Newton’s researches on light and color
2. [Curiel \(2018b\)](#), “Glossary for Newton’s Studies on Light and Color”

Suggested Reading

1. [Curiel \(2001\)](#), “A Plea for Modesty: Against the Current Excesses in Quantum Gravity”: §2 (a discussion of Newton’s experiments, and a comparison of the methodology of Newton and Huygens)

Lecture 3: Newton’s Methodology and Metaphysics in His Theory of Light and Color (31. Oct)

Required Reading

N.b.: READ THEM IN THE GIVEN ORDER. In particular PLEASE NOTE that the correspondence between Huygens and Newton was published in the wrong order, both in the original in the *Transactions* and in their reprinting in [Cohen 1958](#), listed here in the required reading. (The screw-up is explained in [Stein unpublished-f](#), footnote 13, p. 7.) Please make sure you read Huygens’ and Newton’s letters in the order given here, checking the pages given in the bibliography for where those letters appear in [Cohen 1958](#). Do NOT read them in the order they appear in [Cohen 1958](#).

1. [Newton \(1672b\)](#), Letter of February 6, 1671/72, to Henry Oldenburg, Secretary of the Royal Society, outlining Newton’s researches on light and color
2. [Hooke \(1672\)](#), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Hooke’s response to Newton’s investigations on light
3. [Newton \(1672c\)](#), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Newton’s response to Hooke’s criticism of Newton’s doctrine of light
4. [*** add references to the passages in the complete *Correspondence* of Newton (volume 1) about mathematical theories and doctrines that Oldenburg elided from the letters as published in the *Transactions*, in both Hooke’s and Newton’s letters ***]
5. [Huygens \(1673a\)](#), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Huygens’ first response to Newton’s investigations on light [*** explain more carefully in the references the screw-up in publication order ***]
6. [Newton \(1673a\)](#), Letter of April 3, 1673, to Henry Oldenburg, Secretary of the Royal Society, containing Newton’s response to Huygens’ first criticism of Newton’s doctrine of light [*** explain more carefully in the references the screw-up in publication order ***]
7. [Huygens \(1673b\)](#), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Huygens’ second response to Newton’s investigations on light [*** explain more carefully in the references the screw-up in publication order ***]
8. [Newton \(1673b\)](#), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Newton’s response to Huygens’ second criticism of Newton’s doctrine of light [*** explain more carefully in the references the screw-up in publication order ***]

Lectures: “The Philosophy of Howard Stein”

9. [Pardies \(1672a\)](#), “Letter of April 9, 1672, to Henry Oldenburg, Secretary of the Royal Society, Containing Pardies’ First Response to Newton’s Investigations on Light”
10. [Newton \(1672a\)](#), “Letter of April 13, 1672, to Henry Oldenburg, Secretary of the Royal Society, Containing Newton’s Response to Pardies’ First Criticism of Newton’s Doctrine of Light”
11. [Huygens \(1690\)](#), *Treatise on Light*: “Preface”
12. [Stein \(unpublished-f\)](#), “On Metaphysics and Method in Newton”: pp. 1–28 (to the end of the long quote from Newton)
13. [Stein \(unpublished-a\)](#), “Further Considerations on Newton’s Method”: pp. 1–20 (up to the paragraph beginning “The second passage. . .”)

Suggested Reading

1. [Pardies \(1672b\)](#), Letter of May 21, 1672, to Henry Oldenburg, Secretary of the Royal Society, containing Pardies’ second response to Newton’s investigations on light
2. [Newton \(1672d\)](#), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Newton’s response to Pardies’ second criticism of Newton’s doctrine of light
3. [Newton \(1730\)](#), *Opticks: Or, A Treatise of the Reflections, Refractions, Inflections and Colours of Light*: Queries 27–31 (pp. 361–406)
4. [Stein \(1993\)](#), “On Philosophy and Natural Philosophy in the Seventeenth Century”
5. [Stein \(2004b\)](#), “Newton’s Metaphysics”
6. [Stein \(unpublished-a\)](#), “Further Considerations on Newton’s Method”: the rest that is not required
7. [Stein \(unpublished-d\)](#), “Newton: Philosophy of Inquiry and Metaphysics of Nature”
8. [Stein \(unpublished-c\)](#), “Nevvtonus ab quibusdam næibus vindicatus”
9. [Curiel \(2001\)](#), “A Plea for Modesty: Against the Current Excesses in Quantum Gravity”: §2 (a discussion of Newton’s experiment, and a comparison of the methodology of Newton and Huygens)
10. Curiel (unpublished), “On Newton’s Third Rule of Reasoning in Philosophy, ‘the Universal Qualities of All Bodies Whatsoever’, and the Taxonomy of Physical Systems” [*** add proper citation, make available for download ***]
11. [Domski \(2012\)](#), “Introduction: Newton and Newtonianism”
12. [Harper and Smith \(1995\)](#), “Newton’s New Way of Inquiry”
13. [Jalobeanu \(2014\)](#), “Constructing Natural Historical Facts: Baconian Methodology in Newton’s First Paper on Light and Colors”
14. [Shapiro \(1980\)](#), “The Evolving Structure of Newton’s Theory of White Light and Color”
15. [Shapiro \(2004\)](#), “Newton’s Optics and Atomism”

Lecture 4: Stein on Newton’s Methodology and Metaphysics in His Theory of Light and Color (14. Nov)

Required Reading

1. [Stein \(unpublished-f\)](#), “On Metaphysics and Method in Newton”: pp. 1–28 (to the end of the long quote from Newton)

2. Stein (unpublished-a), “Further Considerations on Newton’s Method”: pp. 1–20 (up to the paragraph beginning “The second passage . . .”); §2.1 (pp. 26–28); §3 (pp. 29–38); §4 (pp. 39–46); pp. 52–53 (from the paragraph starting “What was the nature . . .” to the end of §5)

Suggested Reading

1. Newton (1672b), Letter of February 6, 1671/72, to Henry Oldenburg, Secretary of the Royal Society, outlining Newton’s researches on light and color
2. Hooke (1672), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Hooke’s response to Newton’s investigations on light
3. Newton (1672c), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Newton’s response to Hooke’s criticism of Newton’s doctrine of light
4. [*** add references to the passages in the complete *Correspondence* of Newton (volume 1) about mathematical theories and doctrines that Oldenburg elided from the letters as published in the *Transactions*, in both Hooke’s and Newton’s letters ***]
5. Huygens (1673a), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Huygens’ first response to Newton’s investigations on light [*** explain more carefully in the references the screw-up in publication order ***]
6. Newton (1673a), Letter of April 3, 1673, to Henry Oldenburg, Secretary of the Royal Society, containing Newton’s response to Huygens’ first criticism of Newton’s doctrine of light [*** explain more carefully in the references the screw-up in publication order ***]
7. Huygens (1673b), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Huygens’ second response to Newton’s investigations on light [*** explain more carefully in the references the screw-up in publication order ***]
8. Newton (1673b), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Newton’s response to Huygens’ second criticism of Newton’s doctrine of light [*** explain more carefully in the references the screw-up in publication order ***]
9. Pardies (1672a), “Letter of April 9, 1672, to Henry Oldenburg, Secretary of the Royal Society, Containing Pardies’ First Response to Newton’s Investigations on Light”
10. Newton (1672a), “Letter of April 13, 1672, to Henry Oldenburg, Secretary of the Royal Society, Containing Newton’s Response to Pardies’ First Criticism of Newton’s Doctrine of Light”
11. Pardies (1672b), Letter of May 21, 1672, to Henry Oldenburg, Secretary of the Royal Society, containing Pardies’ second response to Newton’s investigations on light
12. Huygens (1690), *Treatise on Light*: “Preface”
13. Newton (1672d), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Newton’s response to Pardies’ second criticism of Newton’s doctrine of light
14. Newton (1730), *Opticks: Or, A Treatise of the Reflections, Refractions, Inflections and Colours of Light*: Queries 27–31 (pp. 361–406)
15. Stein (1993), “On Philosophy and Natural Philosophy in the Seventeenth Century”
16. Stein (2004b), “Newton’s Metaphysics”
17. Stein (unpublished-a), “Further Considerations on Newton’s Method”: the rest that is not required
18. Stein (unpublished-d), “Newton: Philosophy of Inquiry and Metaphysics of Nature”

19. Stein (unpublished-c), “Nevvtonus ab quibusdam næibus vindicatus”
20. Curiel (2001), “A Plea for Modesty: Against the Current Excesses in Quantum Gravity”: §2 (a discussion of Newton’s experiment, and a comparison of the methodology of Newton and Huygens)
21. Curiel (unpublished), “On Newton’s Third Rule of Reasoning in Philosophy, ‘the Universal Qualities of All Bodies Whatsoever’, and the Taxonomy of Physical Systems” [*** add proper citation, make available for download ***]
22. Domski (2012), “Introduction: Newton and Newtonianism”
23. Jalobeanu (2014), “Constructing Natural Historical Facts: Baconian Methodology in Newton’s First Paper on Light and Colors”
24. Shapiro (1980), “The Evolving Structure of Newton’s Theory of White Light and Color”
25. Shapiro (2004), “Newton’s Optics and Atomism”

Lectures 5–7: Newtonian Space-Time (21. Nov – 05. Dec)

Lecture 5: Newtonian Space-Time I. (21. Nov)

Required Reading

1. Newton (1999b), *Philosophiæ Naturalis Principia Mathematica*: “Newton’s Preface to First Edition” (pp. 381–383; “Scholium to the Definitions” (pp. 408–415); “Axioms, or Laws of Motion” (pp. 416–417), “Corollaries IV–VI” (pp. 421–423)
2. Stein (1967), “Newtonian Space-Time”

Suggested Reading

1. Newton (unpublished), “De Gravitatione et Æquipondio Fluidorum” (translated by H. Stein)
2. Newton (1726a, 1726b), *Philosophiæ Naturalis Principia Mathematica*: “System of the World (in Mathematical Treatment)” (p. 397); “Rules of Reasoning in Philosophy” (p. 398–400); “Phænomena” (pp. 401–405); “Propositions” I–XII (pp. 406–420)
3. Stein (1970a), “On the Notion of Field in Newton, Maxwell and Beyond”: pp. 264–279 (to the end of §I)
4. Stein (1977b), “Some Philosophical Prehistory of General Relativity”
5. Stein (1990a), “‘From the Phænomena of Motions to the Forces of Nature’: Hypothesis or Deduction?”
6. Stein (1977a), “On Space-Time and Ontology: Extract from a Letter to Adolf Grünbaum”
7. Stein (1990b), “On Locke, ‘the Great Huygenius, and the Incomparable Mr. Newton’”
8. Stein (2004b), “Newton’s Metaphysics”
9. Stein (unpublished-f), “On Metaphysics and Method in Newton”: pp. 28–end (starting right after the long quote from Newton)
10. Stein (unpublished-a), “Further Considerations on Newton’s Method”: pp. 20–26 (starting at the paragraph beginning “The second passage. . .”, up to the end of §2, *i.e.*, up to the start of §2.1)
11. Biener and Smeenk (2013), “Cotes’ Queries: Newton’s Empiricism and Conceptions of Matter”

12. [Brading \(2013\)](#), “Newton’s Law-Constitutive Approach to Bodies: A Response to Descartes”
13. [Cohen \(2004\)](#), “Newton’s Concepts of Force and Mass, with Notes on the Laws of Motion”
14. Curiel (unpublished), “On Newton’s Third Rule of Reasoning in Philosophy, ‘the Universal Qualities of All Bodies Whatsoever’, and the Taxonomy of Physical Systems” [*** add proper citation, make available for download ***]
15. [DiSalle \(1994\)](#), “On Dynamics, Indiscernibility, and Spacetime Ontology”
16. [DiSalle \(1995\)](#), “Spacetime Theory as Physical Geometry”
17. [Disalle \(2004\)](#), “Newton’s Philosophical Analysis of Space and Time”
18. [DiSalle \(2006\)](#), *Understanding Space-Time: The Philosophical Development of Physics from Newton to Einstein*: chs. 1–2
19. [Domski \(2010\)](#), “Newton’s Empiricism and Metaphysics”
20. [Downing \(2014\)](#), “Locke’s Metaphysics and Newtonian Metaphysics”
21. [Earman \(1989\)](#), *World Enough and Space-Time: Absolute versus Relational Theories of Space and Time*: chs. 1–4, 6
22. [Friedman \(1983\)](#), *Foundations of Space-Time Theories: Relativistic Physics and Philosophy of Science*: ch. II; ch. III, §§1–2, 6–8
23. [Garber \(2013\)](#), “Leibniz, Newton and Force”
24. [Geroch \(1981\)](#), *General Relativity from A to B*: ch. 3
25. [Grünbaum \(1977\)](#), “Absolute and Relational Theories of Space and Space-Time”
26. [Harper \(1995\)](#), “Kant, Riemann and Reichenbach on Space and Geometry”
27. [Harper \(2002\)](#), “Howard Stein on Isaac Newton: Beyond Hypotheses?”
28. [Huygens \(1995\)](#), “On the Motion of Bodies Resulting from Impact”: Hypotheses and Propositions I–VI (pp. 1–6)
29. [Janiak \(2006\)](#), *Newton as Philosopher* (especially ch. 2, but the rest is relevant as well)
30. [Knox \(2013\)](#), “Effective Spacetime Geometry”
31. [Knox \(2014\)](#), “Newtonian Spacetime Structure in Light of the Equivalence Principle”
32. [Knox \(2017\)](#), “Physical Relativity from a Functionalist Perspective”
33. [Leibniz and Clarke \(1956\)](#), *The Leibniz-Clarke Correspondence*: Preface; Introduction; Advertisement to the Reader; Leibniz’s Second Paper through Clarke’s Fifth Reply, pp. 15–121
34. [Mach \(1960\)](#), *Space and Geometry*
35. [Maxwell \(1877\)](#), *Matter and Motion*: chs. I–III; VI, articles 98–105
36. [McGuire \(1967\)](#), “Transmutation and Immutability: Newton’s Doctrine of Physical Qualities”
37. [McGuire \(1968\)](#), “Force, Active Principles, and Newton’s Invisible Realm”
38. [McMullin \(1978\)](#), *Newton on Matter and Activity*
39. [Meli \(2004\)](#), “Newton and the Leibniz-Clarke Correspondence”
40. [Reichenbach \(1958\)](#), *The Philosophy of Space and Time*: ch. III, §§34–36
41. [Rynasiewicz \(1995a\)](#), “By Their Properties, Causes and Effects: Newton’s Scholium on Time, Space, Place and Motion — I. The Text”
42. [Rynasiewicz \(1995b\)](#), “By Their Properties, Causes and Effects: Newton’s Scholium on Time, Space, Place and Motion — II. The Context”
43. [Saunders \(2013\)](#), “Rethinking Newton’s Principia”
44. [Schliesser \(2011\)](#), “Newton’s Challenge to Philosophy: A Programmatic Essay”
45. [Sklar \(1976\)](#), *Space, Time and Spacetime*: ch. III, §A & §B.1
46. [Sklar \(2002\)](#), “Physics, Metaphysics, and Method in Newton’s Dynamics”

47. [Smith \(2004\)](#), “The Methodology of the *Principia*”
48. [Torretti \(1984\)](#), *Relativity and Geometry*: ch. 1
49. [Westfall \(1971\)](#), *Force in Newton’s Physics: The Science of Dynamics in the Seventeenth Century*
50. [Weatherall \(2016\)](#), “Maxwell-Huygens, Newton-Cartan, and Saunders-Knox Space-Times”
51. [Weatherall \(2017\)](#), “Inertial Motion, Explanation, and the Foundations of Classical Spacetime Theories”

German Editions

1. [Hutter \(1989\)](#), *Die Andänge der Mechanik: Newtons Principia gedeutet aus ihrer Zeit und ihrer Wirkung auf die Physik*
2. [Huygens \(1903\)](#), *Nachgelassene Abhandlungen: Über die Bewegung der Körper durch den Stoss. Über die Centrifugalkraft.*
3. [Maxwell \(1881\)](#), *Substanz und Bewegung*
4. [Newton \(1872\)](#), *Sir Isaac Newtons mathematische Principien der Naturlehre*
5. [Newton \(1999a\)](#), *Die mathematischen Prinzipien der Physik: Philosophiae Naturalis Principia Mathematica*
6. [Newton \(2014\)](#), *Mathematische Grundlagen der Naturphilosophie: Philosophiæ Naturalis Principia Mathematica*
7. [Schneider \(1988\)](#), *Isaac Newton*
8. [Newton \(1988\)](#), *Über die Gravitation...*
9. [Steinle \(1991\)](#), *Newton’s Entwurf “Über die Gravitation...”: Ein Stück Entwicklungsgeschichte seiner Mechanik*
10. [Westfall \(1996\)](#), *Isaac Newton – Eine Biographie*

Lecture 6: NO CLASS, DR. CURIEL OUT OF TOWN (28. Nov)

Lecture 7: Newtonian Space-Time II. (05. Dec)

Required Reading

1. [Newton \(1999b\)](#), *Philosophiæ Naturalis Principia Mathematica*: “Newton’s Preface to First Edition” (pp. 381–383; “Scholium to the Definitions” (pp. 408–415); “Axioms, or Laws of Motion” (pp. 416–417), “Corollaries IV–VI” (pp. 421–423)
2. [Stein \(1967\)](#), “Newtonian Space-Time”

Suggested Reading

1. [Newton \(unpublished\)](#), “De Gravitatione et Æquipondio Fluidorum” (translated by H. Stein)
2. [Newton \(1726a, 1726b\)](#), *Philosophiæ Naturalis Principia Mathematica*: “System of the World (in Mathematical Treatment)” (p. 397); “Rules of Reasoning in Philosophy” (p. 398–400); “Phænomena” (pp. 401–405); “Propositions” I–XII (pp. 406–420)
3. [Stein \(1970a\)](#), “On the Notion of Field in Newton, Maxwell and Beyond”: pp. 264–279 (to the end of §I)
4. [Stein \(1977a\)](#), “On Space-Time and Ontology: Extract from a Letter to Adolf Grünbaum”
5. [Stein \(1977b\)](#), “Some Philosophical Prehistory of General Relativity”

6. Stein (1990a), “‘From the Phænomena of Motions to the Forces of Nature’: Hypothesis or Deduction?”
7. Stein (1990b), “On Locke, ‘the Great Huygenius, and the Incomparable Mr. Newton’”
8. Stein (2004b), “Newton’s Metaphysics”
9. Stein (unpublished-f), “On Metaphysics and Method in Newton”: pp. 28-end (starting right after the long quote from Newton)
10. Stein (unpublished-a), “Further Considerations on Newton’s Method”: pp. 20–26 (starting at the paragraph beginning “The second passage. . .”, up to the end of §2, *i.e.*, up to the start of §2.1)
11. Biener and Smeenk (2013), “Cotes’ Queries: Newton’s Empiricism and Conceptions of Matter”
12. Brading (2013), “Newton’s Law-Constitutive Approach to Bodies: A Response to Descartes”
13. Cohen (2004), “Newton’s Concepts of Force and Mass, with Notes on the Laws of Motion”
14. Curiel (unpublished), “On Newton’s Third Rule of Reasoning in Philosophy, ‘the Universal Qualities of All Bodies Whatsoever’, and the Taxonomy of Physical Systems” [*** add proper citation, make available for download ***]
15. DiSalle (1994), “On Dynamics, Indiscernibility, and Spacetime Ontology”
16. DiSalle (1995), “Spacetime Theory as Physical Geometry”
17. Disalle (2004), “Newton’s Philosophical Analysis of Space and Time”
18. DiSalle (2006), *Understanding Space-Time: The Philosophical Development of Physics from Newton to Einstein*: chs. 1–2
19. Domski (2010), “Newton’s Empiricism and Metaphysics”
20. Downing (2014), “Locke’s Metaphysics and Newtonian Metaphysics”
21. Earman (1989), *World Enough and Space-Time: Absolute versus Relational Theories of Space and Time*: chs. 1–4, 6
22. Friedman (1983), *Foundations of Space-Time Theories: Relativistic Physics and Philosophy of Science*: ch. II; ch. III, §§1–2, 6–8
23. Garber (2013), “Leibniz, Newton and Force”
24. Geroch (1981), *General Relativity from A to B*: ch. 3
25. Grünbaum (1977), “Absolute and Relational Theories of Space and Space-Time”
26. Harper (1995), “Kant, Riemann and Reichenbach on Space and Geometry”
27. Harper (2002), “Howard Stein on Isaac Newton: Beyond Hypotheses?”
28. Huygens (1995), “On the Motion of Bodies Resulting from Impact”: Hypotheses and Propositions I–VI (pp. 1–6)
29. Janiak (2006), *Newton as Philosopher* (especially ch. 2, but the rest is relevant as well)
30. Knox (2013), “Effective Spacetime Geometry”
31. Knox (2014), “Newtonian Spacetime Structure in Light of the Equivalence Principle”
32. Knox (2017), “Physical Relativity from a Functionalist Perspective”
33. Leibniz and Clarke (1956), *The Leibniz-Clarke Correspondence*: Preface; Introduction; Advertisement to the Reader; Leibniz’s Second Paper through Clarke’s Fifth Reply, pp. 15–121
34. Mach (1960), *Space and Geometry*
35. Maxwell (1877), *Matter and Motion*: chs. I–III; VI, articles 98–105
36. McGuire (1967), “Transmutation and Immutability: Newton’s Doctrine of Physical Qualities”
37. McGuire (1968), “Force, Active Principles, and Newton’s Invisible Realm”

38. McMullin (1978), *Newton on Matter and Activity*
39. Meli (2004), “Newton and the Leibniz-Clarke Correspondence”
40. Reichenbach (1958), *The Philosophy of Space and Time*: ch. III, §§34–36
41. Rynasiewicz (1995a), “By Their Properties, Causes and Effects: Newton’s Scholium on Time, Space, Place and Motion — I. The Text”
42. Rynasiewicz (1995b), “By Their Properties, Causes and Effects: Newton’s Scholium on Time, Space, Place and Motion — II. The Context”
43. Saunders (2013), “Rethinking Newton’s Principia”
44. Schliesser (2011), “Newton’s Challenge to Philosophy: A Programmatic Essay”
45. Sklar (1976), *Space, Time and Spacetime*: ch. III, §A & §B.1
46. Sklar (2002), “Physics, Metaphysics, and Method in Newton’s Dynamics”
47. Smith (2004), “The Methodology of the *Principia*”
48. Torretti (1984), *Relativity and Geometry*: ch. 1
49. Westfall (1971), *Force in Newton’s Physics: The Science of Dynamics in the Seventeenth Century*
50. Weatherall (2016), “Maxwell-Huygens, Newton-Cartan, and Saunders-Knox Space-Times”
51. Weatherall (2017), “Inertial Motion, Explanation, and the Foundations of Classical Spacetime Theories”

German Editions

1. Hutter (1989), *Die Andänge der Mechanik: Newtons Principia gedeutet aus ihrer Zeit und ihrer Wirkung auf die Physik*
2. Huygens (1903), *Nachgelassene Abhandlungen: Über die Bewegung der Körper durch den Stoss. Über die Centrifugalkraft.*
3. Maxwell (1881), *Substanz und Bewegung*
4. Newton (1872), *Sir Isaac Newtons mathematische Principien der Naturlehre*
5. Newton (1999a), *Die mathematischen Prinzipien der Physik: Philosophiae Naturalis Principia Mathematica*
6. Newton (2014), *Mathematische Grundlagen der Naturphilosophie: Philosophiæ Naturalis Principia Mathematica*
7. Schneider (1988), *Isaac Newton*
8. Newton (1988), *Über die Gravitation...*
9. Steinle (1991), *Newton’s Entwurf “Über die Gravitation...”: Ein Stück Entwicklungsgeschichte seiner Mechanik*
10. Westfall (1996), *Isaac Newton – Eine Biographie*

Lectures 8–10: Methodology, Epistemology, and the Structure of Our Knowledge in Physics (07. Dec 2018 – 19. Dec)

Lecture 8: Stein on Carnap and Quine (07. Dec)

Required Reading

1. Stein (1992), “Was Carnap Entirely Wrong, After All?”

STRONGLY Suggested Reading

1. Carnap (1956a), “Empiricism, Semantics and Ontology”
2. Quine (1960), “Carnap and Logical Truth”
3. Quine (1980), “Two Dogmas of Empiricism”

Suggested Reading

1. Blackburn (2009), “The Steps from Doing to Saying”
2. Carus (2017), “Carnapian Rationality”
3. Carnap (1936), “Testability and Meaning”
4. Carnap (1959), *The Logical Syntax of Language*: Part v
5. Carnap (1942), *Introduction to Semantics*: *passim*
6. Carnap (1956b), “The Methodological Character of Theoretical Concepts”: §§I–VI (pp. 38–52)
7. Carnap (1966), *An Introduction to the Philosophy of Science: Philosophical Foundations of Physics*: part v, chs. 23–26 (pp. 225–256)
8. Curiel (2017a), “On the Propriety of Physical Theories as a Basis for Their Semantics”
9. Curiel (2017b), “Schematizing the Observer and the Epistemic Content of Theories or Getting the Theory into the Laboratory”
10. Demopoulos (2013d), “On the Rational Reconstruction of Our Theoretical Knowledge”
11. Demopoulos (2013e), “Three Views of Theoretical Knowledge”
12. Friedman (2001), *The Dynamics of Reason*: Part One (pp. 3–70); Part Two, §§1–2 (pp. 71–92)
13. Friedman (2011), “Carnap on Theoretical Terms: Structuralism without Metaphysics”
14. Friedman (2018), “Nominating Letter for Howard Stein for the Hempel Prize”
15. Kuhn (1996), *The Structure of Scientific Revolutions*
16. Kuhn (1990), “The Road since Structure”
17. Lakatos (1970), “Falsification and the Methodology of Scientific Research Programmes”
18. Putnam (1979), “What Theories Are Not”
19. Quine (1951), “On Carnap’s Views on Ontology”
20. Quine (1969), *Ontological Relativity and Other Essays*
21. Shimony (2002b), “Some Intellectual Obligations of Epistemological Naturalism”

Lecture 9: The Structure of Our Knowledge in Physics (12. Dec)

Required Reading

1. Stein (1994b), “Some Reflections on the Structure of Our Knowledge in Physics”

Suggested Reading

1. Stein (1992), “Was Carnap Entirely Wrong, After All?”
2. Stein (1990b), “On Locke, ‘the Great Huygenius, and the Incomparable Mr. Newton’”
3. Stein (1970a), “On the Notion of Field in Newton, Maxwell and Beyond”: §III (pp. 285–287)
4. Carus (2017), “Carnapian Rationality”
5. Carnap (1936), “Testability and Meaning”
6. Carnap (1959), *The Logical Syntax of Language*: Part v

Lectures: “The Philosophy of Howard Stein”

7. Carnap (1956a), “Empiricism, Semantics and Ontology”
8. Carnap (1956b), “The Methodological Character of Theoretical Concepts”: §§I–VI (pp. 38–52)
9. Carnap (1966), *An Introduction to the Philosophy of Science: Philosophical Foundations of Physics*: part v, chs. 23–26 (pp. 225–256)
10. Curiel (2018a), “Framework Confirmation by Newtonian Abduction”
11. Curiel (2017a), “On the Propriety of Physical Theories as a Basis for Their Semantics”
12. Curiel (2017b), “Schematizing the Observer and the Epistemic Content of Theories or Getting the Theory into the Laboratory”
13. Demopoulos (2013d), “On the Rational Reconstruction of Our Theoretical Knowledge”
14. Demopoulos (2013e), “Three Views of Theoretical Knowledge”
15. Friedman (2001), *The Dynamics of Reason*: Part One (pp. 3–70); Part Two, §§1–2 (pp. 71–92)
16. Friedman (2011), “Carnap on Theoretical Terms: Structuralism without Metaphysics”
17. Friedman (2018), “Nominating Letter for Howard Stein for the Hempel Prize”
18. Kuhn (1996), *The Structure of Scientific Revolutions*
19. Kuhn (1990), “The Road since Structure”
20. Lakatos (1970), “Falsification and the Methodology of Scientific Research Programmes”
21. Putnam (1979), “What Theories Are Not”
22. Quine (1980), “Two Dogmas of Empiricism”
23. Quine (1960), “Carnap and Logical Truth”
24. Shimony (2002b), “Some Intellectual Obligations of Epistemological Naturalism”

Lecture 10: Knowledge and Understanding (09. Jan 2019)

Required Reading

1. Stein (2004a), “The Enterprise of Understanding and the Enterprise of Knowledge—for Isaac Levi’s Seventieth Birthday”

STRONGLY Suggested Reading

1. [*** add proper bibliographic references ***] John McDowell, *Mind, Value, and Reality*, Harvard University Press, Cambridge, MA (1998), Essays 6 through 8: ‘Aesthetic Value, Objectivity, and the Fabric of the World’, pp. 112–130; ‘Values and Secondary Qualities’, pp. 131–150; ‘Projection and Truth in Ethics’, pp. 151–166.

Suggested Reading

1. Stein (1993), “On Philosophy and Natural Philosophy in the Seventeenth Century”
2. Stein (1990b), “On Locke, ‘the Great Huygenius, and the Incomparable Mr. Newton’”
3. Downing (2014), “Locke’s Metaphysics and Newtonian Metaphysics”
4. Hume (1978), *A Treatise of Human Nature*: Book I, Part I, §1
5. [*** add proper bibliographic references ***] Grassmann, Helmholtz, Maxwell
6. [*** add proper bibliographic reference ***] Levi, *The Enterprise of Knowledge*
7. Locke (1979): *passim*
8. [*** add proper bibliographic references ***] McDowell, *Mind and World*, Harvard University Press, Cambridge, MA (1998): *passim*
9. Newton (1672b), “Letter of February 6, 1671/72, to Henry Oldenburg, Secretary of the Royal Society, Outlining Newton’s Researches on Light and Color”

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Lectures 11–13: Physics and Metaphysics (16. Jan – 30. Jan 2019)

Lecture 11: Realism and Anti-Realism (16. Jan 2019)

Required Reading

1. Stein (1989), “Yes, but...: Some Skeptical Remarks on Realism and Anti-Realism”

Suggested

1. Stein (1970a), “On the Notion of Field in Newton, Maxwell and Beyond”: pp. 264–272 (end of §I.2)
2. Stein (1970b), “Replies to Comments by G. Buchdahl and M. Hesse on “On the Notion of Field in Newton, Maxwell and Beyond””
3. Stein (1981), “‘Subtler Forms of Matter’ in the Period Following Maxwell”
4. Stein (1979), “On Newton and Einstein”
5. Stein (1993), “On Philosophy and Natural Philosophy in the Seventeenth Century”
6. Stein (1990b), “On Locke, ‘the Great Huygenius, and the Incomparable Mr. Newton””
7. Boyd (1991), “On the Current State of Scientific Realism”
8. Buchdahl (1970), “Comment on “On the Notion of Field in Newton, Maxwell and Beyond” by Howard Stein”
9. Carnap (1956a), “Empiricism, Semantics and Ontology”
10. Curiel (2001), “A Plea for Modesty: Against the Current Excesses in Quantum Gravity”
11. Curiel (unpublished), “On Newton’s Third Rule of Reasoning in Philosophy, ‘the Universal Qualities of All Bodies Whatsoever’, and the Taxonomy of Physical Systems” [*** add proper citation, make available for download ***]
12. Curiel (2009), “General Relativity Needs No Interpretation”
13. Curiel (2016), “On the Existence of Spacetime Structure”
14. Demopoulos (2013c), “On Extending ‘Empiricism, Semantics and Ontology’ to the Realism-Instrumentalism Controversy”
15. Demopoulos (2013a), “Carnap’s Analysis of Realism”
16. van Fraassen (1980), *The Scientific Image*, chs. 2–4
17. van Fraassen (2008), *Scientific Representation*: ch. 3; chs. 6–7, pp. 141–190; chs. 12–13, pp. 269–308
18. Hesse (1970), “Comment on “On the Notion of Field in Newton, Maxwell and Beyond” by Howard Stein”
19. Nersessian (2002), “Maxwell and the ‘Method of Physical Analogy’: Model-Based Reasoning, Generic Abstraction and Conceptual Change”

20. Putnam (1983a), “Models and Reality”
21. Putnam (1983c), “Reference and Truth”
22. Putnam (1983d), “Why There Isn’t a Ready-Made World”
23. Quine (1951), “On Carnap’s Views on Ontology”
24. Worrall (1989), “Structural Realism: The Best of Both Worlds?”

Lecture 12: Physics and Metaphysics (30. Jan 2019)

Required Reading

1. Stein (unpublished-b), “How Does Physics Bear Upon Metaphysics; and Why Did Plato Hold that Philosophy Cannot Be Written Down?”

Suggested

1. Stein (1990b), “On Locke, ‘the Great Huygenius, and the Incomparable Mr. Newton’”
2. Stein (1977b), “Some Philosophical Prehistory of General Relativity”
3. Stein (1977a), “On Space-Time Ontology: Extracts of a Letter to Adolf Grünbaum”
4. Stein (2004b), “Newton’s Metaphysics”
5. Stein (unpublished-e), “Newton: Philosophy of Inquiry and Metaphysics of Nature”
6. Stein (1970a), “On the Notion of Field in Newton, Maxwell and Beyond”: pp. 264–272 (end of §I.2)
7. Stein (1970b), “Replies to Comments by G. Buchdahl and M. Hesse on “On the Notion of Field in Newton, Maxwell and Beyond””
8. Stein (1981), “‘Subtler Forms of Matter’ in the Period Following Maxwell”
9. Buchdahl (1970), “Comment on “On the Notion of Field in Newton, Maxwell and Beyond” by Howard Stein”
10. Curiel (2016), “On the Existence of Spacetime Structure”
11. Einstein (1982), “Maxwell’s Influence on the Development of the Conception of Physical Reality”
12. Hesse (1970), “Comment on “On the Notion of Field in Newton, Maxwell and Beyond” by Howard Stein”
13. Maxwell (1856), “On Faraday’s Lines of Force”
14. Maxwell (1864), “A Dynamical Theory of the Electromagnetic Field”
15. Nersessian (2002), “Maxwell and the ‘Method of Physical Analogy’: Model-Based Reasoning, Generic Abstraction and Conceptual Change”
16. Putnam (1983a), “Models and Reality”
17. Putnam (1983c), “Reference and Truth”
18. Putnam (1983d), “Why There Isn’t a Ready-Made World”
19. Worrall (1989), “Structural Realism: The Best of Both Worlds?”

Lecture 14: NO CLASS, DR. CURIEL OUT OF TOWN (06. Feb 2019)

FINAL PAPER DUE: 25. MARCH 2019

FINAL COURSE GRADES SUBMITTED: 15. APRIL 2019

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