

# Schedule of Lectures for “The Philosophy of Howard Stein”

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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>

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.

For a complete list of all Stein’s papers, both published and unpublished, see his CV: 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; Newton’s Theory of Light and Color (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”
4. Newton (1672a), Letter of February 6, 1671/72, to Henry Oldenburg, Secretary of the Royal Society, outlining Newton’s researches on light and color

#### Suggested Reading

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

## Lecture 2: Newton’s Methodology and Metaphysics in His Theory of Light and Color (24. Oct)

Required Reading (*N.b.*: READ THEM IN THE GIVEN ORDER)

1. [Newton \(1672a\)](#), 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 \(1672b\)](#), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Newton’s response to Hooke’s criticism of Newton’s doctrine of light
4. [Huygens \(1673a\)](#), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Huygens’ first response to Newton’s investigations on light
5. [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
6. [Huygens \(1673b\)](#), Letter to Henry Oldenburg, Secretary of the Royal Society, containing Huygens’ second response to Newton’s investigations on light
7. [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
8. [Stein \(shedf\)](#), “On Metaphysics and Method in Newton”

Suggested Reading

1. [Pardies \(1672\)](#), 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 \(1672c\)](#), 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 \(sheda\)](#), “Further Considerations on Newton’s Method”
7. [Stein \(shedd\)](#), “Newton: Philosophy of Inquiry and Metaphysics of Nature”
8. [Stein \(shede\)](#), “Nevvtonus ab quibusdam næibus vindicatus”
9. [Huygens \(1690\)](#), *Treatise on Light*: “Preface”
10. [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)
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. [Domski \(2012\)](#), “Introduction: Newton and Newtonianism”
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 3: Newton’s Metaphysics about Kinematics, Dynamics, Space and Time (31. Oct)

#### Required Reading

1. [Newton \(shed\)](#), “De Gravitatione et Æquipondio Fluidorum” (translated by H. Stein)
2. [Newton \(1726\)](#), *Philosophiæ Naturalis Principia Mathematica*: “Definitions”, “Scholium to the Definitions”, “Axioms, or Laws of Motion”, “Corollaries”, “Scholium to the Laws” (pp. 1–28)
3. [Stein \(1970b\)](#), “On the Notion of Field in Newton, Maxwell and Beyond”: pp. 264–279 (to the end of §I)
4. [Stein \(2004b\)](#), “Newton’s Metaphysics”

#### Suggested Reading

1. [Stein \(1990c\)](#), “On Locke, ‘the Great Huygenius, and the Incomparable Mr. Newton’”
2. [Biener and Smeenk \(2013\)](#), “Cotes’ Queries: Newton’s Empiricism and Conceptions of Matter”
3. [Brading \(2013\)](#), “Newton’s Law-Constitutive Approach to Bodies: A Response to Descartes”
4. 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 \*\*\*]
5. [DiSalle \(1994\)](#), “On Dynamics, Indiscernibility, and Spacetime Ontology”
6. [DiSalle \(1995\)](#), “Spacetime Theory as Physical Geometry”
7. [DiSalle \(2006b\)](#), *Understanding Space-Time: The Philosophical Development of Physics from Newton to Einstein*: chs. 1–2
8. [Disalle \(2004\)](#), “Newton’s Philosophical Analysis of Space and Time”
9. [Domski \(2010\)](#), “Newton’s Empiricism and Metaphysics”
10. [Downing \(2014\)](#), “Locke’s Metaphysics and Newtonian Metaphysics”
11. [Earman \(1989\)](#), *World Enough and Space-Time: Absolute versus Relational Theories of Space and Time*: chs. 2–3; ch. 4, §1
12. [Friedman \(1983\)](#), *Foundations of Space-Time Theories: Relativistic Physics and Philosophy of Science*: ch. II; ch. II, §§1–2, 6–8
13. [Garber \(2013\)](#), “Leibniz, Newton and Force”
14. [Huygens \(1995\)](#), “On the Motion of Bodies Resulting from Impact”: Hypotheses; Propositions I–VI, pp. 1–6
15. [Janiak \(2006\)](#), *Newton as Philosopher* (especially ch. 2, but the rest is relevant as well)
16. [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
17. [Maxwell \(1877\)](#), *Matter and Motion*: chs. I–III; VI, articles 98–105
18. [McGuire \(1967\)](#), “Transmutation and Immutability: Newton’s Doctrine of Physical Qualities”
19. [McGuire \(1968\)](#), “Force, Active Principles, and Newton’s Invisible Realm”
20. [McMullin \(1978\)](#), *Newton on Matter and Activity*
21. [Meli \(2004\)](#), “Newton and the Leibniz-Clarke Correspondence”
22. [Rynasiewicz \(1995a\)](#), “By Their Properties, Causes and Effects: Newton’s Scholium on Time, Space, Place and Motion — I. The Text”

23. [Rynasiewicz \(1995b\)](#), “By Their Properties, Causes and Effects: Newton’s Scholium on Time, Space, Place and Motion — II. The Context”
24. [Sklar \(1976\)](#), *Space, Time and Spacetime*: ch. III, §A & §B.1
25. [Sklar \(2002\)](#), “Physics, Metaphysics, and Method in Newton’s Dynamics”
26. [Westfall \(1971\)](#), *Force in Newton’s Physics: The Science of Dynamics in the Seventeenth Century*

### 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 \(1999\)](#), *Die mathematischen Prinzipien der Physik: Philosophiæ 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. [Torretti \(1984\)](#), *Relativity and Geometry*: ch. 1
11. [Westfall \(1996\)](#), *Isaac Newton – Eine Biographie*

### Lecture 4: Newton’s Methodology in His Theory of Gravity (07. Nov)

#### Required Reading

1. [Newton \(1726\)](#), [Newton \(1726\)](#), *Philosophiæ Naturalis Principia Mathematica*: “Newton’s Preface to the First Edition” (Book I, pp. xvii–xviii); “System of the World (in Mathematical Treatment)” (p. 397); “Rules of Reasoning in Philosophy” (p. 398–400); “Phenomena” (pp. 401–405); “Propositions” (Propositions I–XII, pp. 406–420)
2. [Stein \(1990a\)](#), “‘From the Phænomena of Motions to the Forces of Nature’: Hypothesis or Deduction?”

#### Suggested Reading

1. [Biener \(2017\)](#), “Newton’s *Regulæ Philosophandi*”
2. [Biener and Schliesser \(2017\)](#), “The Certainty, Modality, and Grounding of Newton’s Laws”
3. [Cohen \(1982\)](#), “The *Principia*, Universal Gravitation, and the ‘Newtonian Style’, in Relation to the Newtonian Revolution in Science: Notes on the Occasion of the 250th Anniversary of Newton’s Death”
4. [Cohen \(2004\)](#), “Newton’s Concepts of Force and Mass, with Notes on the Laws of Motion”
5. [Curiel \(2018\)](#), “Framework Confirmation by Newtonian Abduction”

6. Harper (1999), “The First Six Propositions in Newton’s Argument for Universal Gravity”
7. Harper (2002), “Howard Stein on Isaac Newton: Beyond Hypotheses?”
8. Harper (2011), *Isaac Newton’s Scientific Method: Turning Data into Evidence about Gravity and Cosmology*
9. Harper (2004), “Newton’s Argument for Universal Gravitation”
10. Harper and Smith (1995), “Newton’s Newt Way of Inquiry”
11. Janiak (2006), *Newton as Philosopher* (especially ch. 2, but the rest is relevant as well)
12. Schliesser (2011), “Newton’s Challenge to Philosophy: A Programmatic Essay”
13. Sklar (2002), “Physics, Metaphysics, and Method in Newton’s Dynamics”
14. Smith (2002), “From the Phenomenon of the Ellipse to an Inverse-Square Force: Why Not?”
15. Smith (2004), “The Methodology of the *Principia*”
16. Smith (2014), “Closing the Loop: Testing Newtonian Gravity Then and Now”
17. Walsh (2014), “Phenomena in Newton’s *Principia*”

## Lectures 5–8: Space, Time, and Spacetime (14. Nov–05 Dec)

### Lecture 5: Newtonian Space-Time (14. Nov)

#### Required Reading

1. Stein (1967), “Newtonian Space-Time”

#### Suggested Reading

1. Newton (1726), *Philosophiæ Naturalis Principia Mathematica*: “Scholium to the Definitions” (pp. 6–12)
2. DiSalle (1994), “On Dynamics, Indiscernibility, and Spacetime Ontology”
3. DiSalle (1995), “Spacetime Theory as Physical Geometry”
4. DiSalle (2006b), *Understanding Space-Time: The Philosophical Development of Physics from Newton to Einstein*: chs. 1–2, 5
5. Earman (1989), *World Enough and Space-Time: Absolute versus Relational Theories of Space and Time*: chs. 1–4, 6
6. Friedman (1983), *Foundations of Space-Time Theories: Relativistic Physics and Philosophy of Science*: ch. II; ch. III, §§1–2, 6–8
7. Geroch (1981), *General Relativity from A to B*: ch. 3
8. Huygens (1995), “On the Motion of Bodies Resulting from Impact”: Hypotheses; Propositions I–VI, pp. 1–6
9. 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

### German Editions

1. Huygens (1903), *Nachgelassene Abhandlungen: Über die Bewegung der Körper durch den Stoss. Über die Centrifugalkraft.*

## Lecture 6: Special Relativity (21. Nov)

### Required Reading

1. Stein (1991), “On Relativity Theory and Openness of the Future”

### Suggested Reading

1. Stein (1968), “On Einstein-Minkowski Space-Time”
2. Stein (1970a), “A Note on Time and Relativity Theory”
3. Stein (2009), “‘Definability,’ ‘Conventionality,’ and Simultaneity in Einstein-Minkowski Space-Time”
4. Belot (2013), “Time in Classical and Relativistic Physics”
5. Ben-Yami (2015), “Causal Order, Temporal Order, and Becoming in Special Relativity”
6. Brown (2005), *Physical Relativity: Space-Time Structure from a Dynamical Perspective*: chs. 1–8
7. Clifton and Hogarth (1995), “The Definability of Objective Becoming in Minkowski Space-time”
8. Dieks (1988), “Discussion: Special Relativity and the Flow of Time”
9. Dieks (2006), “Becoming, Relativity and Locality”
10. DiSalle (1994), “On Dynamics, Indiscernibility, and Spacetime Ontology”
11. DiSalle (1995), “Spacetime Theory as Physical Geometry”
12. DiSalle (2006b), *Understanding Space-Time: The Philosophical Development of Physics from Newton to Einstein*: ch. 4, §§1–3
13. Dorato (2006), “Absolute Becoming, Relational Becoming and the Arrow of Time: Some Non-Conventional Remarks on the Relationship Between Physics and Metaphysics”
14. Earman (2008), “Reassessing the Prospects for a Growing Block Model of the Universe”
15. Earman (1989), *World Enough and Space-Time*: ch. 5, §§3-7
16. Friedman (1977), “Simultaneity in Newtonian Mechanics and Special Relativity”
17. Friedman (1983), *Foundations of Space-Time Theories*: ch. IV
18. Geroch (1981), *General Relativity from A to B*: chs. 4–5
19. Gibson and Pooley (2006), “Relativistic Persistence”
20. Grünbaum (1977), “Absolute and Relational Theories of Space and Space-Time”
21. Malament (1977), “Causal Theories of Time and the Conventionality of Simultaneity”
22. Malament (2009), “Lecture Notes on Geometry and Spacetime”: §§1–3
23. Putnam (1967), “Time and Physical Geometry”
24. Reichenbach (1958), *The Philosophy of Space & Time*: ch. II; ch. III, §§24–25
25. Russell (1997), *The ABC of Relativity*
26. Russell (1927), *The Analysis of Matter*: ch. v
27. Saunders (2002), “How Relativity Contradicts Presentism”
28. Sklar (1981), “Time, Reality and Relativity”
29. Sklar (1976), *Space, Time and Spacetime*: ch. 2, §C.1; ch. 4, §§A–C
30. Synge (1960b), *Relativity: The Special Theory*
31. Torretti (1984), *Relativity and Geometry*: ch. 4; ch. 7, §1

Lecture 7: NO CLASS, DR. CURIEL OUT OF TOWN (28. Nov)

Lecture 6: General Relativity (05. Dec)

Required Reading

1. Stein (1977b), “Some Philosophical Prehistory of General Relativity”
2. Stein (1977a), “On Space-Time and Ontology: Extract from a Letter to Adolf Grünbaum”

Suggested Reading

1. Stein (1970c), “On the Paradoxical Time-Structures of Gödel”
2. Stein (1990b), “Introductory Note to the Paper of Kurt Gödel, “A Remark about the Relationship between Relativity Theory and Idealistic Philosophy””
3. Stein (1995), “Introductory Note to the Paper of Kurt Gödel, “Some Observations about the Relationship between Theory of Relativity and Kantian Philosophy””
4. Brown (2005), *Physical Relativity: Space-Time Structure from a Dynamical Perspective*: ch. 9
5. Curiel (2009), “General Relativity Needs No Interpretation”
6. Curiel (2016), “On the Existence of Spacetime Structure”
7. DiSalle (1994), “On Dynamics, Indiscernibility, and Spacetime Ontology”
8. DiSalle (1995), “Spacetime Theory as Physical Geometry”
9. DiSalle (2006b), *Understanding Space-Time: The Philosophical Development of Physics from Newton to Einstein*: ch. 4, §§4–7; ch. 5
10. DiSalle (2006a), “Kant, Helmholtz, and the Meaning of Empiricism”
11. Eddington (1920), *Space, Time & Gravitation: An Outline of the General Theory of Relativity*
12. Earman (1989), *World Enough and Space-Time: Absolute versus Relational Theories of Space and Time*: chs. 8–9
13. Friedman (1983), *Foundations of Space-Time Theories*: ch. v
14. Geroch (1981), *General Relativity from A to B*: ch. 6
15. Grünbaum (1977), “Absolute and Relational Theories of Space and Space-Time”
16. Harper (1995), “Kant, Riemann and Reichenbach on Space and Geometry”
17. Helmholtz (1868), “Über die Tatsachen, welche der Geometrie zu Grunde liegen” (“On the Facts, Which Lie at the Basis of Geometry”)
18. Helmholtz (1870), “Über den Ursprung und die Bedeutung der geometrischen Axiome” (“On the Origin and Significance of the Geometrical Axioms”)
19. Reichenbach (1958), *The Philosophy of Space & Time*: ch. I
20. Riemann (1854), “Über die Hypothesen, welche der Geometrie zu Grunde liegen” (“On the Hypotheses, Which Lie at the Basis of Geometry”); also see Curiel (2014), “A Glossary for Riemann’s “On the Hypotheses, Which Lie at the Basis of Geometry” (“Über die Hypothesen, welche der Geometrie zu Grunde liegen”)
21. Russell (1927), *The Analysis of Matter*: chs. VI–IX
22. Sklar (1985), “Inertia, Gravitation and Metaphysics”
23. Sklar (1976), *Space, Time and Spacetime*: ch. II, §B.5–6
24. Synge (1960a), *Relativity: The General Theory*
25. Torretti (1984), *Relativity and Geometry*: chs. V–VI
26. Torretti (1978), *Philosophy of Geometry from Riemann to Poincaré*: ch. 2, §§1–3; ch. 3, §1
27. Weyl (1949), *Philosophy of Mathematics and Natural Science*: Part I, ch. III; Part II, ch. 1



## Lectures 8–11: Methodology, Epistemology, and the Structure of Our Knowledge in Physics (12. Dec 2018 – 09. Jan 2019)

### Required Reading

1. Stein (1994b), “Some Reflections on the Structure of Our Knowledge in Physics”
2. Stein (2004a), “The Enterprise of Understanding and the Enterprise of Knowledge—for Isaac Levi’s Seventieth Birthday”
3. Stein (shedg), “Physics and Philosophy Meet: The Strange Case of Poincaré”
4. Stein (1992), “Was Carnap Entirely Wrong, After All?”
5. Stein (1990c), “On Locke, ‘the Great Huygenius, and the Incomparable Mr. Newton””
6. Stein (1970b), “On the Notion of Field in Newton, Maxwell and Beyond”: §III (pp. 285–287)

### Suggested Reading

1. Stein (1972), “Graves on the Philosophy of Physics”
2. Stein (1979), “On Newton and Einstein”
3. Stein (1987), “After the Baltimore Lectures: Some Philosophical Remarks on the Subsequent Development of Physics”
4. Stein (1993), “On Philosophy and Natural Philosophy in the Seventeenth Century”
5. Stein (1994a), “Notes of Stein’s Lectures on Maxwell’s Theory of Electromagnetism and Its Development”
6. Carus (2017), “Carnapian Rationality”
7. Carnap (1936), “Testability and Meaning”
8. Carnap (1959), *The Logical Syntax of Language*: Part v
9. Carnap (1956a), “Empiricism, Semantics and Ontology”
10. Carnap (1956b), “The Methodological Character of Theoretical Concepts”: §§I–VI (pp. 38–52)
11. Carnap (1966), *An Introduction to the Philosophy of Science: Philosophical Foundations of Physics*: part v, chs. 23–26 (pp. 225–256)
12. Curiel (2001), “A Plea for Modesty: Against the Current Excesses in Quantum Gravity”
13. Curiel (2017a), “On the Propriety of Physical Theories as a Basis for Their Semantics”
14. Curiel (2017b), “Schematizing the Observer and the Epistemic Content of Theories or Getting the Theory into the Laboratory”
15. Demopoulos (2013d), “On the Rational Reconstruction of Our Theoretical Knowledge”
16. Demopoulos (2013e), “Three Views of Theoretical Knowledge”
17. Downing (2014), “Locke’s Metaphysics and Newtonian Metaphysics”
18. van Fraassen (1980), *The Scientific Image*, chs. 3–4
19. van Fraassen (2008), *Scientific Representation: Paradoxes of Perspective*: ch. 3; chs. 6–7, pp. 141–190
20. Friedman (2001), *The Dynamics of Reason*: Part One (pp. 3–70); Part Two, §§1–2 (pp. 71–92)
21. Friedman (2011), “Carnap on Theoretical Terms: Structuralism without Metaphysics”
22. Lakatos (1970), “Falsification and the Methodology of Scientific Research Programmes”
23. Maxwell (1856), “On Faraday’s Lines of Force”
24. Maxwell (1864), “A Dynamical Theory of the Electromagnetic Field”

25. [Nersessian \(2002\)](#), “Maxwell and the “Method of Physical Analogy”: Model-Based Reasoning, Generic Abstraction and Conceptual Change”
26. [Putnam \(1979\)](#), “What Theories Are Not”
27. [Quine \(1960\)](#), “Carnap and Logical Truth”
28. [Quine \(1980\)](#), “Two Dogmas of Empiricism”
29. [Shimony \(2002b\)](#), “Some Intellectual Obligations of Epistemological Naturalism”

## JANUARY 14–25, 2019: REGISTER WITH LSF SYSTEM ONLINE TO TAKE COURSE FOR CREDIT

See [https://www.pags.pa.uni-muenchen.de/dokumente/modularisiert/hilfe\\_lsf\\_anmeldung.html](https://www.pags.pa.uni-muenchen.de/dokumente/modularisiert/hilfe_lsf_anmeldung.html)

## Lectures 12–15: Physics and Metaphysics (15. Jan – 06. Feb)

1. [Stein \(1977b\)](#), “Some Philosophical Prehistory of General Relativity”
2. [Stein \(1977a\)](#), “On Space-Time Ontology: Extracts of a Letter to Adolf Grünbaum”
3. [Stein \(1994a\)](#), “Notes of Stein’s Lectures on Maxwell’s Theory of Electromagnetism and Its Development”
4. [Stein \(shedf\)](#), “On Metaphysics and Method in Newton”
5. [Stein \(2004b\)](#), “Newton’s Metaphysics”
6. [Stein \(shede\)](#), “Newton: Philosophy of Inquiry and Metaphysics of Nature”
7. [Stein \(shedb\)](#), “How Does Physics Bear Upon Metaphysics; and Why Did Plato Hold that Philosophy Cannot Be Written Down?”
8. [Stein \(1989\)](#), “Yes, but . . . : Some Skeptical Remarks on Realism and Anti-Realism”
9. [Stein \(1970b\)](#), “On the Notion of Field in Newton, Maxwell and Beyond”: pp. 264–272 (end of §I.2)

Suggested:

1. [Stein \(1970d\)](#), “Replies to Comments by G. Buchdahl and M. Hesse on “On the Notion of Field in Newton, Maxwell and Beyond””
2. [Stein \(1981\)](#), ““Subtler Forms of Matter’ in the Period Following Maxwell”
3. [Stein \(1972\)](#), “Graves on the Philosophy of Physics”
4. [Stein \(1990b\)](#), “Introductory Note to the Paper of Kurt Gödel, “A Remark about the Relationship between Relativity Theory and Idealistic Philosophy””
5. [Stein \(1995\)](#), “Introductory Note to the Paper of Kurt Gödel, “Some Observations about the Relationship between Theory of Relativity and Kantian Philosophy””
6. [Stein \(1979\)](#), “On Newton and Einstein”
7. [Stein \(1987\)](#), “After the Baltimore Lectures: Some Philosophical Remarks on the Subsequent Development of Physics”
8. [Stein \(1993\)](#), “On Philosophy and Natural Philosophy in the Seventeenth Century”
9. [Boyd \(1991\)](#), “On the Current State of Scientific Realism”

10. Buchdahl (1970), “Comment on “On the Notion of Field in Newton, Maxwell and Beyond” by Howard Stein”
11. Carus (2017), “Carnapian Rationality”
12. Carnap (1956a), “Empiricism, Semantics and Ontology”
13. 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 \*\*\*]
14. Demopoulos (2013c), “On Extending ‘Empiricism, Semantics and Ontology’ to the Realism-Instrumentalism Controversy”
15. Demopoulos (2013a), “Carnap’s Analysis of Realism”
16. Einstein (1982), “Maxwell’s Influence on the Development of the Conception of Physical Reality”
17. van Fraassen (1980), *The Scientific Image*, ch. 2
18. van Fraassen (2008), *Scientific Representation*: chs. 12–13, pp. 269–308
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**FINAL PAPER DUE: 25. MARCH 2019**

**FINAL COURSE GRADES SUBMITTED: 15. APRIL 2019**

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