



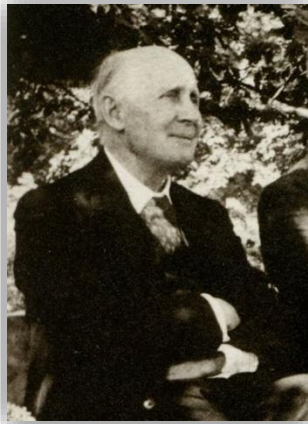
California Institute of Integral Studies

Whitehead's Adventure in Cosmology: Toward a Physics of the World-Soul

PARP 6133 | Fall 2017 | 3.00 Units | Online

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Proposed Syllabus as of 6/5/2017 (final syllabus to be provided in August)



“...we seek the evidence for that conception of the universe which is the justification for the ideals characterizing the civilized phases of human society.”

—Whitehead, *Modes of Thought*, p. 105

“We find ourselves in a buzzing world, amid a democracy of fellow creatures.”

—Whitehead, *Process and Reality*, p. 50

This course invites students to explore the relevance of Alfred North Whitehead's philosophy of organism to contemporary scientific cosmology. The course begins with key historical influences, including Friedrich Schelling's *Naturphilosophie*, William James' “world of pure experience,” and Henri Bergson's *Creative Evolution*. The course then examines Whitehead's journey from mathematics and logic, through the philosophy of science, and finally into the adventure of full-blown cosmological speculation. Following the collapse of the Newtonian paradigm in the early 20th century, Whitehead was compelled to imagine a more adequate and comprehensive philosophical background for the increasingly specialized and fragmented natural sciences. The course unpacks how Whitehead's novel interpretations of relativity, quantum, evolutionary, and complexity theories makes it possible to re-enchanted and re-ensoul the cosmos while still remaining consistent with the latest scientific findings.

Student Learning Outcomes

1. Students should grasp the key historical influences shaping Whitehead's cosmological vision (including Schelling, James, and Bergson).
2. Students should grasp the philosophical contribution of Whitehead's process-relational metaphysics to the project of developing an integral cosmology grounded in contemporary scientific findings.
3. Students should gain an appreciation for the basic outlines of Whitehead's alternative metaphysical interpretations of relativity, quantum, complexity, and evolutionary theories.

4. Students should gain a deeper appreciation for the importance of squaring an enchanted world view with the evidences of the natural sciences, while at the same time recognizing the ways in which a process-relational interpretation of the evidence in fact lends support to efforts to re-enchant the world.

Course Assessment Measures

Students have the grading option (OP) of either Pass/Fail or a letter grade. Grades are weighted according to a point system as follows:

- Participation in 10 Modules = 250 points
 - 10 “free” points for completing each module’s lecture & readings
 - 15 points for completing at least 2 discussion posts per module
- Mid-term papers = 25 points each
- Final paper = 60 points

Total = 360 points

For OP Grade

285 points (~80%) or higher = Pass

284 points or lower (~79%) = Fail

For Letter Grade

340 points (~95%) or higher = A Outstanding

320 points (~90%) or higher = A-Very Good

310 points (~87%) or higher = B+ Good

300 points (~84%) or higher = B Average

285 points (~80%) or higher = B- Below Average, but Passing

284 points (~79%) or lower = Failing

Course Texts and Reading Materials

1. *Physics of the World-Soul: The Relevance of Alfred North Whitehead’s Philosophy of Organism to Contemporary Scientific Cosmology* by Matthew Segall (Lulu Press, 2016).
2. Selections from *The Concept of Nature* by Alfred North Whitehead (Cambridge: Cambridge University Press, 1920/1964).
3. Selections from *Science and the Modern World* by Alfred North Whitehead (Cambridge: Cambridge University Press, 1925/1960).

4. Selections from *Process and Reality: An Essay in Cosmology* by Alfred North Whitehead (New York: The Free Press, 1929/1978).
5. Selections from *Adventures of Ideas* by Alfred North Whitehead (New York: The Free Press, 1933/1961).
6. Selections from *Modes of Thought* by Alfred North Whitehead (New York: The Free Press, 1938/1968).
7. Selections from *Interpretation of Science: Selected Essays* (edited by A. H. Johnson) by Alfred North Whitehead (New York: Liberal Arts Press, 1961).
8. Selections from “A World of Pure Experience I & II” by William James (*The Journal of Philosophy, Psychology and Scientific Methods*, 1904).
9. Selections from *The Journey of the Universe* by Brian Swimme and Mary Evelyn Tucker (New Haven: Yale University Press, 2011).
10. Selections from *Incomplete Nature: How Mind Emerged from Matter* by Terrence Deacon (New York: W. W. Norton, 2012).
11. Selections from *Quantum Mechanics and the Philosophy of Alfred North Whitehead* by Michael Epperson (New York: Fordham, 2004).
12. Selections from *Physics and Whitehead: Quantum, Process, and Experience* edited by Timothy Eastman and Hank Keeton (New York: State University of New York, 2003).
13. Selections from *Process-Relational Philosophy: An Introduction to Alfred North Whitehead* by C. Robert Mesle (West Conshohocken: Templeton Press, 2008).
14. Selections from *Philosophy in Science: An Historical Introduction* by Michael Heller (New York: Springer, 2011).
15. Selections from *Constructing a Relational Cosmology* edited by Paul O. Ingram (Eugene, OR: Pickwick, 2006).
16. Selections from *From a Broken Web: Separation, Sexism, and Self* by Catherine Keller (Boston: Beacon Press, 1986).
17. Selections from *The Library of Living Philosophers: The Philosophy of Alfred North Whitehead* edited by Paul Arthur Schilpp (New York: Tudor Publishing Company, 1951).
18. Selected articles from *Process Studies Journal* (<http://www.ctr4process.org/publications/process-studies>).
19. Selected articles from *Cosmos and History: The Journal of Natural and Social Philosophy* (<https://www.cosmosandhistory.org>).

Note that all readings will be provided to students electronically as PDFs uploaded to the Canvas LMS.

Written Assignments

Students are required to post an initial ~300 word reflection and/or questions in the Canvas discussion forum in response to each module’s readings and lecture. Students are also required to make a second post either in response to the instructor’s reply to their initial post or in response to

another student's post. Students are welcome to use Canvas' built in vlog feature to record short 5-7 minute audio or video reflections/questions in place of the written discussion posts or replies. Please make every effort to post prior to or early in the day on the module's due date, as this will give me and other students time to reply to you while the module is still underway.

In addition to the discussion forums, students are required to submit two mid-term essays (~1000 words each) due on Sept. 24th and October 22nd. Students are also required to submit a final paper (~4500 words) due on Dec. 21st. Rubrics for the papers are available on Canvas. The writing prompts below are suggestions. Students can consult with the instructor if another question or topic interests them. Students should feel free to develop and incorporate their discussion forum posts into their mid-terms or final paper.

1. **Mid-term #1:** Suggested prompt: What new scientific developments led Whitehead from his work on mathematics and logic into full-fledged metaphysical cosmology?
2. **Mid-term #2:** Suggested prompt: Do you think the process-relational perspective successfully reconciles relativity with quantum theory? Why or why not?
3. **Final Paper:** Students should use their final essay both to display their grasp of the material and to argue for their own perspective. Using the course readings, secondary resources, and consultation with the instructor, students should develop and pursue a research question of their own. One option, as an example, would be to explain the disagreement between Bergson and Einstein, and how Whitehead attempted to reconcile the two.

Reading & Assignments Summary:

The course will be organized into ten 10-day modules. I will list the readings below, including a total page count. Given that you have 10 days, I've aimed for approximately 100 pages of reading per module (i.e., an average of about 10 pages of reading per day).

§ Introduce yourself on Canvas by Sat 8/26 at 11:59pm

§ Module 1: Ancient & Early Modern Cosmology - Begin readings and lecture on Thur 8/24; Discussion posts due no later than Sat 9/2 at 11:59pm.

Readings (111 pages total):

- 1) *Philosophy in Science: An Historical Introduction* by Heller, Chs.1-7/pgs. 1-72 on Ancient Greek physiologists, Plato, Aristotle, Descartes, Newton, & Leibniz.
- 2) *Science and the Modern World* by Whitehead, Ch. 1: "The Origins of Modern Science," pgs. 1-20 and Ch. 2: "Mathematics as an Element in the History of Thought," pgs. 20-39.

§ Module 2: Whitehead's Interpretation of the History of Cosmology - Begin readings and lecture on Sat 9/2; Discussion posts due no later than Tue 9/12 at 11:59pm.

Readings (97 pages total):

- 1) *Physics of the World-Soul* by Segall, Ch. 1: "From Physics to Philosophy," pgs. 5-15.
- 2) *Science and the Modern World* by Whitehead, Ch. 3: "The Century of Genius, pgs. 39-57 and Ch. 4: "The Eighteenth Century," pgs. 57-75.
- 3) *Adventures of Ideas* by Whitehead, Ch. 7: "Laws of Nature," pgs. 103-118; Ch. 8: "Cosmologies," pgs. 118-139; and Ch. 9: "Science and Philosophy," pgs. 140-159.

§ Module 3: Whitehead's Romantic Influences - Begin readings and lecture on Tue 9/12; Discussion posts due no later than Fri 9/22 at 11:59pm.

Readings (100 pages total):

- 1) *Science and the Modern World* by Whitehead, Ch. 5: "The Romantic Reaction," pgs. 75-96.
- 2) *Philosophy in Science* by Heller, Ch. 9: "The Romantic Philosophy of Nature," pgs. 85-98.
- 3) *Process Studies Journal*, "Whitehead and German Idealism: A Poetic Heritage" by Antoon Braeckman, 22 pgs.
- 4) *Cosmos and History: The Journal of Natural and Social Philosophy*, "From Kant to Schelling to Process Metaphysics: On the Way to an Ecological Civilization" by Arran Gare, 44 pgs.

Mid-Term 1 – Due Sun 9/24 by 11:59pm

§ Module 4: Whitehead's Philosophy of Science & Method of Speculative Philosophy - Begin readings and lecture on Fri 9/22; Discussion posts due no later than Sun 10/1 at 11:59pm.

Readings (101 pages total):

- 1) *Physics of the World-Soul* by Segall, Ch. 2: "Whitehead's Philosophy of Science," pgs. 16-30.
- 2) *The Journal of Philosophy, Psychology and Scientific Methods*, "A World of Pure Experience I-II" by William James, 21 pgs.
- 3) *The Concept of Nature* by Whitehead, Ch. 2: "Theories of the Bifurcation of Nature," pgs. 18-32.
- 4) *Process-Relational Philosophy: An Introduction to Alfred North Whitehead* by C. Robert Mesle, Chs. 1-2, pgs. 3-19.
- 5) *Process and Reality: An Essay in Cosmology* by Whitehead, Preface and Ch. 1: "Speculative Philosophy," pgs. xi-17.
- 6) *Adventures of Ideas* by Whitehead, Ch. 15: "Philosophic Method," pgs. 220-238.

§ Module 5: Whitehead's Process-Relational Cosmology - Begin readings and lecture on Sun 10/1; Discussion posts due no later than Wed 10/11 at 11:59pm.

Readings (106 pages total):

- 1) *Process-Relational Philosophy: An Introduction to Alfred North Whitehead* by C. Robert Mesle, Appendix, pgs. 93-110.
- 2) *Physics of the World-Soul* by Segall, Ch. 3: "Whitehead's Ontology of Organism," pgs. 31-46.
- 3) *Philosophy in Science* by Heller, Ch. 10: "The Cosmology of Whitehead: The Universe as Process," pgs. 101-112.

4) *Modes of Thought* by Whitehead, Ch. 6: “Civilized Universe,” Ch.7: “Nature Lifeless,” and Ch. 8: “Nature Alive,” pgs. 105-170.

§ Module 6: Whitehead and Contemporary Cosmology I: Evolutionary and Complexity Theories - Begin readings and lecture on Wed 10/11; Discussion posts due no later than Sat 10/21 at 11:59pm.

Readings (113 total pages):

- 1) *Incomplete Nature* by Terence Deacon, Ch. 2: “Humunculi,” pgs. 46-79.
- 2) *Physics of the World-Soul* by Segall, Ch. 4: “Whitehead and Contemporary Scientific Theory,” pgs. 47-99.
- 3) *Science and the Modern World* by Whitehead, Ch. 6: “The Nineteenth Century,” pgs. 96-115.
- 4) *Journey of the Universe* by Brian Swimme and Mary Evelyn Tucker, Ch. 10: “Rethinking Matter and Time,” pgs. 103-109.

Mid-term 2 – Due Sun 10/22 by 11:59pm

§ Module 7: Whitehead and Contemporary Cosmology II: Relativity and Quantum Theories - Begin readings and lecture on Sat 10/21; Discussion posts due no later than Tue 10/31 at 11:59pm.

Readings (115 total pages):

- 1) *Physics and Whitehead: Quantum, Process, and Experience* edited by Timothy Eastman and Hank Keeton, Ch.12: “Spacetime and Becoming: Overcoming the Contradiction between Special Relativity and the Passage of Time” by Niels Viggo Hansen, pgs. 136-162.
- 2) *Interpretation of Science*, Ch. X: “Einstein’s Theory: An Alternative Suggestion” by Alfred North Whitehead, pgs. 125-135.
- 3) *Science and the Modern World* by Whitehead, Ch. 7: “Relativity” and Ch. 8: “The Quantum Theory,” pgs. 115-138.
- 4) *Quantum Mechanics and the Philosophy of Alfred North Whitehead* by Michael Epperson, Ch. 1: “Introduction,” “Interlude on ANW,” “Summary and Outlook,” (56 pgs).

§ Module 8: Whitehead and Feminist Cosmology - Begin readings and lecture on Tue 10/31; Discussion posts due no later than Thu 11/9 at 11:59pm.

Readings (98 pages total):

- 1) *From a Broken Web: Separation, Sexism, and Self* by Catherine Keller, Ch. 4: “The Selves of Psyche,” pgs. 155-215.
- 2) *Constructing a Relational Cosmology* edited by Paul O. Ingram, Ch. 7: “Beyond a Feminist Cosmology” by Nancy Howell, pgs. 104-116 and Ch. 6: “Does Feminism Need Process? Yes, No, Maybe, All of the Above,” pgs. 91-103.
- 3) *Physics of the World-Soul* by Segall, Ch. 5: “Towards a Physics of the World-Soul,” pgs. 100-114.

§ Module 9: Whitehead's Ultimate Vision: God and the World - Begin readings and lecture on Thu 11/9; Discussion posts due no later than Sat 11/18 at 11:59pm.

Readings (99 pages total):

- 1) *Process and Reality* by Whitehead, Part V: "Final Interpretation," Ch. 1: "The Ideal Opposites" and Ch. 2: "God and the World," pgs. 337-352.
- 2) *Adventures of Ideas* by Whitehead, Ch. 16: "Truth," Ch. 17: "Beauty," Ch. 18: "Truth and Beauty," Ch. 19: "Adventure," and Ch. 20, "Peace," pgs. 241-296.
- 3) *The Philosophy of Alfred North Whitehead* edited by Paul Arthur Schilpp, "Immortality" by Alfred North Whitehead, pgs. 682-700.

§ Module 10: Review and Prospects for Panpsychist Physics - Begin readings and lecture on Sat 11/18; Discussion posts due no later than Thu 11/30 at 11:59pm (two extra days have been added to this module to accommodate the Thanksgiving Holiday).

Final Exam – Due Thu 12/21 by 11:59pm.

Relevant Policies

- **Attendance and tardiness:** Students must complete all course modules on time unless extreme circumstances are discussed with the instructor prior to absence.
- **Academic integrity policy:** see CIIS policy:
<http://www.ciis.edu/Documents/Administration/AVP/CIIS%20Policies/Academic%20Integrity.pdf>
- **Statement on diversity:** This is a course focusing specifically on the contributions of Alfred North Whitehead to contemporary scientific cosmology. Secondary readings draw upon as diverse a range of authors as possible. Module 8 will focus specifically on feminist responses to Whitehead's cosmology. Students are also invited to bring alternative perspectives into class discussions and their mid-term and final papers. As process-relational cosmology is grounded in a pluralistic ontology, and as process theology is grounded in a persuasive rather than coercive conception of divine power, applications to social and political issues, while perhaps not immediately obvious, could be drawn out by students in discussion posts and papers.