The Persistence of Reality
an honors learning community
Spring 2007
Course Information

<table>
<thead>
<tr>
<th>Prof. James Dutcher</th>
<th>Prof. Ileana Vasu</th>
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<td>Office: DON 349</td>
<td>Office: FR 364</td>
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<td>Telephone: 552-2357</td>
<td>Telephone: 552-2438</td>
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Office Hours:
MWF 11:00 – 12:15
TR 1:45 – 2:30

Office Hours:
MW 11:00 – 12:00
WF 8:00 – 9:00; R 12:00 – 1:00

Office hours are scheduled for the purpose of meeting with students, so please do not hesitate to come to our offices to talk during these hours or whenever else is mutually convenient. You are always welcome to meet with us. If you have any problems, questions, or need help regarding your schoolwork, please come to see us.

Course descriptions:

Einstein said that “reality is merely an illusion, albeit a very persistent one.” If reality is an illusion, then it isn’t real, right? And if reality lurks within illusion, then how do we look for it?

Just as Alice travels down the rabbit-hole into Wonderland—a land of logical nonsense and deliberate contradictions—our learning community will make a journey to examine the multiple dimensionality of life. Hidden below the surface of things, we’ll discover ambiguity and double meanings everywhere. We’ll have to pause and question our own preconceived ideas about reality, what we know, and how we know it, or whether we know anything at all. We may truly be confused at times, but as we persist we’ll find ourselves arriving at another dimension, one where new ways of seeing and understanding are possible.

While Alice attends mad tea parties and quirky croquet games, we’ll pause to marvel at the garden before us: perfectly ordered patterns and shapes, mirrors and symmetry. We’ll play in the garden for a while and then we’ll meander to Flatland, a world bound to only two dimensions, and to Arcadia, where space and time travel are possible. Here, we’ll stumble upon some intricate and eerily beautiful patterns named fractals, and the self-symmetry they display. Oh, we’ll also run into some chaos, but don’t worry; we’ll make it back ok—a bit wiser, perhaps, and with a different understanding of the beauty that surrounds us.

Possible texts include Abbott’s Flatland, Capra’s The Web of Life, Crichton’s Jurassic Park, Carroll’s Alice’s Adventures in Wonderland and Alice Through the Looking Glass, Lightman’s Einstein’s Dreams, Stoppard’s Arcadia, Fadiman’s The Mathematical Magpie, Brown’s Verse and Universe, Robbins’ Skinny Legs and All, Borges’ Labyrinths, Boyd’s Brazzaville Beach, Shakespeare’s The Tempest, García Márquez’, One Hundred Years of Solitude, Woolf’s Orlando, and Lao Tzu’s Tao Te Ching.

ENG 230, Current Themes in Literature: Begins with a contemporary work that embodies a theme of current interest, and aims at developing a perspective on that theme in a representative selection of literature. Prerequisite: ENG 102, previously or concurrently.
MTH 155, Topics in Mathematics: an exploratory course in mathematics for the liberal-arts student. It will not be a repeat of high school algebra. Rather, the unity of mathematical thought will be presented through the diversity of scientific ideas shaping our understanding of the world. You will explore the mathematical ways of thinking, inductive vs. deductive reasoning, and solve puzzles in order to understand how we know what we know; how we acquire, modify, and use our knowledge. Topics will include number sequences, topics in geometry such as polygons, polyhedra, fractals and chaos, infinity and the fourth dimension, puzzles and paradoxes.

The Class:
In addition to the exploration into the intellectual and technical aspects of literature and mathematics, the aim of this course is to encourage critical, i.e. analytical, thinking and to develop mathematical, reading, research, and writing skills. The course is designed to develop your ability to think in a variety of academic disciplines: to understand, to intuit, and to reason as well as to introduce you to inductive and deductive reasoning and to problem solving. Essay assignments, reading and writing assignments, problem-solving exercises, and exams will be directed toward all of these goals. Students should be willing to use one of the larger academic libraries in the area if the HCC Library is unable to provide sufficient research materials. The class will consist of lecture, discussion, group work, and student presentations. Active student participation is required. This course offers you a broad-based overview of many branches of learning and will provide you with skills that you can use in everyday life and use to learn more about the world in which we live.

Attendance Policy:
Attendance is required but you are allowed three absences without penalty. Excuses are not needed and should not be offered. Arriving late or leaving early may count as an absence. If you miss more than three classes (for whatever reason), you should withdraw officially or expect the possibility of a substantial reduction in your final grade or of being dropped with a grade of AW. Disruptive behavior may also result in withdrawal from the class or an AW. Make-up quizzes or exams will not be given except in extraordinary circumstances. If you cannot avoid missing a class, contact another student to learn what you have missed. (Please keep in mind that the syllabus is subject to change and that changes will be announced in class.)

Grades:
Grades will be determined from all papers, essays, in-class exercises, quizzes, and exams. Effort, class participation, and improvement will also influence your final grade. This course operates on the assumption that students are engaged in a learning process and that they have not enrolled in a class having already mastered all of the materials and skills. Course grading therefore—entirely at the instructors’ discretion—may overlook early work in the semester if the student's work shows sustained improvement and effort. In no case, however, except when plagiarism or poor attendance is involved, will a student’s course grade be less than an average of all quiz, paper, and exam grades.

Students will receive a grade of B+ automatically on all one-page “critical reaction” papers if they are handed in on time and meet a reasonable expectation of competency. This policy is meant to encourage creativity and risk-taking. Outstanding work will receive a higher grade.

All assignments must be completed in order to pass the course.
Papers and Assignments:
Your writing is expected to be clear, well-organized, and free of errors in grammar, spelling, and mechanics. We will be happy to help anyone with writing difficulties, so please ask for help. You are always welcome to ask for help with research, outlines, rough drafts, or any other aspect of your work. Papers must be typed and must follow the MLA style as explained and illustrated in the MLA Handbook (5th ed., 1999). We will cover this style in class, but again, if you have any questions or problems, please ask for help. Always (for all of your college courses) keep a copy or a final draft of papers that you hand in. Always save all of your papers until after you receive your final course-grade (if not forever!). This is your responsibility.

Late work will not be accepted and missed work cannot be ‘made up’ except under extraordinary circumstances. Papers and other assignments must be handed in to the professors and may not be emailed. All assignments must be completed in order to pass the course.

Plagiarism:
“In short, to plagiarize is to give the impression that you have written or thought something that you have in fact borrowed from someone else” (MLA Handbook, 3rd ed., 21). Plagiarism, even unintentional, may result in failure and a note in your college record. For more information see the HCC College Guide and Handbook, the MLA Handbook, or one of your instructors.

Required Equipment
Scientific calculator.

Required Texts
Carroll, Lewis. Alice’s Adventures in Wonderland and Through the Looking Glass. New York: Barnes and Noble Classics, 2004
**Bibliography**


Plato. *The Republic*.


**Supplemental Bibliography**


**Filmography**

*Being John Malkevich*  
*Dr. Strangelove*  
*Matrix*  
*Mind Walk*  
*Prospero’s Books*  
*The Truman Show*  
*Waking Life*
### The Persistence of Reality

**Spring 2007**

**Syllabus**

*Sensation & Perception: What is reality?—what our senses tell us!*

“Reality is merely an illusion, albeit a very persistent one” (Albert Einstein)

#### Week 1: Ways of Knowing

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<th>Date</th>
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<tr>
<td>Mon. 1/22</td>
<td>Introduction to the course, the texts, and to each other.</td>
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<td>* Constantin Brancusi’s sculpture <em>Golden Bird</em> and Mina Loy’s poem</td>
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<td>“Constantin Brancusi, <em>Golden Bird</em>, 1919/20.” Small group work:</td>
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<td>what do the two works have to say about reality?</td>
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<td>* In-class writing: you have 20 minutes to define reality—or else!</td>
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<td>Puzzles: Counting Squares, Counting Triangles. How do you know your</td>
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<td>answer is the real answer?</td>
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<td>Sign up for collaborative paper (due week 5). Choose one:</td>
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<td>1. Prediction</td>
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<td>2. Nature and Numbers: numerical/geometrical—Symmetry,</td>
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<td>Fibonacci Sequence, the Golden Ratio</td>
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<td>3. Art and math, e.g., Da Vinci, Picasso, Cezanne, Dali, Escher,</td>
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<td>perspective, drawing, proportion</td>
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<td>4. Topology and its applications—the shape of space, DNA research, and</td>
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<td>NonEuclidean Geometries</td>
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<td>5. Mathematical Realities: e.g., irrational numbers, e, imaginary</td>
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<td>numbers, infinity, pi</td>
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<td>6. Dimensionality</td>
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<td>7. Theory of Relativity (e.g., spacetime)</td>
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<td>8. Uncertainty</td>
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<td>Wed. 1/24</td>
<td>Wallace Stevens, “Thirteen Ways of Looking at a Blackbird” (handout).</td>
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<td>Still Puzzled: stories 1, 3, 5, 7 in chapter 1 from *The Heart of</td>
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<td>Mathematics*, pp. 4-26 (if time, prob. 5, 8, 10 pp. 29).</td>
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<td>Fri. 1/28</td>
<td>Small group discussion and individual writing: how do you know what</td>
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<td>you know?</td>
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<td>Critical Reaction paper due on Plato, reality, and math (one page).</td>
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<td>Discuss Plato’s allegory and epistemology.</td>
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<td>Knowing through Inductive Reasoning: The Chessboard Problem.</td>
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**Subject: Yes, spelling counts.**

According to the Knight Ridder News Service, the inscription on the metal bands used by the US Department of the Interior to tag migratory birds has been changed. The bands used to bear the address of the Washington Biological Survey, abbreviated as “Wash. Biol. Surv.,” until the agency received the following letter from an Arkansas camper:

Dear Sirs: While camping last week I shot one of your birds. I think it was a crow. I followed the cooking instructions on the leg tag and I want to tell you it was horrible.

The bands are now marked “Fish & Wildlife Service.”
Persistent Reality, 6

Week 2: Dreams

| Mon. 1/29 | Carroll, Alice in Wonderland, pp. 3-69.  
Patterns.  
Jacobs, Inductive Reasoning (handout, MHE).  
Jacobs, Limitations of Inductive Reasoning (handout, MHE).  
Discussion of “seminaring” and sign-up for student-led seminars on The Turbulent Mirror and Skinny Legs and All. |
| Wed. 1/31 | Carroll, Alice in Wonderland, pp. 70-137.  
Jacobs, Deductive Reasoning (handout, MHE). |
| Fri. 2/2 | Carroll, Alice in Wonderland, pp. 138-209.  
* Critical reaction paper due on Alice, math, and reality (one page).  
* Quiz: Inductive/Deductive Reasoning  
Turbulent Mirror, Foreword and Prologue, pp. 11-29 (student leaders). |

If a man’s wit be wandering, let him study mathematics. (Francis Bacon)

“Nothing is really real unless it happens on television.”  
(Daniel Boorstin, former Librarian of Congress)

After a lecture on cosmology and the structure of the solar system, William James was accosted by a little old lady.

“Your theory that the sun is the center of the solar system, and the earth is a ball which rotates around it, has a very convincing ring to it, Mr. James, but it’s wrong. I’ve got a better theory,” said the little old lady.

“And what is that, madam?” inquired James politely.

“That we live on a crust of earth which is on the back of a giant turtle.”

Not wishing to demolish this absurd little theory by bringing to bear masses of scientific evidence he had at his command, James decided to gently dissuade his opponent by making her see some of the inadequacies of her position.

“If your theory is correct, madam,” he asked, “what does this turtle stand on?”

“You’re a very clever man, Mr. James, and that’s a very good question,” replied the little old lady, “but I have an answer to it. And it is this: the first turtle stands on the back of a second, far larger turtle, who stands directly under him.”

“But what does this second turtle stand on?” persisted James patiently.

To this the little old lady crowed triumphantly. “It’s no use, Mr. James—it’s turtles all the way down.”

J.R. Ross, Constraints on Variables in Syntax
### Week 3: Illusion

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“*It don't even make good nonsense.*”  
(Mark Twain)

“*Two paradoxes are better than one; they may even suggest a solution.*” (Edward Teller)

> Nature and Nature’s Laws lay hid in Night  
> God said, “Let Newton be” and it all was light.  
> Alexander Pope

### Week 4: Infinity (Illusion, Part II)

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<th>Date</th>
<th>Activity</th>
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<pre><code>      | * Math Take Home Assignment Due. Bachelard, *The Poetics of Space*, “Shells” (handout)—if time allows. |
</code></pre>
| Fri. 2/16| Number Patterns in Nature: Growth and the Fibonacci Sequence. Critical Reaction paper due on *Skinny Legs* and reality (one page).  

“*Do not worry about your problems with mathematics; I assure you mine are far greater.*”  
(Albert Einstein)
“I do not know what I may appear to the world, but to myself I seem to have
been only a boy playing on the seashore, and diverting myself in now and then
finding a smoother pebble or a prettier shell than ordinary, whilst the great
ocean of truth lay all undiscovered before me.”  (Isaac Newton’s musings)

“I do not resent criticism, even when, for the sake of emphasis,
it parts for the time with reality.”
Sir Winston Churchill, House of Commons, 22 January 1941.

In our endeavor to understand reality we are somewhat like a man trying to
understand the mechanism of a closed watch.  He sees the face and the moving
hands, even hears its ticking, but he has no way of opening the case.  If he is
ingenious he may form some picture of a mechanism which could be responsible for
all the things he observes, but he may never be quite sure his picture is the only one
which could explain his observations.

—Einstein and Infeld, *The Evolution of Physics*

### Week 5: Chaos

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<th>Mon. 2/19</th>
<th>Presidents’ Day Holiday: no reality today.</th>
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| Tues. 2/20 | Monday Schedule.  
Collaborative papers and presentations due. |
More number patterns: the Golden Ratio and the Golden Rectangle (also
called the Divine Proportion) from, *The Heart of Mathematics*, pp. 233-244. |
* Critical Reaction paper due on *The Tempest* and reality (one page).  
Film clip from Peter Greenaway’s *Prospero’s Books*.  
* *Turbulent Mirror*, ch. 3, pp. 53-65 (student leaders). |

"The nineteenth century dislike of Realism is the rage of Caliban seeing his own face in the
glass."
Oscar Wilde, *The Picture of Dorian Gray* (1891), preface

"Mathematics, rightly viewed, possesses not only truth, but supreme
beauty - a beauty cold and austere, like that of sculpture."
Bertrand Russell (1872 - 1970)

Chaos seeks you as its natural ally in the universe.  (Cyndi Miller)
# Week 6: Paradox

**Mon. 2/26**
- Piet Hut, “Structuring Reality: The Role of Limits” (handout—be super-prepared to seminar on this piece).
- The Golden Ratio.
- Math Quiz.
- Group discussion and writing: is nature written in numbers?

**Wed. 2/28**
- Geometrical Patterns: Symmetry and Regular Figures.
- Polygons and Angles.

**Fri. 3/2**
- Movie: *Donald in Mathmagicland* (if time permits).
- The Fourth Dimension through Analogy.
- *Turbulent Mirror*, ch. 4, pp. 66-77 (student leaders).

“A paradox is not a conflict within reality. It is a conflict between reality and your feeling of what reality should be like.” —Richard Feynman

# Week 7: Space

**Mon. 3/5**
- John R. Searle, from *The Construction of Social Reality*:
  - Ch. 7, “Does the Real World Exist? Part I: Attacks on Realism.”
  - Ch. 8, “Does the Real World Exist? Part II: Could There Be a Proof of External Realism?” (handouts: be super-prepared to seminar on Searle, too).
- Guest lecturer: Prof. Jack Mino.
- Plato’s Cave Revisited: How can you, a three dimensional being, create an accurate image of four-dimensional space?
- Topics for *Flatland* suggested.

**Wed. 3/7**
- Jeffrey Weeks, *Exploring the Shape of Space* (handout).
- How big is the universe? Is space finite or infinite? Is there an edge to space?

**Fri. 3/9**
- Learning Community Student Evaluation (SGIDS).
- Video: *The Shape of Space*.
- Critical reaction paper due on *Flatland* (one page).
- *Turbulent Mirror*, ch. 0, pp. 81-113 (student leaders).

Spring Recess, March 12-17: reality or fantasy?

“We add to reality. The world stands really malleable, waiting to receive its final touches at our hands.” (William James, *Pragmatism*)
Shall any gazer with mortal eyes
Or any searcher know with mortal mind –
Veil after veil will lift – but there must be
Veil after veil behind.

(Sir Edwin Arnold)

Week 8: Time

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<th>Mon. 3/19</th>
<th>Film: <em>The Waking Life</em>.</th>
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<td>Fri. 3/24</td>
<td>Professional Development Day: No Classes . . . but <em>Our</em> class will take a field trip to the Clark Art Museum and Williams College.</td>
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“Oh! You’re missing the point! Of course women are emotional, of course they’re irrational, at least some of the time. At least they have the *capacity* for that—and thank God they do! Where did Descartes get us—with all his ‘Cogito Ergo Sum’ crap?” Hotchkiss looked up at her, astonished. “I don’t know,” he said. “Where?” “Here. Now. Sitting on top of nuclear power that could ruin you, me, and the future of the planet. He got it all wrong, all wrong, which wasn’t so bad; but if he had been a woman, he would have gotten it right.”

(Carol Hill, *The Eleven Million Mile High Dancer*, 66)

March 26—April 13 is pre-registration period. Be sure to make, and keep, an appointment with your advisor to pick up your mid-semester grades, discuss your academic progress, ask any questions you may have, and choose a schedule of classes for next semester (early, before classes get closed). Save time by arriving prepared with a Fall schedule already filled out, even if it is only a tentative schedule. Consider taking a learning community!

Human Kind
Cannot bear very much reality.

(T.S. Eliot, *Four Quartets*, Burnt Norton, 1)

“If the doors of perception were cleansed everything would appear as it is, infinite.” (William Blake, *A Memorable Fancy*, 14)
God has put a secret art into the forces of Nature so as to enable it to fashion itself out of chaos into a perfect world system.

(Immanuel Kant)

**Week 9: Spacetime**

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| Mon. 3/26 | Shapes.  
Read: “Exploring Relationships among Vertices, Edges and Faces,”  
Section 5.3 in *The Heart of Mathematics* pp. 359 – 371.  
| Wed. 3/28 | More shapes.  
Crichton, *Jurassic Park*, excerpts (handouts).  
*Critical reaction paper due on *Einstein’s Dreams* and reality (one page).* |
| Fri. 3/30  | *Five-page paper due: use as many of our texts, etc. (so far) as possible to define and explore the nature of reality.  
*Turbulent Mirror*, ch. 3, pp. 134-52 (student leaders).* |

The primary question was not What do we know, but How we do know it.  

(Aristotle)

Know all things to be like this:  
A mirage, a cloud castle, a dream, an apparition, without essence, but with qualities that can be seen.

Know all things to be like this:  
As the moon in a bright sky in some clear light reflected, though to that lake the moon has never moved.

Know all things to be like this:  
As an echo that derives from music, sounds, and weeping, yet in that echo is no melody.

Know all things to be like this:  
As a magician makes illusions of horses, oxen, carts, and other things, nothing is as it appears.

— the Buddha

We live in a fantasy world, a world of illusion. The great task in life is to find reality.  

—Iris Murdoch.

“Don’t tell me, young lady. Don’t tell me,” the thing said, highly annoyed. “I know you can’t see a subparticle, but I am a subparticle, so if anything knows its degree of material reality, it is the thing itself, right?”  

— Carol Hill, *The Eleven Million Mile High Dancer*, 229
Suppose that time is not a quantity but a quality, like the luminescence of the night above the trees just when a rising moon has touched the tree line.

Alan Lightman, *Einstein’s Dreams*

### Week 10: Fractals, Iteration

**Mon. 4/2**

  - Constructed Polyhedra Due.

**Wed. 4/4**
- CriticalReaction paper due on *Arcadia* and reality (one page).
- Iteration/ Fractals Laboratory (handout).
- Final paper proposals due.

**Fri. 4/6**
- Stoppard, *Arcadia*, continued.

> “Nothing ever becomes real till it is experienced—even a proverb is no proverb to you till your life has illustrated it.”
>  
> (John Keats)

### Week 11: The Way

**Mon. 4/9**
- Math Take Home Assignment Due.

**Wed. 4/11**
- Lao Tzu, *Tao Te Ching*.

**Fri. 4/13**
- Lao Tzu, *Tao Te Ching*, continued.
- Guest Lecturer, Professor Xian Liu.

> “God’s truth, Septimus, if there’s an equation for a curve like a bell, there must be an equation for a curve like a bluebell, and if a bluebell, why not a rose?”
>  
> --Thomasina in Stoppard’s *Arcadia* (1.3, p. 37)

> “the human mind actually consists of a multiplicity of processors which Daniel Dennett has elsewhere called ‘armies of idiots,’ each working on its own version of reality” (Harth, xxiii)

There is a nice anecdote about a popular talk given by Lord Rutherford, who had discovered the overwhelming emptiness of the atom around the turn of the century. When he described his model of the atom, a man in the audience objected saying that this theoretical idea was clearly refuted by the fact that walking into an iron beam was far from an experience of emptiness. Clearly, in such a case the beam is massively present, no matter what an atomic physicist may say. Rutherford’s answer was short and simple, something along the lines of “the reason, dear Sir, of your discomfort in walking into an iron beam stems from the fact that your head is even more empty than the iron beam!” (Piet Hut, “Structuring Reality: The Role of Limits” 152-53)
## Persistent Reality, 13

### Week 12: Uncertainty

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<td>Mon. 4/16</td>
<td>Patriots’ Day Holiday: no classes.</td>
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| Wed. 4/8   | Lao Tzu, *Tao Te Ching*, continued.  
             | Critical Reaction paper due on the *Tao* and reality (one page).  
             | Movie: *Colors of Infinity.*                                        |
| Fri. 4/20  | Fractal Dimensions.  
             | Burger & Starbird, “Between Dimensions: Can the Dimensions of  
             | Fractals Fall Through the Cracks?” Section 6.6, pp. 503-514.  
             | *Turbulent Mirror*, Prologue and Foreword, pp. 191-203 (student leaders). |

No more fiction: we calculate; but that we may calculate, we had to make fiction first.  
(Friedrich Nietzsche)

“What we call reality is an agreement that people have arrived at to make life more liveable.”  
(Louise Nevelson, Russo-American artist, 1900-1988)

“I did not know whether I was Chuang Tzu dreaming I was a butterfly;  
or a butterfly dreaming I was Chuang Tzu.”

“There are intangible realities which float near us, formless and without words; realities which no one has thought out, and which are excluded for lack of interpreters.”  
Natalie Clifford Barney (1876-1972, French Author)

### Week 13: Iteration

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| Mon. 4/23  | Julio Cortazar, “Blow-Up” (handout): we’ll begin this short story  
             | together, in class.  
             | (Michelangelo Antonioni’s pop-culture film,  
             | *Blowup* (1966) is *loosely* based on this short story and is well  
             | worth watching.)  
             | More on Fractals  
             | The Uncertainty Principle (maybe).                                   |
| Wed. 4/25  | Michael Frayn, *Copenhagen.*                                         |
| Thu. 4/26  | Michael Frayn, *Copenhagen.*  
             | Sensitive Dependence to Initial Conditions – Calculator Exercises.    |
| Fri. 4/27  | “Wasted days and wasted nights” (Freddie Fender).  

Not chaos like, together  
Crushed and bruised,  
But, as the world  
Harmoniously confused;  
Where order in variety we see,  
And where, though all things  
Differ, all agree.  
(Alexander Pope)
Week 14: Self-Similarity

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<tr>
<td>Wed. 5/2</td>
<td>TBA</td>
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| Fri. 5/4 *| Boyd, *Brazzaville Beach*, pp. 219 – 316.  
Critical Reaction paper due on *Brazzaville Beach* and reality (one page). |

> These our actors,  
> As I foretold you, were all spirits, and  
> Are melted into air, into thin air;  
> And like the baseless fabric of this vision,  
> We are such stuff  
> As dreams are made on; and our little life  
> Is rounded with a sleep.  
> (William Shakespeare)

> “Listen; there’s a hell of a universe next door: let’s go!”  
> (e.e. cummings)

If there is any primary rule of science, it is, in my opinion, acceptance of the obligation to acknowledge and describe all of reality, all that exists, everything that is the case. . . . At its best it is completely open and excludes nothing. It has no ‘entrance requirements.’ Maslow, 1966.

The second law of thermodynamics (simply stated, heat flows from hot to cold) predicts that the universe will reach a final state of thermodynamic equilibrium, or maximum entropy, at which time the universe will be dead. Indeed, if the universe has any purpose, it must end, for to continue on after reaching that purpose would be pointless. The ultimate irony is that the universe dies to make a point. James Baird, Woodstock, Georgia (qtd. in *Manchester Guardian Weekly*, November 1997).

According to Heisenberg, who struggled with the problem [Cartesian dualism] for many years, “This partition has penetrated deeply into the human mind during the three centuries following Descartes and it will take a long time for it to be replaced by a really different attitude toward the problem of reality.”

(qtd. Capra, *The Turning Point*, 60)

Week 15: Dreams

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| Mon. 5/7 *| Final papers and presentations due: no late papers will be accepted!  
The last word on reality. |
| Wed. 5/9 | Reading Day – no classes                                                |

> “Sometimes a cigar is just a cigar.” Sigmund Freud
Addenda to Reality:

Make-up day 1: Thursday, May 11 (eye shadow, liner, mascara, and eyebrows)
Make-up day 2: Friday, May 12 (lips and cheeks)

Final Exams: May 15-18

To see a world in a grain of sand,
And a heaven in a wildflower:
Hold infinity in the palm of your hand,
And eternity in an hour.

William Blake

Reality and Math
Reality and Art
Reality and the Senses
Reality and the Mind
Reality and Illusion
Reality and Dimension
Reality and Physics
Reality and Religion

Flatland:
1. Explain the significance of Abbott’s portrayal of women as lines. How does this shape demonstrate the role of women? If women are so silly and simple, why then are men so threatened by them? (Abbott seems to suggest some fear that Victorian men have toward women.)

2. Even though Flatland is written as a satire that is ridiculing Victorian attitudes, why is this book relevant to us today? Consider what aspects of human nature Abbott ridicules.

3. Discuss the parallels between A. Square’s experiences in Flatland and the man in Plato’s “Allegory of the Cave” as they pertain to acquiring knowledge and the sharing of it.


5. Discuss Abbott’s use of mathematics as a medium for social satire—characters are geometrical shapes who are only two dimensional and live in a very rigid class structure. Is this a world where empathy and compassion are valued or where the inhabitants are encouraged to learn and develop to their fullest potential?

6. One way to open our eyes to ideas otherwise invisible is through analogy, comparisons. In Flatland, Abbott has A. Square travel to different dimensions. What is Abbott trying to convey through A. Square’s experience? How by analogy can inhabitants of a three-dimensional world judge or understand the fourth dimension?