# CALIFORNIA INSTITUTE OF TECHNOLOGY Course Syllabus

H/HPS/VC 185 (History, History and Philosophy of Science, Visual Culture)
ANGELS AND MONSTERS: COSMOLOGY, ANTHROPOLOGY AND THE ENDS OF THE WORLD

9 units (3-0-6)

Tuesdays and Thursdays, 1:00-2:25 PM

Location: TBA

Instructor: Professor Nicolas Wey-Gomez

Office: Dabney 307 Phone: x 2560

Email: nwey@caltech.edu

Office Hours: Tu. and Tr. 11:00 AM-12:00 NOON

This course explores late medieval European understandings of the origins, structure, and workings of the cosmos in the realms of theology, physics, astronomy, astrology, magic, and medicine. Attention is given to the position of humans as cultural creatures at the intersection of nature and spirit; as well as to the place of Christian Europeans in relation to non-Christians and other categories of outsiders within and beyond Europe. We will particularly focus on the knowledge system that anticipated race theory, racial discrimination and imperialism in the modern western imagination.

We will ask what conceptual tools – scientific and technical – Christian Europeans had at their disposal for explaining differences in nature and culture during the early phases of imperial expansion we know today as the Age of Exploration. Particular attention will be given to those links between nature and culture that anticipated modern racial ideologies in the West: how did fifteenth-century Europeans come to think that the peoples they were encountering in Atlantic Africa and the Americas were 'by nature' inferior to them?

In the course of addressing these questions, we will first read cosmogonic works that explained the origins of humanity within a divinely fashioned cosmos (Book of Genesis, Hesiod's *Works and Days*, Plato's *Timaeus*). We will then move on to philosophical, medical, geographical and other works that explained differences among humans in terms of the structure and workings of the universe. In so far as nature was believed to account for individual, gender, class, national, and other differences, we will examine varying definitions of nature in the tradition leading from Antiquity to the Age of Exploration. Our discussion of nature will focus on the manner in which soul and body were thought to interact in humans and, thereby, on the manner in which uniquely human behavior was supposed to come about. What did the soul-body compact have to do with "order" and "disorder" in individuals, in society, and in society's relation to "barbarians"? On the subject of "barbarians," we will examine ancient and medieval debates concerning the

inhabitability and character of the tropics and the antipodes, debates of special relevance to the early history of European expansion.

Having addressed such questions, we will consider the various connections between nature and culture in a series of late medieval works leading into the Age of Exploration – the Hereford Map (1300), Roger Bacon's *Opus maius* (1266-1267), *The Travels of Marco Polo* (13th c. CE), and the letters of Christopher Columbus (1493-1504). Finally, we will reflect on the survival of such connections in contemporary media. In this vein, our course will end with a discussion of James Cameron's science fiction film *Avatar* (2009). Other readings include the Book of Genesis, Hesiod, Hippocrates, Plato, Aristotle, Pliny, St. Augustine, Macrobius, al-Kindī, Averröes, and Cuneo.

#### AI-FREE ZONE



All use of Al Tools (ChatGPT, Bard, Bing Chat, Claude2, etc.) is **STRICTLY FORBIDDEN**, except for the purpose of locating information or research on topics related to our class. This course is about your own individual, and irreplaceable, ability to read and interpret written and visual texts closely, as well as about your ability to put your insights about these materials into words. Reading is not just passive data-intake. You are problem-solving as you read. And writing is not just a medium to communicate with readers. It is about giving proper body to your ideas through words. You are problem-solving as you write.

### **REQUIRED VIEWING:**

James Cameron's Avatar. Twentieth Century-Fox Corp., 2009.

### **REQUIRED PRIMARY READINGS:**

Book of Genesis 1-11, King James translation.

\*Hesiod, Sel. Works and Days (ca. 700 BCE), ed. Tandy and Neal, Berkeley UP, 1997. PURCHASE:

https://www.amazon.com/dp/0520203844?cjdata=MXxOfDB8WXww&tag=ucpress0a&utm\_source=CommissionJunction &utm\_medium=Affiliate&utm\_campaign=8516542\_University+of+California+Press\_LD~External~Enterprise~MKTPLCE~ Other~National~Affiliate~www.amazon.com&utm\_content=~~EN&cjevent=bc14052b83e411ee83152a080a1cb829&test=123

Hippocratic, Sel. Airs, Waters and Places, selection (ca. 400 BCE)

Plato, Sel. from *Republic* IV, VI, VII, and IX; and *Laws* X (4th c. BCE)

\* Plato, Timaeus (4th c. BCE), trans. Peter Kalkavage, Focus, 2nd. ed. 2016. PURCHASE:

https://www.amazon.com/Timaeus-Focus-Philosophical-Library-

 $\underline{Plato/dp/1585107921/ref=sr\_1\_5?crid=DUD727YM3T2X\&keywords=plato+timaeus\&qid=1700073607\&s=books\&sprefix=plato+timaeus\&stripbooks\&sprefix=plato+timaeus\&stripbooks\&sprefix=plato+timaeus\&stripbooks\&sprefix=plato+timaeus\&stripbooks\&sprefix=plato+timaeus\&stripbooks\&sprefix=plato+timaeus\&stripbooks\&sprefix=plato+timaeus\&sprefix=pla$ 

Aristotle, Sel. from *Physics, On the Heavens, On Generation and Corruption, Meteorologica, On the Soul, Nicomachean Ethics, Politics* (4th c. BCE)

Pliny the Elder, Sel. from *Natural History* V and VI (1st c. CE)

Anonymous, Sel. from *Bestiary* (Ms. Bodley 764, 13th c. CE)

St. Augustine, Sel. from City of God (413-426 CE)

Macrobius, Sel. from Commentary on the Dream of Scipio (5th c. CE)

Averröes, Sel. from *Meteorologica* (12th c. CE)

Al-Kindī, Sel. from Stellar Rays (9th c. CE).

Roger Bacon, Sel. Opus maius IV (1266-1267)

\*Marco Polo, *Travels* (13th c. CE), Intro. Colin Thubron, Everyman's Library, 2008. Purchase:

https://www.amazon.com/Travels-Marco-

<u>Polo/dp/0307269132/ref=sr 1 6?crid=1TY29V4KJSLWS&keywords=marco+polo+travels&qid=170 1379718&s=books&sprefix=marco+polo+travels,stripbooks,190&sr=1-6</u>

Columbus, Letter to Santangel (1493)

Michele de Cuneo, Letter to Girolamo Annari (1495)

\* YOU ARE RESPONSIBLE FOR PURCHASING READINGS MARKED BY ASTERISKS. You may use <u>only</u> the supplied or indicated editions of these texts. Most required and recommended materials are on our **CANVAS** website or on reserve at the library. All maps can be found through the **MAP GALLERY** link on **CANVAS** (you must log in through Caltech **BOX**).

**IMPORTANT:** While you are welcome to download all available digital files to your computer, they are to be used only for this class. You may **NOT** print or circulate any map images. You may consult me about possible exceptions.

### **COURSE REQUIREMENTS:**

- 1. Participation (20% of final grade).
- 2. Short Paper, due Monday, 05 February (750-1000 words; 30%).
- 3. Midterm Take-Home Exam, due Friday, 09 February (20%).
- 4. Long Paper/PROJECT, due Monday, 11 March (1500-1750 words; 30%).

Although you may choose your final grade in this class to be "Pass" or "Fail," you will receive grades for individual requirements as part of my feedback on your performance. Each and all requirements – including participation – must be satisfactorily completed to merit a "Pass."

**PAPERS** must be well thought-out, neatly printed, double-spaced, and turned in on time in **MICROSOFT WORD format ONLY**. You must include source and page numbers for your citations, as well as a **BIBLIOGRAPHY** at the end (Chicago Manual of Style or MLA formats). You are encouraged to meet with me ahead of time to discuss topics and work in progress. **You are expected to turn in a complete draft for your First Paper**. With my feedback on that draft, you must then rewrite that draft into a final draft to be graded. Papers that receive a C (or lower) must be rewritten.

As part of our program to promote and support your writing skills, you should take full advantage of the resources offered by Caltech's Hixon Writing Center, which include feedback from writing specialists or peer tutors: <a href="http://www.writing.caltech.edu/">http://www.writing.caltech.edu/</a>.

**PARTICIPATION** entails active involvement in the discussion of the works: you should expect to be asked specific questions about readings and visual materials; you may be also be asked to prepare oral presentations or response papers about assigned readings; and you may be quizzed in class about the reading for that particular day. In order to facilitate class preparation and avoid too much reading in the middle of the week, you should prepare each week's reading ahead of time. More than *one* unexcused absence will automatically lower final grade at the rate of one letter grade per absence. If you get an F for participation, you will be in danger of failing the class. **Final grades of C (or lower) will ultimately be reported as a "Fail" on your transcript.** 

**IN-PERSON INSTRUCTION and ZOOM PROTOCOLS:** Lectures are an integral part of this course; they do not simply summarize assignments nor does web-based material substitute for attendance at lectures.

- 1. You must complete all assigned **READINGS IN ADVANCE OF CLASS SESSIONS**. You must have each **ASSIGNED READING IN FRONT OF YOU** for every class, whether in printed form or on your computer.
- You must ARRIVE ON TIME to our class sessions, and, if we switch to ZOOM, you are required to KEEP YOUR LIVE VIDEO OPEN AT ALL TIMES. Keep your MIC MUTED unless you are prepared to speak. NO RECORDING is allowed of class sessions.
- 3. You should expect to **TAKE NOTES** in class. While checking the web for information relevant to our class is permitted, all other surfing, or checking email and social media are discourteous, detrimental to your learning and will **NOT** be tolerated. **CELLPHONES ARE BANNED** from this class.

### **INSTITUTE POLICY:**

As Institute faculty, I am fully committed to promoting Caltech's core values — **diversity**, **equity**, **inclusion and accessibility**. This course adheres to Institute policy on nondiscrimination, harassment, and accommodations for disabilities. **If you require special accommodations**, **please talk to me as soon as possible.** This course also upholds Institute policy regarding the **honor code** and, more specifically, **plagiarism**. Written assignments in the humanities should reflect your individual engagement with class materials and discussions, specifying information and views that are not your own. If you have any doubts concerning your use of ideas or sources at any time, please ask me for advice.

By enrolling in this class, you automatically acknowledge that you have read, and abide by, the Hixon Writing Center's full guidelines and expectations on avoiding plagiarism (<a href="http://www.hss.caltech.edu/academics/avoiding-plagiarism">http://www.hss.caltech.edu/academics/avoiding-plagiarism</a>). You also acknowledge that you will not use AI Tools, except as specified by instructor.

### **SCHEDULE:**

### **JANUARY**

#### WEEK 1

TR 04	Introduction: Nature, Culture, and the Ends of the World
	1. Hereford Map (1300) (MAP GALLERY: MEDIEVAL MAPPAMUNDI)

## **Recommended Sources on the Hereford Map:**

- a. Scott D. Westrem, *The Hereford Map: A Transcription and Translation of the Legends with Commentary*. Brepols, 2001. [LIBRARY RESERVE: electronic resource]
- b. David Woodward, "Medieval Mappaemundi," in J. B. Harley and David Woodward, eds., Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean. The History of Cartography 1. Chicago, IL: The University of Chicago Press, 1987. [LIBRARY RESERVE]

### WEEK 2

	CULT	TURE'S BIG BANG THEORY AND THE CURSE OF HAM
TU 09	1.	Book of Genesis, chapters 1-4, 6-9, and 11
	2.	St. Augustine, Sel. from <i>The City of God against the Pagans</i> XVI, 1-6 (pp. 3-
		39), trans. Eva Matthews Sanford and William McAllen Green, pp
		Cambridge, MA: 1986
	3.	Hereford Map and other medieval maps
		(MAP GALLERY: MEDIEVAL MAPPAMUNDI)

## **Further Reading:**

- a. John Block Friedman, "Cain's Kin," chap. 5 in his *The Monstrous Races in Medieval Art and Thought*, pp. 87-107. Cambridge, MA: Harvard University Press, 19812.
- b. David Goldenberg, "Curse of Ham", chap. 12 in his *The Curse of Ham: Race and Slavery in early Judaism, Christianity, and Islam*, pp. 68-77). Princeton, NJ: Princeton University Press, 2003.

FROM GOLD TO IRON: THE AGES OF HUMAN KIND		
TR 11	1.	Selection from Hesiod, Works and Days (ca. 700 BCE)
		Lines 1-382

### WEEK 3

	THE	ELEMENTS AND THE HUMAN BODY
TU 16	1.	Hippocratic Airs, Waters and Places I-XXIV (ca. 400 BCE)
	2.	Nutton, Vivian, "Medicine in the Greek World, 800-50 BC," Intro. to <i>The</i>
		Western Medical Tradition 800 BC to AD 1800, Lawrence I. Conrad et al.,
		eds., pp. 1-38. Cambridge: Cambridge University Press, 1995.
	3.	Hippocrates, Diagram based on <i>The Nature of</i> Man

### **Further Reading:**

- a. G. E. R. Lloyd, "The Hot and the Cold, the Dry and the Wet in Greek Philosophy, *Journal of Hellenic Studies* 84 (1964), pp. 92-106.
- b. Jacques Jouanna, "The Birth of Western Medical Practice," chap. 2 in Western Medical Thought from Antiquity to the Middle Ages, ed. Mirko D. Grmek, 2-71, trans. Antony Shugaar, 2-71. Cambridge, MA: Harvard University Press, 1998.

	NATU	IRE AS SOUL: PLATO'S PHYSICS
TR18	1.	Plato, <i>Phaedrus</i> (245c-250c) and <i>Laws</i> X (896e-899c).
	2.	Plato, <i>Timaeus</i> , Preface and pp. 3-15

### WEEK 4

	PLAT	O'S COSMOGONY
TU 23	1.	Plato, <i>Timaeus</i> , pp. 19-45, and 84-88.

TR 25	NATU	JRE, ART, AND THE SOUL: ARISTOTLE'S PHYSICS AND PSYCHOLOGY
	1.	Aristotle, Sel. from <i>Physics</i> II, 1-3; IV, 1 and 4; <i>On the Heavens</i> IV, 3-4; I, 1-3;
		and On the Soul II, 1-3.
	2.	Nicolás Wey Gómez, selection from Chap. 4 of The Tropics of Empire: Why
		Columbus Sailed South to the Indies, 243-249. Cambridge, MA: The MIT
		Press, 2008.
	3.	Ailly FIGURE 1 ( <i>Online Folder</i> : Pierre d'Ailly YMAGO MUNDI 1483)

### **Further Reading:**

- a. R. J. Hankinson, "Science," chap. 5 in *The Cambridge Companion to Aristotle*, ed. Jonathan Barnes, pp. 140-167. Cambridge; New York, NY: Cambridge University Press, 1996.
- b. Stephen Everson, "Psychology," chap. 6 in *The Cambridge Companion to Aristotle*, pp. 168-194 (1996).

#### WEEK 5

<b>MON JANUARY 29</b>	- SHORT PAPER - FIRST DRAFT DUE	

## WEEK 5 (continued)

	ORD	ERLY SELVES, ORDERLY CITIES, AND WORLD ORDER: PLATO AND ARISTOTLE
TU 30	1.	Plato, <i>Republic</i> IV (427c-445e) and IX (588b-592b)
	2.	Aristotle, Sel. from Nicomachean Ethics II, 6 (1106b36-1107a8) and 8
		(1108b11-26)
	3.	Aristotle, Politics I, especially I, 5-6; and Politics VII, 7

## **Further Reading:**

a. C. C. W. Taylor, "Politics," chap. 8 in *The Cambridge Companion to Aristotle*, pp. 233-258 (1996).

### **FEBRUARY**

### Week 5 (continued)

week 5 (continued)		
	"TO\	YS FOR HERSELF AND MARVELS FOR US":
	THE	OUTER BOUNDARIES OF NATURE AND CULTURE
TR 01	1.	Pliny, Sel. from <i>Natural History</i> II, 64-80 (pp. 295-323); V, 8 [pp. 249-253]; VI,
		21-24 [pp379-409]; and VII, 1-2 [511-527].
	2.	Averröes, Sel. from <i>Meteorologica</i> .
	3.	ERATOSTHENES/PLINY (MAP GALLERY: ANCIENT WORLD MAPS)
		Hereford Map (1300) (MAP GALLERY MEDIEVAL MAPPAEMUNDI)
		Ailly FIGURE 4/Ailly FIGURE 5 (MAP GALLERY: Pierre d'Ailly YMAGO MUNDI)

### **Further Reading:**

- a. John Block Friedman, "The Plinian Races," Chap. 1 of his *The Monstrous Races in Medieval Art and Thought*, 5-25. Cambridge, MA: Harvard University Press, 1981.
- b. Alfred Hiatt, "The Antipodes in Antiquity," chap. 2 of *Terra Incognita: Mapping the Antipodes before 1600*, pp. 14-37. Chicago; London: The University of Chicago Press, 2008.

### WEEK 6

MONDAY, FEBRUARY 05	SHORT PAPER - FINAL DRAFT DUE
MONDAI, I EDNOARI 03	SHORT FALLY THAL BRAIT BOL

	PTOLEMY'S WORLD: A SCIENTIST MEASURES THE INHABITED WORLD
TU 06	<b>READING 1:</b> Selection from <i>Ptolemy's</i> Geography: An Annotated Translation of the
	Theoretical Chapters, ed. J. Lennart Berggren and Alexander Jones (Princeton:
	Princeton University Press, 2000), pp. 57-72 [chaps. 1-11]; pp. 82-84 [chaps. 20-22];
	pp. 85-93 [chap. 24].
	MAP GALLERY: PTOLEMY'S MAPS:
	Ptolemy's first projection (1477 [2 <sup>nd</sup> . c. CE])

Ptolemy's first projection (1478 [2<sup>nd</sup> c. CE])

Ptolemy's second projection (1482 [2<sup>nd</sup> c. CE])

Ptolemy's 1<sup>st</sup> Projection (Beggren and Jones)

Ptolemy's 2<sup>nd</sup> Projection (Beggren and Jones)

Ptolemy's Lybia (Beggren and Jones)

Ptolemy's India (Beggren and Jones)

Ptolemy's South Asia (Beggren and Jones)

### Further Reading:

**READING a:** Patrick Gautier Dalché, "The Reception of Ptolemy's *Geography* (End of the Fourteenth to Beginning of the Sixteenth Century," Chap. 9 in *Cartography in the European Renaissance*, ed. David Woodward, 285-364, The History of Cartography (Chicago: The University of Chicago Press, 2007).

**READING b:** Selection from Introduction to Beggren and Jones 2000, 3-17, 31-41.

# THE TORRID ZONE AND THE ANTIPODES: A DEBATE OVER THE EXTENT OF LAND AND LIFE AROUND THE GLOBE

TR 08

- 1. Macrobius, Sel. from *Commentary on the Dream of Scipio*, Bk. II, Chaps. 5 and 9
- 2. St. Augustine, *City of God against the Pagans* XVI, 7-9, pp. 39-53 (1986).
- 3. CRATES (MAP GALLERY: ANCIENT WORLD MAPS)
  MACROBIUS/ 8th c. (MAP GALLERY: MEDIEVAL MAPPAEMUNDI)
  Ailly FIGURE 7/Ailly FIGURE 7a (MAP GALLERY: Pierre d'Ailly YMAGO MUNDI)
  PTOLEMY MAPS

### **Further Reading:**

a. Alfred Hiatt, "Realignment: the Antipodes between Classicism and Christianity," chap. 3 of *Terra Incognita*, pp. 38-64 (2008).

### FRI FEBRUARY 09 — MIDTERM TAKE-HOME EXAM DUE

### WEEK 7

## THE BOOK OF NATURE: FROM NATURE AS "COPY" TO NATURE AS "EXAMPLE"

## TU 13

- 1. Sel. from Plato, *Republic* VI and VII (508a-b and 514a-517c, respectively)
- 2. Macrobius, Sel. from *Commentary on the Dream of Scipio*, Bk. I, Chaps. 8, 14, and 22

### **Further Reading:**

- a. St. Augustine, City of God against the Pagans XXI. 1-10, pp. 3-69 (1986)
- b. Sel. from the Anonymous *Bestiary* (The Lion, The Dragon, The Basilisk)

# LIGHT, MAGIC, AND CAUSATION IN THE NATURAL WORLD: A HANDBOOK FOR THE OCCULT SCIENCES

TR 15

1. Sel. from Al-Kindī, *Stellar Rays* (Chapters 1, 2, 3, 5 and 6)

### **Further Reading:**

a. David C. Lindberg, "Historical Background to Bacon's Doctrine of the Multiplication of Species," pp. xxxv-liiii of his Introduction to *Roger Bacon's Philosophy of Nature*, ed. David C. Lindberg, South Bend, IN: St. Augustine's Press, 1998.

### WEEK 8

### ROGER BACON AND THE ENDS OF THE WORLD

**TU 20** 

1. Selection from Roger Bacon, *Opus maius* IV (SCIENCE OF THE STARS, 128-129; OPTICS, 131-136; INHABITED WORLD, 153-160; ASTROLOGY AND GEOGRAPHY, 270-275; LAND AND LIFE ON GLOBE, 310-315 and 320-321; ETHIOPIA, 331-332; INDIA, 371-372; TARTARS, 384-389.

### **Further Reading:**

- a. David C. Lindberg, "The Transmission of Greek and Arabic Learning to the West," in *Science in the Middle Ages*, ed. David C. Lindberg, 52-90. Chicago; London: The University of Chicago Press, 1978.1.
- b. Jeremiah Hackett, "Roger Bacon on Astronomy-Astrology: The Sources of the *Scientia Experimentalis*," chap. 8 in *Roger Bacon and the Sciences:*Commemorative Essays, ed. Jeremiah Hackett, 174-198. Leiden; New York: Köln: Brill 1997.
- c. David Woodward and Herbert M. Howe, "Roger Bacon on Geography and Cartography," in *Roger Bacon and the Sciences*, pp. 199-222 (1997)
- d. David C. Lindberg, "The Medieval Church Encounters the Classical Tradition: Saint Augustine, Roger Bacon, and the Handmaiden Metaphor," chap. 1 in When Science and Christianity Meet, ed. David C. Lindberg and Ronald L. Numbers, pp. 7-32. Chicago: The University Press of Chicago, 2003.
- e. E. Randolph Daniel, "Joachim of Fiore: Patterns of History in the Apocalypse," chap. 5 in *The Apocalypse in the Middle Ages*, ed. Richard K. Emmerson and Bernard McGinn, 72-88. Ithaca, NY; London: Cornell University Press, 1992.

### TR 22 TOURISTS OF THE MIDDLE AGES

- 1. Marco Polo, Sel. from *Travels of Marco Polo*, 13th c., pp. ix-xvii, 13-30, 209-224, and 230-286 (online)
- 2. HEREFORD MAP (1300) /EBSTORF MAP (1300) (MAP GALLERY: MEDIEVAL MAPPAEMUNDI)

### **Further Reading:**

a. Lorraine Daston and Katharine Park, "At the Limit" and "The Topography of Wonder," Introduction and Chapter One of their *Wonders and the Order of Nature* 1150-1750, pp. 13-20 and 21-66, respectively. New York, NY: Zone Books, 1998.

### WEEK 9

TU 27	MARTIN BEHAIM'S GLOBE (1492)
	1. MARTIN BEHAIM'S GLOBE 1492 (MAP GALLERY: MARTIN BEHAIM'S GLOBE)

a. E. G. Ravenstein, "Nomenclature and Commentary," in his *Martin Behaim: His Life and His Globe*, pp. 71-105. London: George Philip and Sons, 1908

	EUROPE'S ENCOUNTER OF THE AMERICAS				
TR 29	1.	Christopher Columbus, Letter to Luis de Santángel (1493)			
	2.	Capitulations of Santa Fé (1492)			
	3.	voyage1_main/voyage1inset (MAP GALLERY: COLUMBUS'S ROUTES)			
	4.	Nicolás Wey Gómez, "The Tropics of Empire"			

### **Further Reading:**

a. Christopher Columbus, Letter of the Third Voyage (1498)

### **MARCH**

### Week 10

A TAXONOMY OF AMERINDIAN NATURE AND CULTURE				
TU 05	1.	Michel de Cuneo, Letter to Girolamo Annari (1495)		
	2.	voyage2_main/voyage3inset (MAP GALLERY: COLUMBUS'S ROUTES)		

AVATARS IN CONTEMPORARY CULTURE				
TR 07	1.	Cameron's Avatar (2009)		

### **Further Reading:**

a. Dave Itzkoff, "You Saw What in 'Avatar'? Pass Those Glasses!"

(http://www.nytimes.com/2010/01/20/movies/20avatar.html?emc=eta1)

### Study Period and Finals Week

## MONDAY MARCH 11— LONG PAPER/PROJECT DUE