

Anth 305: Advanced topics in biological anthropology

A new human species

Spring 2017



Photo © National Geographic

Professor: Zachary Cofran
Meetings: Blodgett Hall 101, M 3:10-6:10 pm
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Lab: Blodgett 030
Office hours: Thursday 2-4 pm, or by appointment

Course Description

The 2013 discovery of the extinct species *Homo naledi* in South Africa was remarkable for a number of reasons: it is unclear how the species' bones ended up deep within a large cave system; the sheer volume of human fossils recovered is matched only by a few sites that have been excavated for decades; data from the discovery, in the form of 3D surface renderings of the fossils, were made publically available at the same time as the species was announced, setting a new standard in open access science. As with most major discoveries, the *Homo naledi* project has been controversial, with some outsiders claiming the all-women excavation team was a publicity stunt, and many experts skeptical of the claim that the small-brained *Homo naledi* intentionally disposed of its dead. In this course, students are introduced to both the science and social saga behind *Homo naledi*, examining the geological and anatomical evidence of the life and death of our newest fossil relative. Directly comparing the *Homo naledi* fossils with living and extinct humans, students reconstruct this animal for themselves. Examining the controversies surrounding *Homo naledi*, we reveal the human side of science that is often under appreciated.

Objectives

- Learn to set up a testable research question
- Collect anatomical data in order to test a hypothesis
- Gain expertise in musculo-skeletal anatomy
- Communicate about fossils and evolution to non-specialists

Textbooks & Readings

Aiello and Dean. 1990. *An Introduction to Human Evolutionary Anatomy*. New York: Academic Press

In addition to this book, weekly readings are posted to Moodle. The Aiello and Dean book is largely supplemental, whereas the posted Moodle readings will be most fundamental for in-class work. All readings should be completed for the week in which they are posted/assigned before coming to class.

Grading

Participation = 15%

You must attend class and participate in discussions and activities (see “Attendance Policy”). Breakdown: Missing more than one session = 0%, Attending 12+ sessions but inactive = 5%, Attending 12+ sessions but moderately active = 10%, Attending all sessions and always active (note that ‘active’ does not mean dominating discussions and activities) = 15%.

#FossilFriday = 5%

Using Twitter, on Fridays you will show and tell the world something interesting about a published *Homo naledi* specimen, including a picture, in 125 characters or less (140 minus the #fossilfriday tag). The purpose of this assignment is to practice extremely concise writing and dissemination of paleontological data. Only published specimens are eligible, and students must write about different specimens.

Lab notebook = 20%

Understanding fossils and anatomy requires spending time poring over specimens. Each week there will be in-class activities and assignments facilitating this, and you will be required to draw and label specimens in the lab notebook provided to you. You will not be graded on your artistic skills, but rather each drawing session will help you become familiar with skeletal anatomy.

Digitization = 10%

You will generate new 3D data by digitizing a human bone in the Anthropology Department’s osteology collection. You will write a brief comparison of your digitized model and the original bone. Due no later than 12 April.

Project = 50%

Your course project will be an original study in which you address a research question relating to *Homo naledi*, gather and analyze data to test a hypothesis, and write up the results in the style of an article for [American Journal of Physical Anthropology](#). This cumulative project involves several parts:

- Brainstorming meeting (5%)

- Before the end of week 4 you must meet with me to discuss potential topics.
- Project proposal (5%)
Before investing completely in a research project, you must write a brief (<2 pages) proposal including the following: 1) research question(s), 2) significance statement, 3) data that address the research question and where the data will come from, 4) specific hypothesis/-es to be tested, 5) potential method(s) to analyze data and the test hypothesis.
Due by 03 March.
 - Presentation (15%)
You will present your preliminary findings to the class at the end of the semester, and I will provide any last comments and suggestions for your write-up. Talks will be in the style of podium presentations at the annual meetings of the American Association of Physical Anthropologists, lasting for 15 minutes each with time for questions after. Presentations will be the last week of class.
 - Write-up / final paper (25%)
You will present your research in a ~10 page paper, which must be uploaded to Moodle no later than 16 May. A 100-200 word abstract must be included but does not contribute to the ~10 pages.

There will be no opportunities for extra credit.

Attendance

We will only meet 13 times over the semester, so you must attend each meeting. You are allowed one free absence (which includes missing at least half a session), with no explanation needed. Exceptions to this rule can only be made with appropriate documentation from Health Services or the Dean of Students.

Assignment submission and late work policy

I expect you to submit your work in a timely manner, as directed on assignment prompts. Late work will be reduced by 10% for each day that it is late. The only time I will accept late work without penalty is if it is accompanied by documentation from Health Services or the Dean of Students.

Disabilities

If you require special accommodation because of a disability or condition, you must make sure this is documented with the Office of Accessibility and Educational Opportunity, and notify me before the accommodation is required (i.e. not on the day of an exam).

Academic Integrity

All work you submit must be your own. You may discuss assignments with colleagues, but you may not turn in the same work. When you use references, other people's ideas, and especially other people's direct words, you absolutely must cite them. For more information, see page 133 of the Vassar College Regulations (<http://bit.ly/2bMuogv>) and "Going to the Source" (<http://bit.ly/2bMuNQ8>). Plagiarism and other academic misconduct will result in a grade of 0 on the assignment and referral to the College's Academic Panel.

Technology

Turn your phones off (or at least put on silent) when you come to class. I can and will confiscate phones if I find them distracting. Phones may only be used in class to access course materials (e.g., readings). You may take notes on a computer if you wish, however, if you become distracting to myself or other students I will confiscate the computer for the duration of class as well. I reserve the right to ban all technology from the classroom at any point in the semester.

Schedule of topics, readings & assignments*

* Schedule and content subject to change at professor's discretion.

AD # = Aiello and Dean chapter(s)

Week 1 (25 January): No meeting

Film: *Dawn of Humanity* – <http://www.pbs.org/video/2365559270/>

Week 2 (30 January): Hello *naledi*

Readings

- Berger et al. 2015. *Homo naledi*, a new species of the genus *Homo* from the Dinaledi Chamber, South Africa. *eLife* 4:e09560.
- Stringer 2015. The many mysteries of *Homo naledi*. *eLife* 4:e10627.
- Hawks 2016. The latest on *Homo naledi*. *American Scientist* 104: 198. <http://bit.ly/2k6iEYO>
- McKie 2015. Scientist who found new human species accused of playing fast and loose with the truth. *The Guardian* <http://bit.ly/2k6l6yD>
- Rothkopf 2015. UK paper suggests all-female archaeology team was a 'publicity stunt.' *Jezebel* <http://bit.ly/2k6ivVj>

Week 3 (6 February): Head over heels

Readings

- Laird et al. in press. The skull of *Homo naledi*. *Journal of Human Evolution*.
- Schroeder et al. in press. Skull diversity in the *Homo* lineage and the relative position of *Homo naledi*. *Journal of Human Evolution*.
- TBD (probably Antón et al. 2007. "Defining *Homo erectus*: Size considered.")
- AD 4-6

Week 4 (13 February): Outside bones

Readings

- Deleuzene et al. 2014 draft. "The dentition of *Homo naledi*."
- Evans et al. 2016. A simple rule governs the evolution and development of hominin tooth size. *Nature* 530: 477–481.
- AD 7-8

Week 5 (20 February): In your head (Zombie -ie -ie)

Readings

- Grabowski et al. 2016. Evolutionary modeling and correcting for observation error support a 3/5 brain-body allometry for primates. *Journal of Human Evolution* 94: 106–116.
- Falk 2015. Interpreting sulci on hominin endocasts: Old hypotheses and new findings. *Frontiers in Neuroscience* doi.org/10.3389/fnhum.2014.00134.
- AD 9-10

Week 6 (27 February): Call to arms

Readings

- Feuerriegel et al. in press. The upper limb of *Homo naledi*. *Journal of Human Evolution*.

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- Ruff et al. 2016. Limb bone structural proportions and locomotor behavior in A.L. 288-1 (“Lucy”). *PLoS One* 11: e0166095.
- AD 16-17

Week 7 (06 March): Hand before time

- Kivell et al. 2015. The hand of *Homo naledi*. *Nature Communications* 6: 8431.
- Marzke 2013. Tool making, hand morphology and fossil hominins. *Philosophical Transactions of the Royal Society B*. 368: 20120414.
- AD 18

*** Spring Break 13–24 March ***

Week 8 (27 March): Spine vs. spine

Readings

- Williams et al. in press. The thorax of *Homo naledi*. *Journal of Human Evolution*
- Van Sickle et al. draft. Pelvic remains of *Homo naledi*, from Dinaledi, South Africa. *Journal of Human Evolution*.
- AD 14-15 & 20

Week 9 (03 April): Too leg-it to quit

Readings

- Marchi et al. in press. Thigh and leg of *Homo naledi*. *Journal of Human Evolution*.
- AD 19, 21-22.

Week 10 (10 April): Foot

Digitization assignment write-up due 12 April

Readings

- Harcourt-Smith et al. 2015. The foot of *Homo naledi*. *Nature Communications* 6: 8432.
- AD 23

Week 11 (17 April): New species on the block?

AAPA Conference – no office hours

Readings

- Dembo et al. 2016. The evolutionary relationships and age of *Homo naledi*: An assessment using dated Bayesian phylogenetic methods. *Journal of Human Evolution* 97: 17–26.
- Hawks 2005. “Species Concepts.” John Hawks Weblog. <http://bit.ly/2td9Rpk>
- Leakey et al. 1964. A new species of the genus *Homo* from Olduvai Gorge. *Nature* 202: 7–9.
- Aiello 2010. Five years of *Homo floresiensis*. *American Journal of Physical Anthropology* 142: 167–179.

Week 12 (24 April): Geological contexts

Readings

- Geological and taphonomic context for the new hominin species *Homo naledi* from the Dinaledi Chamber, South Africa. *eLife* 4:e09561.

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- Val 2016. Deliberate body disposal by hominins in the Dinaledi Chamber, Cradle of Humankind, South Africa? *Journal of Human Evolution* 96:145-148.
- Dirks et al. 2016. Comment on “Deliberate body disposal by hominins in the Dinaledi Chamber, Cradle of Humankind, South Africa?” *Journal of Human Evolution* 96:149–153.

Week 13 (01 May): American Museum of Natural History
Sunday 31 April

Week 14 (08 May): Presentations

Finals week (17-23 May)
Term paper due 16 May