

# EART 191B: Planetary Capstone

TuTh 1:30-3:05 E&MS D258

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Office hours: Tues & Thurs 3:05-4:05 or by appt.

**Course Goals:** To provide students with an opportunity to synthesize their knowledge across different planetary science disciplines by presenting a written and oral report on a cross-cutting topic. This year's topic is Planetary Volcanism.

**Textbook:** Not required, although Lopes & Gregg, *Volcanic Worlds*, Springer-Praxis, 2010 is on reserve.

**Approximate Grading Scheme:**

25% Outline report (due week 4)

20% Final oral presentation (week 10)

55% Final written report (week 10)

**Prerequisites:**

EART160 is a prerequisite, and EART111 or MATH22.

**Plagiarism:**

In writing a review paper it is especially important to avoid plagiarism. I expect the reports to be written in the students' own words; any duplication of more than 50% of a sentence appearing in a published abstract or paper should be identified via quote marks and appropriately referenced.

**Disability:**

If you qualify for classroom accommodations because of a disability, please get an Accommodation Authorization from the Disability Resource Center (DRC) and submit it to me in person outside of class (e.g. office hour) within the **first two weeks** of the quarter. Contact DRC at [\(831\) 459-2089](tel:8314592089).

**Course Outline**

Week 1 (April 3): Introduction & report topics; reading a paper

Week 2 (April 10): Interiors (1); writing a paper

Week 3 (April 17): Interiors (2); oral presentations of topic paper

Week 4 (April 24): Surfaces (1); writing a review paper

Week 5 (May 1): Surfaces (2); oral presentations of topic

Week 6 (May 8): Surfaces (3); how papers get published

Week 7 (May 15): Atmospheres (1); TBD

Week 8 (May 22): Atmospheres (2); when things go wrong

Week 9 (May 29): NO CLASS (report writing)

Week 10 (June 5): Oral presentations

**Suggested report topics:**

Are there currently active volcanoes on Venus?

Smrekar et al., *Science* 328, 605-608, 2010.

How important is volcanism for heat transfer on planetary bodies?

Moore and Webb, *Nature* 501, 501-505, 2013.

Does Io really have a magma ocean?

Khurana et al., *Science* 332, 1186-1189, 2011.

How different is volcanism on Venus to volcanism on Earth?

Turcotte, *JGR Planets* 101, 4765-4773, 1996.

Are there “supervolcanoes” on Mars?

Michalski & Bleacher, *Nature* 502, 47ff, 2013.

What is the history of volcanism on Mercury?

Johnson & Hauck, *JGR Planets* 121, 2319-2362, 2016.

What is the evidence for cryovolcanism on Titan?

Moore & Pappalardo, *Icarus* 212, 790-806, 2011.

What is the evidence for cryovolcanism in the outer solar system?

Chapter 9 of Lopes and Gregg (though this was written before Enceladus!)

Was the climate of Mars influenced by volcanic activity?

Halevy & Head, *Nature Geosci.* 7, 865-868, 2014.

Was the climate of Earth influenced by volcanic activity?

Robock, *Rev. Geophys.* 38, 191-219, 2000.

Are mass extinctions on Earth caused by volcanic eruptions?

Bryan & Ferrari, *GSA Bull.* 125, 1053-1078, 2013