

G446 / 546 Meteorites

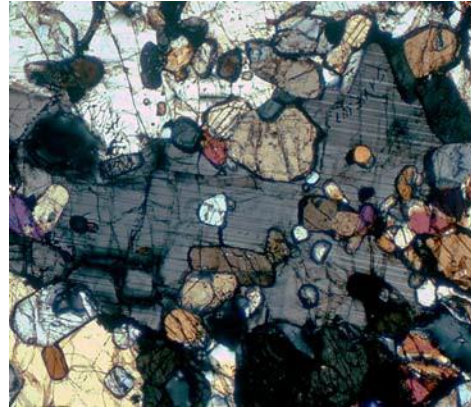
Winter 2024

CRN 44178 (446)

CRN 44180 (546)

Location: Portland State University
Lecture MW 14:00-15:50
Room CH 69

Instructor: Dr. Alex Ruzicka
CH 46, 503-725-3372
e-mail: ruzickaa@pdx.edu
Office Hours: By Arrangement



Class website: <http://web.pdx.edu/~ruzickaa/meteorites>

Course Description: In this seminar-style course, students will learn about meteorites and the stories they tell us about the birth and evolution of the solar system. Learning will be accomplished primarily through class discussions and readings of recent scientific articles. Topics will include meteorite classification, asteroids, chondritic and differentiated meteorites, the solar nebula, extinct radionuclide chronology, the processes and consequences of heating asteroidal bodies, pre-solar grains, abiotic synthesis of organic matter, impact and collisional processes, and meteorites from the Moon and Mars.

Text: There is no text for this course, but there will be readings consisting of published papers. Most readings are available freely over the internet and links to these have been provided in the Reading List placed on-line. Other reading material will be accessible via Canvas at <https://canvas.pdx.edu> following PSU login to ODIN. (The Canvas site will contain PDFs of *all* the papers.) These readings are required.

Class readings: An essential component of this class will involve reading and thinking about the reading materials. These have been selected to provide a relatively comprehensive survey of meteorite-related topics. They will form the basis for class discussions, homework assignments, and exams (see below). Unlike most text materials for classes, these readings rely on peer-reviewed published articles, written by scientists for others. The instructor will help students to understand and critically analyze the articles. A copy of the reading list with links will be provided on the class website.

Exams: There will be one **mid-term exam** and a **Final**. These exams will be short answer. No make-up exams will be given except for a medical emergency or unless arrangements to take the test at another time are made with the instructor in advance. The Final (held Wednesday, Mar 20, 12:30-14:20) will be comprehensive. Questions from the mid-term exam may be re-used on the Final. Exams may be curved. Answers and score distributions for the exams will be posted on the class website.

Homework: Homework assignments will be built around the class readings. They will be due at the start of class the day that the associated class readings are due. They will NOT be accepted late. However, they can be submitted to the instructor in different ways: as hardcopy in class or in the instructor's mailbox in the Geology Department, or electronically by e-mail sent to the instructor. A check system will be used to grade homework. Here is how the check system will work: 0 points = not turned in or turned in late; check = 2 points = homework turned in on time and satisfactory; check-plus = 3 points = homework turned in on time and exemplary; check-minus = 1 point = homework turned in on time but less than satisfactory. Homework assignments will be posted on the class website.

Class attendance and class participation: To encourage participation in class discussions, students will be graded partly on attendance, and partly on their additional participation in class activities. Neither of

these can be “made up”. Class attendance will be determined purely by the number of class meetings attended by a student, whereas class participation will be determined by the contribution that a student makes to discussions in class.

Grades: Grading is done on a straight scale although curves will be used at my discretion. Grades will be assigned based on scores as follows: 95% or above = A, 90-94.99% = A-, 87-89.99% = B+, 83-86.99% = B, 80-82.99% = B-, 77-79.99% = C+, 73-76.99% = C, 70-72.99% = C-, 67-69.99% = D+, 63-66.99% = D, 60-62.99% = D-, less than 60% = F. I generally do not give “I” grades. Letter grades will correspond to the standards given in the PSU course catalog.

Grade distribution:

Class attendance..... 10%
 Class discussion..... 20%
 Homework..... 30%
 Mid-term Exam..... 15%
 Final exam..... 25%

Other policies: (a) If you feel you have a disability and need an accommodation, contact the Disability Resource Center (drc@pdx.edu, 503-725-4150, 116 Smith). (b) It is the responsibility of the student to arrange makeup tests at the SHAC testing center (testing@pdx.edu, UCB Suite 340) and to work with the instructor so that mutually acceptable times can be arranged. (c) Each student is responsible for all of the content of all of the classes. (d) A culture of professionalism and mutual respect is expected. Any incident of discrimination or discriminatory harassment, including sexual harassment, can be reported to the [Office of Equity and Compliance](#), or the [Office of the Dean of Student Life](#). For resources, see <http://www.pdx.edu/sexual-assault/get-help>. (e) Students who do not turn in a completed Syllabus Acknowledgment form may be withdrawn.

Class schedule for topics & reading due dates (see separate reading list for identification of articles*, class website for any updates):

Week	Monday	Friday
1	1/8– Introduction (lecture)	1/12– <i>Overview 1 (HW1 due)</i>
2	1/15– MLK Holiday, NO CLASS	1/19– <i>Asteroid-meteorite connection 1&2 (HW2,3 due)</i>
3	1/22– <i>Chondrules & CAIs 1 (HW4 due)</i>	1/26-- <i>Chondrules & CAIs 2,3 (HW5, 6 due)</i>
4	1/29– <i>Volatility & metal fractionation in solar nebula 1 (HW7 due)</i> ; Lab & rock demos	2/2-- <i>Volatility & metal fractionation in solar nebula 2 (HW8 due)</i> ; Review for mid-term
5	2/5— Mid-term Exam	2/9-- <i>Early timescales 1&2 (HW9,10 due)</i>
6	2/12-- <i>Metamorphism and water 1 (HW11 due)</i>	2/16– <i>Metamorphism & water 2 (HW 12 due)</i> ; Stellar life cycles & nucleosynthesis (lecture)
7	2/19– <i>Pre-solar grains 1 (HW13 due)</i>	2/23– <i>Organic matter in meteorites 1 (HW14 due)</i>
8	2/26– <i>Differentiation 1 (HW15 due)</i>	3/1– <i>Differentiation 2 (HW16 due)</i>
9	3/4– <i>Thermal models 1 (HW17 due)</i>	3/8– <i>Impacts & collisions 1 & 2 (HW18, 19 due)</i>
10	3/11– <i>Martian meteorites 1 (HW20 due) & Lunar meteorites 1 (HW21 due)</i>	3/15– Review

*Italicized items include readings and associated homework (HW).

