ASTR 255: Introduction to Planetary Science

Class Meetings
January-April 2019
11:00-12:20 Wednesdays and Fridays, Clearihue D130

Instructor
Dr. Samantha Lawler: lawler@uvic.ca
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Office hours: Wednesday 9:30–10:30 or by appointment

Textbook
The textbook is recommended but not required, I will supplement this with portions of other textbooks. An ebook version of the textbook is available to students through the UVic library. Much of the course material will be available through CourseSpaces.

Evaluation
20% problem sets
20% midterm exam (in class, Friday Feb. 15)
25% final exam
25% term project (3% term paper draft, 15% term paper, 7% presentation)
10% class participation assignments

Course Outline
Planetary science is an incredibly broad field. The topics we cover in this course will be primarily driven by discussions of a few scientifically important published journal articles:

• No Universal Minimum-Mass Extrasolar Nebula (Raymond & Cossou 2014). Planet formation theories, planetary migration in disks, radiation, blackbody equation, orbital evolution of dust.

• Melting of Io by Tidal Dissipation (Peale et al. 1979). Tides, tidal evolution of orbits, tidal disruption, tidal energy and dissipation.

• 67P/Churyumov-Gerasimenko, a Jupiter Family Comet with a High D/H Ratio (Altwegg et al. 2014). Meteorites, impacts and cratering, minerals, isotopes, radioisotopes and dating rocks.

• Origin of the Late Heavy Bombardment Period of the Terrestrial Planets (Gomes et al. 2005). Late Heavy Bombardment, planet migration, Solar System architecture.

• The Occurrence and Mass Distribution of Close-in Super-Earths, Neptunes, and Jupiters (Howard et al. 2010). Exoplanet detection techniques, properties and types of known exoplanets, detection biases.


• OSSOS. VI. Striking Biases in the Detection of Large Semimajor Axis Trans-Neptunian Objects (Shankman et al. 2017). Keplerian orbits revisited, Planet 9, surveys.