Seminar Planetary Science - The Moon (3 credits, online only)

This class includes 1-hour virtual class meeting during the week with additional literature to be read and 1-1.5 hours of lecture material/scientific talks to be watched online during the week prior to the class.

Instructors: Dr. Gross and Dr. Bermingham

The Moon forms a fundamental baseline for our understanding of the origin of planets and their early evolution, in terms of core and mantle formation and evolution, magnetism, impact basin formation and evolution, and global tectonics. Specifically, the lunar anorthositic crust is the most well-studied stagnant lid in the solar system and the model of its formation via plagioclase flotation in the lunar magma ocean has become a cornerstone for understanding crust formation on terrestrial planets and asteroids. Major goals of this course include getting an overview of lunar science, learning about lunar evolution from different scientific perspectives (data-, model, and exploration-driven), and discussing outstanding questions as well as scientific and exploration goals for future robotic and human exploration missions to the Moon.

The course will be offered virtually and will involve the exchange of scholarly information in a small group setting to promote discussion within the group. Recorded online lectures and scientific talks given by different lunar experts, as well as lunar scientific literature will be reviewed during the week by students prior to the class and then be critically discussed in class. Students will be expected to lead and participate in the group, this includes student-led presentations and assessment of lunar literature. This course is intended for graduate students.

Preliminary syllabus/themes (assuming 14 weeks per this semester):

1. History of lunar exploration
2. Giant Impact/Moon-Earth forming event
3. Lunar Magma Ocean
4. Crater counting/relative ages
5. Impact crater/absolute dating
6. Lunar crust - Lunar Samples and their significance
7. Geophysical models/lunar interior
8. Lunar Volcanism
9. Thermal evolution and magnetism of the Moon:
10. Lunar Regolith
11. Volatiles and poles
12. Remote sensing/Global assessment
13. Apollo Next Generation Sample Analyses (ANGSA) initiative and the future missions
14. Next steps in lunar exploration