

Fall 2021
PTYS 595B - Ices of the Solar System.
Tuesdays 2:00 - 2:50 pm in Kuiper 309 (temporarily Kuiper 301)

Instructor

Jack Holt, Professor, Lunar and Planetary Laboratory and Dept. of Geosciences

Office: Kuiper 432. Hours by appointment, or virtual meetings may be scheduled.

Stefano Nerozzi, Postdoctoral Scholar, Lunar and Planetary Laboratory, will be assisting with the course.

Office: Kuiper 519C. Hours by appointment, or virtual meetings may be scheduled

Course Description

In this 1-unit course we will explore the origins, characteristics, and evolution of ices across the Solar System. Ranging across planets, moons, and comets, we will learn how the presence of ices and their features relate to the history of each body, how the cryosphere interacts with atmosphere and subsurface, and the implications for habitability. We will begin with the inner Solar System and work outward. Mercury, the Moon, then Earth, Mars, small bodies, icy moons, and finally the Kuiper belt, with a possible discussion of exoplanets.

Course Prerequisites or Co-requisites

There are no course prerequisites.

Course Format and Teaching Methods

Course Modality – In-person. The format will be reading and discussing scientific papers, students will participate in choosing papers, leading discussions, and reviewing missions that have provided key data.

- Meeting schedule and logistics:
 - In-person: Tuesdays 2-2:50 pm, Kuiper 301 until 309 is available.
- Classroom attendance:
 - If you feel sick, or may have been in contact with someone who is infectious, stay home. Except for seeking medical care, avoid contact with others and do not travel.
 - Notify your instructor(s) if you will be missing a course meeting or an assignment deadline.
 - Non-attendance for any reason does not guarantee an automatic extension of due date or rescheduling of examinations/assessments.
 - Please communicate and coordinate any request directly with your instructor.
 - If you must miss the equivalent of more than one week of class, you should contact the Dean of Students Office DOS-deanofstudents@email.arizona.edu to share documentation about the challenges you are facing.
 - Voluntary, free, and convenient COVID-19 testing is available for students on Main Campus.
 - COVID-19 vaccine is available for all students at Campus Health.
 - Visit the UArizona COVID-19 page for regular updates.

As we enter the Fall semester, the health and wellbeing of everyone in this class is the highest priority. Accordingly, we are all required to follow the university guidelines on COVID-19 mitigation. Please visit www.covid19.arizona.edu for the latest guidance.

Course Objectives

Course objectives are to familiarize the students with the general state of knowledge regarding ice in our solar system – its origin, distribution, implications for life, and the general methods by which it is studied.

Expected Learning Outcomes

At the conclusion of the course, the students will have the ability to read scientific papers, analyze their content, perform critical thinking skills, present summaries to others, lead discussions, and demonstrate their analytical skills through writing summaries and critiques of each paper.

Required Texts and Materials

No required texts or materials.

Schedule of Topics and Activities

The table below lists the dates and topics that will be discussed. Specific papers to be discussed for each topic will be chosen and assigned weekly with the participation of the class.

Date	Topic
Aug 31	Ices at the formation of the Solar System
Sep 7	Mars - south polar "lakes"
Sep 14	Mars - spiral troughs and the WRAP
Sep 21	Mars - glaciers and LDM/plains ice
Sep 28	small bodies - Vesta/Ceres
Oct 5	small bodies - comets and asteroids
Oct 12	Moon
Oct 19	Mercury
Oct 26	ocean worlds - Europa
Nov 2	ocean worlds - Enceladus
Nov 9	Pluto
Nov 16	Other Kuiper belt objects
Nov 23	Earth - ice sheets, glaciers, orbital forcing
Nov 30	Earth - Snowball Earth
Dec 7	TBD - class choice or makeup

Assessments

Assessment will be based on participation, presentations, and written assignments. Presentations include leading the class discussion for a particular paper. There will be no quizzes or tests.

Assessment Categories	Percentage of final grade
Attendance and participation in class activities	30%
Presentations	40%
Written assignments	30%
Total	100%

Final Examination or Project

There is no final examination or project.

Grading Scale and Policies

This class uses standard ABCDE grades. Final letter grades will be assigned as follows:

- A: 90% or higher
- B: 80 – 89%
- C: 70 – 79%
- D: 60 – 69%
- E: Below 60%

Requests for incomplete (I) or withdrawal (W) must be made in accordance with University policies, which are available at <http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete> and <http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal> respectively.

Nondiscrimination and Anti-harassment Policy

The University of Arizona is committed to creating and maintaining an environment free of discrimination. In support of this commitment, the University prohibits discrimination, including harassment and retaliation, based on a protected classification, including race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, or genetic information. For more information, including how to report a concern, please see: <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

University Policies

All university policies related to a syllabus are available at: <https://academicaffairs.arizona.edu/syllabus-policies>. By placing this link in your syllabus, you no longer need to have each individual policy included in your syllabus.

Subject to Change Notice

Information contained in the course syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor of this course.

Graduate Student Resources

Academic advising: If you have questions about your academic progress this semester, please reach out to your academic advisor (<https://advising.arizona.edu/advisors/major>). Contact the Advising Resource Center (<https://advising.arizona.edu/>) for all general advising questions and referral assistance. Call 520-626-8667 or email to advising@arizona.edu

Life challenges: If you are experiencing unexpected barriers to your success in your courses, please note the Dean of Students Office is a central support resource for all students and may be helpful. The [Dean of Students Office](#) can be reached at (520) 621-2057 or DOS-deanofstudents@email.arizona.edu.

Physical and mental-health challenges: If you are facing physical or mental health challenges this semester, please note that Campus Health provides quality medical and mental health care. For medical appointments, call (520) 621-9202. For After Hours care, call (520) 570-7898. For the Counseling & Psych Services (CAPS) 24/7 hotline, call (520) 621-3334.

Also Please see the University of Arizona's Basic Needs Resources page: <http://basicneeds.arizona.edu/index.html>