Physics of Planets (EAS 4370/6370)  
Georgia Institute of Technology  
Mon/Wed 3:00-4:15 pm in ES&T L1175  
Instructor: James Wray – jwray@gatech.edu

Course Description
In this course we will study the forces and influences that determine the composition, structure and evolution of the planets in our solar system. The keys to understanding solar system formation and evolution reside in observable planetary characteristics and those inferred from theory and indirect observation. This understanding has evolved over the last several hundred years as telescope technology and space travel have enhanced our ability to make sophisticated measurements of much of the solar system. Students will gain an overall understanding of the physics governing the orbits, surfaces, subsurfaces, atmospheres and magnetospheres of the planets and planetary systems (moons and rings). These concepts will be placed in the context of current formation/evolution theories, and related open science question will be discussed in terms of potential spacecraft missions.

Topics Covered
Solar System Overview  
Orbital Dynamics  
Energy Transport  
Atmospheric Properties  
Planetary Surfaces  
Planetary Interiors  
Physics of Magnetospheres  
Planetary Formation  
Astrobiology

Required Text
Planetary Sciences, Updated 2nd Edition, by Imke de Pater and Jack J. Lissauer

Grading/Assessment
There will be roughly 6 graded homework assignments, and weekly reading assignments to support the lectures. Homework sets will be due at the beginning of class. Late assignments will be deducted 20% if turned in by the following class day, but will not be given credit after that unless exceptional circumstances are demonstrated. While you are both allowed and encouraged to work together on the homework assignments, you must turn in your own original work, and you will be responsible for individually understanding the material. There will be one midterm and one final exam (equally weighted), and a final project consisting of a research term paper and an oral presentation. The course grading breakdown is as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Homework problem sets:</td>
<td>30%</td>
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<tr>
<td>Exams (equally weighted):</td>
<td>35%</td>
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<td>Final Project:</td>
<td>30%</td>
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<tr>
<td>Class Participation:</td>
<td>5%</td>
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Office Hours
Weekly office hours occur at 9:30–11am Mondays, or by appointment, in ES&T 2234.
Statement of Intent for Inclusivity
As a member of the Georgia Tech community, I am committed to creating a learning environment in which all of my students feel safe and included. Because we are individuals with varying needs, I am reliant on your feedback to achieve this goal. To that end, I invite you to enter into dialogue with me about the things I can stop, start, and continue doing to make my classroom an environment in which every student feels valued and can engage actively in our learning community.

Support Services and Resources
In your time at Georgia Tech, you may find yourself in need of support. Below you will find some resources to support you both as a student and as a person.

Academic Support
- Center for Academic Success
  - 1-to-1 tutoring
  - Peer-Led Undergraduate Study (PLUS)
  - Academic coaching
- Residence Life’s Learning Assistance Program
  Drop-in tutoring for many 1000-level courses
- OMED Educational Services - Group study sessions and tutoring programs
- Communication Center - Individualized help with writing and multimedia projects
- Academic advisors for your major

Personal Support
Georgia Tech Resources
- The Office of the Dean of Students | 404-894-6367 | 2nd floor, Smithgall Student Services Building; You also may request assistance here
- Counseling Center | 404-894-2575 | Smithgall Student Services Building 2nd floor
  - Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources.
  - Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at 404-894-2204.
- Students’ Temporary Assistance and Resources (STAR)
  - Can assist with interview clothing, food, and housing needs.
- Stamps Health Services | 404-894-1420
  - Primary care, pharmacy, women’s health, psychiatry, immunization and allergy, health promotion, and nutrition
- OMED Educational Services | 404-894-3959
- Women’s Resource Center | 404-385-0230
- LGBTQIA Resource Center | 404-385-4780
- Veteran’s Resource Center | 404-385-2067
- Georgia Tech Police | 404-894-2500

National Resources:
- The National Suicide Prevention Lifeline | 1-800-273-8255
  - Free and confidential support 24/7 to those in suicidal or emotional distress
- The Trevor Project
  - Crisis intervention and suicide prevention support to members of the LGBTQ+ community and their friends
  - Telephone | 1-866-488-7386 | 24 hours a day, 7 days a week
  - Online chat | 24 hours a day, 7 days a week
  - Text message | Text “START” to 687687 | 24hrs day, 7 days a week