

Physics 523: Galaxies

Spring 2017

(Tentatively) MWF 9:00-9:53 - [To be discussed in first class](#)

(Tentatively) Frey Hall 112 - [To be discussed in first class](#)

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Office hours: Wed. and Fri., 10:00-11:30AM; Stop by my office anytime.

Course Description: This course introduces observational and theoretical studies of galaxies, and discusses the classification, property, structure, dynamics, stability, and evolution of galaxies. Details are in the schedule below.

Textbooks:

Primary:

1. "Galaxy Formation and Evolution", by Mo, van den Bosch, and White

Secondary:

2. "Galactic Astronomy", by Binney and Merrifield
3. "Galactic Dynamics", by Binney and Tremaine
4. "Galaxies in the Universe: An introduction", by Sparke and Gallagher
5. "Galaxy Formation and Evolution", by Mo, van den Bosch, and White

Course Grading: Homeworks (1/3), take-home midterm examination (1/3), and take-home final examination (1/3). Students are encouraged to discuss homework problems and questions with other students, but everyone must work out his or her own solutions or answers, and turn in a personal write-up.

Important University Policies:

Americans with Disabilities Act: If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Academic Integrity: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including

categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>

Critical Incident Management: Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.

Special Note Regarding Plagiarism and Dishonesty: All instances of plagiarized work or academic dishonesty will be brought before the Academic Judiciary Committee. All parties involved (both the copier and the person who produced the original work) will be held accountable for any instance of plagiarism or dishonesty.

PHY 523 "Galaxies" Schedule (tentative)

Week	Date	Topic	Chapters
1		Introduction: Overview Astronomical Measurements	
2		The Milky Way Galaxy: Structures and Components Kinematics and Dynamics	
3		The Milky Way Galaxy: Face-on View Gas Recycling Formation of the Milky Way	
4		Spiral Galaxies: Observation Summary Stellar and Gas Orbits	
5		Spiral Galaxies: Spiral Structure and Disk Stability Density Wave Theory & Self-Perpetuating Spirals	
6		Elliptical Galaxies: Observational Summary Relaxation	
7		Elliptical Galaxies: Stellar Hydrodynamics Mass Profile and Dark Matter	
8		Spring Break	
9		Local Group: Review: Stellar Evolution Chemical Evolution	
10		Local Group: Dwarf Galaxies Galactic Archeology	
11		Galaxies in the Universe: Statistical Properties Hierarchical Galaxy Formation Press-Schechter formalism	
12		Cluster of galaxies: Morphology-Density Relation X-ray Halo & Dark Matter	
13		Active Galactic Nuclei: Active Galactic Nuclei & Seyfert galaxies Jet & Outflows Black Hole – Bulge Relation Center of the Milky Way	
14		Galaxy Evolution: Chemical & Photometric Evolution Cooling Diagram and Morphology	
15		Galaxy Evolution: Dynamical Interaction of galaxies Models of galaxy formation	