

PHY 523 — Galaxies  
SYLLABUS

**Instructor:** K. M. Lanzetta

**Office:** 456 Earth and Space Sciences

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**Course description:** This course provides an introduction to galaxies and the interstellar medium. Topics include galaxy morphologies, stellar luminosity function, galactic chemical evolution, age/metallicity relationship, globular clusters, dynamics of collisionless systems, galaxy kinematics, Oort constants, cosmic distance scale, interstellar absorption lines, interstellar emission lines, 21 cm hyperfine transition, dispersion and rotation measures, interstellar dust, bremsstrahlung, X-ray emitting plasmas, neutral and atomic Hydrogen content of galaxies, active galaxies and QSOs, QSO absorption lines, intergalactic medium, cosmic chemical evolution, photometric redshift measurements, high-redshift galaxies, and galaxy formation and evolution.

**Texts:** The optional texts for the course are *Galactic Dynamics* by James Binney and Scott Tremaine (1987, Princeton University Press), *Galactic Astronomy* by James Binney and Michael Merrifield (1998, Princeton University Press), and *Galaxy Formation* by Houjun Mo, Frank van den Bosch, and Simon White (2010, Cambridge University Press). Other text books may be made available at the reserve section of the library.

**Grades:** Grades will be based on homework (25%), two mid-term examinations (25% each), and a final examination (25%).

**Numerical analysis:** Some of the homework assignments will require numerical analysis, which can be reasonably carried out only on a computer. Some basic computer skills (i.e. familiarity with a computer language or a numerical analysis package) are required to complete these assignments. *See me immediately if this is a problem.*

**Important notice:** If you have any condition, such as a physical or mental disability, which will make it difficult for you to carry out the work as outlined above or which will require extra time on examinations, please notify me in the first two weeks of the course so that we may make appropriate arrangements.