Physics 241C. Extragalactic Astrophysics. Winter 2009.

Lecture Topics and Reading List

1. Structure, morphology, and content of nearby galaxies.

   Briefly review Binney & Merrifield, Ch. 4

   Freeman, K. C. 1970, ApJ, 160, 811
   On the Disks of Spiral and S0 Galaxies

2. Basic interstellar medium 1.

   Binney & Merrifield, Ch. 8.1
   Supplemental: Osterbrock, Ch. 2

   Rand, R. J., Kulkarni, S. R., & Rice, W. 1992, ApJ, 390, 66
   Star Formation and the Distribution of HI and Infrared Emission in M51

3. Basic interstellar medium 2.

   Toomre, A. 1964, ApJ, 139, 1217
   On the gravitational stability of a disk of stars

4. Star formation and molecular clouds.

   Binney & Merrifield, Ch. 8.2.0-3

   Kennicutt, R. C. 1989, ApJ, 344, 685
   The Star Formation Law in Galactic Disks

5. Dust.

   Binney & Merrifield, Ch. 3.7

   Calzetti, D., Kinney, A. L., & Storchi-Bergmann, T. 1994, ApJ, 429, 582
   Dust Extinction of the Stellar Continua in Starburst Galaxies: The Ultraviolet and Optical Extinction Law

6. Stellar populations of galaxies and spectral synthesis modeling.

   Binney & Merrifield, Ch. 5.1

   Kennicutt, R. C., Jr. 1998, ARA&A, 36, 189
   Star Formation in Galaxies Along the Hubble Sequence

   Bruzual, G., & Charlot, S. 2003, MNRAS, 344, 1000
   Stellar Population Synthesis at the Resolution of 2003

7. Galaxy metallicities: diagnostics and results.

Binney & Merrifield, Ch. 5.2-3

Zaritsky, D., Kennicutt, R. C., & Huchra, J. P. 1994, ApJ, 420, 87
HII Regions and the Abundance Properties of Spiral Galaxies

8. Recent results on the properties of galaxies 1.

   Kennicutt, R. C., Jr., et al. 2007, ApJ, 671, 333
   Star formation in NGC 5194 (M51a). II. The Spatially Resolved Star Formation Law

9. Recent results on the properties of galaxies 2.

   Faber, S. M., et al. 2007, ApJ, 665, 265
   Galaxy Luminosity Functions to z ~ 1 from DEEP2 and COMBO-17: Implications for Red Galaxy Formation

10. Galaxy rotation curves and their implications for dark matter.

    Binney & Merrifield, Ch. 11
    Binney & Tremaine, Ch. 10.1

    Johnston, K. V., Zhao, H., Spergel, D. N., & Hernquist, L. 1999, ApJ, 512, 109
    Tidal Streams as Probes of the Galactic Potential

    Rubin, V. C., Ford, W. K., Jr., & Thonnard, N. 1978, ApJ, 255, L107
    Extended Rotation Curves of High-Luminosity Spiral Galaxies. IV.Systematic Dynamical Properties, Sa-Sc

11. Scaling relations: Tully-Fisher, Faber-Jackson, and the Fundamental Plane.

    Tully, R. B., & Fisher, J. R. 1997, A&A, 54, 661
    A New Method of Determining Distances to Galaxies

12. Dynamical friction; the impulse approximation; tidal forces.

    Binney & Tremaine, 7.0-3

    Toomre, A. R., & Toomre, J. 1972, ApJ, 178, 623
    Galactic Bridges and Tails

13. Clustering phenomenology: pairs, groups, clusters of galaxies, and large-scale structure.

    Larson, R. B., & Tinsley, B. M. 1978, ApJ, 219, 46
    Star Formation Rates in Normal and Peculiar Galaxies

    Dressler, A. 1980, ApJ, 236, 351
    Galaxy Morphology in Rich Clusters – Implications for the Formation and Evolution of Galaxies

14. Clustering statistics.

Binney & Tremaine, Ch. 10.2

De Lapparent, V., Geller, M. J., & Huchra, J. P. 1986, ApJ, 302 1
A Slice of the Universe

15. Active galactic nuclei: basics.

    Greenstein, J. L., & Schmidt, M. 1964, ApJ, 140, 1
    The Quasi-Stellar Radio Sources 3C48 and 3C273

16. Active galactic nuclei: properties and "uses"; black holes in inactive galaxies.

    Kormendy, J. & Richstone, D. 1995, 33, 581
    Inward Bound – The Search for Supermassive Black Holes in Galactic Nuclei

17. The Intergalactic Medium; reionization; probes of the IGM.

    Gunn, J.E., & Peterson, B. A. 1965, ApJ, 142, 1633
    On the Density of Neutral Hydrogen in Intergalactic Space

18. Galaxy formation.

    White, S. D. M., & Rees, M. J. 1978, MNRAS, 183, 341
    Core Condensation in Heavy Halos – A Two-Stage Theory for Galaxy Formation and Clustering

19. Galaxy properties as a function of redshift; the high-redshift frontier.

    Steidel, C. C., Giavalisco, M., Pettini, M., Dickinson, M., & Adelberger, K. L. 1996, ApJ, 462, L17
    Spectroscopic Confirmation of a Population of Normal Star-Forming Galaxies at Redshifts z > 3