Syllabus for ASTR 6300:

Radio Astronomy

Fall 2024

Last update: September 2, 2024

Lectures:	Thursdays 14:20 – 17:10 in 501, 2nd General Building		
Website:	http://orion.astr.nthu.edu.tw/ra/		
Instructor:	Huei-Ru Vivien Chen (陳惠茹)	Office:	513, 2nd General Building
Email:	hchen@phys.nthu.edu.tw	Office hour:	Wednesday 10:30–11:30

Handouts:
Lecture slides are available *on the course website*.

References:
Tools of Radio Astronomy (6th edition) by T. L. Wilson, K. Rohlfs, & S. Hüttemeister, Springer 2013 (ISBN: 9783642399497; electronic version available on campus)

Galactic and Extragalactic Radio Astronomy (2nd edition) by G. L. Verschuur & K. I. Kellermann (editors), Springer-Verlag 1988 (ISBN: 0387965750; out of print)

Synthesis Imaging in Radio Astronomy II edited by G. B. Taylor, C. L. Carilli, & R. A. Perley 1999, ASPC, 180; available on SAO/NASA ADS

Interferometry and Synthesis in Radio Astronomy (2nd edition) by A. R. Thompson, J. M. Moran, & G. W. Swenson, Wiley 2001 (ISBN: 0471254924; electronic version available on campus)

Observational Astrophysics (3rd edition) by P. Léna, D. Rouan, F. Lebrun, F. Mignard, & D. Pelat, Springer 2008 (ISBN: 9783642218149; electronic version available on campus)

Grading policy:
70% problem sets and 30% final examination.
Problem sets are due 5 PM on the Monday after next unless otherwise instructed. *No late problems will be accepted without a valid excuse approved by the instructor prior to the deadline.*

Course outline:
Total 14 lectures with a holiday on October 10, final exam on December 19.

1. Introduction to radio astronomy
2. The nature of radio signals
3. Spectral line fundamentals
4. Astrophysical phenomena in the radio waveband
   (a) Galactic radio continuum sources
   (b) Radio line emission sources
   (c) Extragalactic radio sources
5. Signal processing and receiving systems
6. Atmospheric effects
7. Observing strategies I: single-aperture telescopes
8. Observing strategies II: interferometers and aperture synthesis