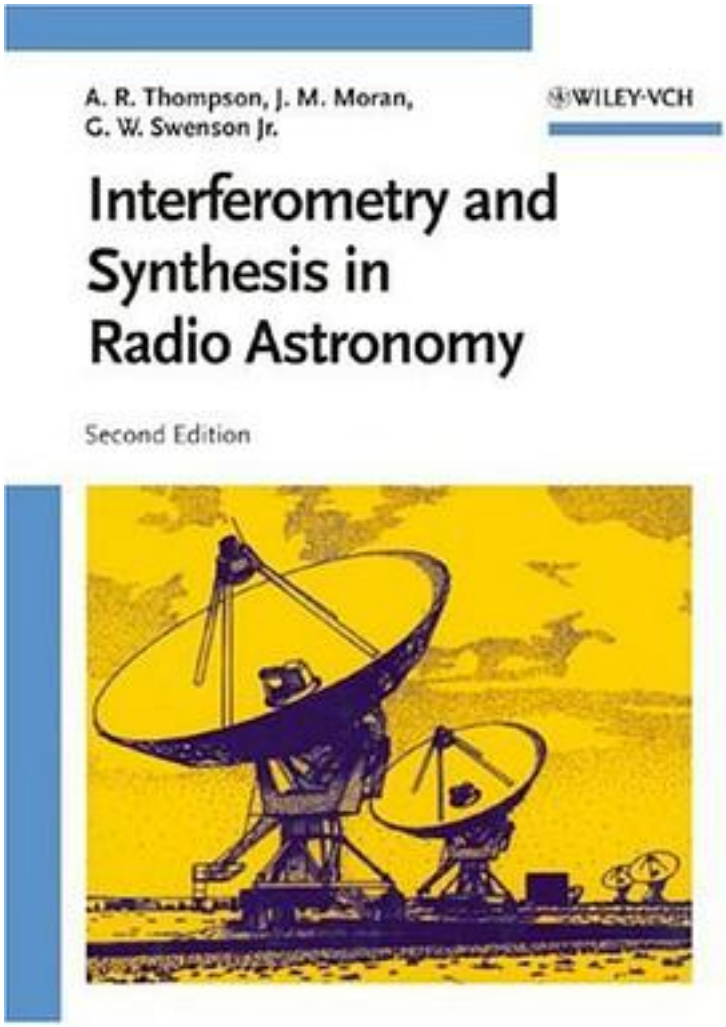
Interferometry and Synthesis in Radio Astronomy



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Comprehensive, authoritative coverage of interferometric techniques for radio

astronomy In this Second Edition of Interferometry and Synthesis in Radio Astronomy , three leading figures in the development of large imaging arrays, including very-long-baseline interferometry (VLBI), describe and explain the technology that provides images of the universe with an angular resolution as fine as 1/20,000 of an arcsecond. This comprehensive volume begins with a historical review followed by detailed coverage of the theory of interferometry and synthesis imaging, analysis of interferometer response, geometrical relationships, polarimetry, antennas, and arrays. Discussion of the receiving system continues with analysis of the response to signals and noise, analog design requirements, and digital signal processing. The authors detail special requirements of VLBI including atomic frequency standards, broadband recording systems, and antennas in orbit. Further major topics include: Calibration of data and synthesis of images Image enhancement using nonlinear algorithms Techniques for astrometry and geodesy Propagation in the neutral atmosphere and ionized media Radio interference Related techniques: intensity interferometry, moon occultations, antenna holography, and optical interferometry Interferometry and Synthesis in Radio Astronomy, Second Edition is comprehensive in that it provides an excellent overview of most radio astronomical instrumentation and techniques.

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