COURSE ANNOUNCEMENT: FALL 2001

ACS 597B: Nonlinear Acoustics

This course will introduce nonlinear acoustics, the study of loud sound waves for which linear acoustics is not applicable. Interesting in its own right, nonlinear acoustics also is pertinent in many areas including noise control, biomedical ultrasound, underwater acoustics, aeroacoustics, thermoacoustics, and in the enhancement of industrial processes.

Topics to be covered:
- Review of thermoviscous linear sound
- Nonlinear equations of acoustics
- Steepening/harmonic generation
- Weak shocks/N-waves
- Burgers’ equation
- Sonic booms
- Acoustic saturation
- Radiation pressure
- Acoustic levitation
- Nonlinear reflections and standing waves
- Streaming (significantly updated for 2001!)
- Cavitation and sonoluminescence
- Parametric arrays and the “audio spotlight”
- Scattering of sound by sound
- Computational nonlinear acoustics

Prerequisites: ACS 502, 510, or instructor consent.


Class meetings: Tuesday/Thursday, 11:15 AM – 12:30 PM, 214 Applied Science Building, Sched. No. 823326, 3 cr.

Credit or Audit: Credit grades are calculated from homeworks, a class presentation, and midterm and final exams. Audit grades are based only on class attendance.

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