

Lectures on Imaging in Random Media

George Papanicolaou

Monday, May 12, 2008

- **Lecture I** –Introduction and overview
- **Lecture II** - Least squares and migration imaging. Basic resolution theory
- **Afternoon Formal Discussion Session - Chrysoula Tsogka:** An overview of computational results with migration imaging and introduction to computational issues

Tuesday, May 13, 2008

- **Lecture III** - Resolution theory, use of the Kirchhoff-Helmholtz identities
- **Lecture IV** - Noise sources and correlations. Open media and cavities. Velocity estimation and imaging with distributed sensors
- **Afternoon Formal Discussion Session - Chrysoula Tsogka:** Computational issues in array imaging

Wednesday, May 14, 2008

- **Lecture V** - Use of the SVD in detection and imaging
- **Lecture VI** - Edge illumination, the Fraunhofer regime and inverse filters
- **Afternoon Formal Discussion Session - Liliana Borcea:** Imaging with layer annihilation

Thursday, May 15, 2008

- **Lecture VII** - Waves in random media: layered media, the paraxial approximation, radiative transport
- **Lecture VIII** - Time reversal in random media, superresolution, statistical stability
- **Afternoon Formal Discussion Session - Josselin Garnier:** Passive sensor imaging with cross correlations

Friday, May 16, 2008

- **Lecture IX** - Coherent interferometry for imaging in random media.
- **Lecture X** - Discussion of research problems: Time reversal, imaging, random media, simulations, communications, optimization and adaptivity