Lecture Week No. 2

Experimental Lectures	Lecture 6: Squeezed States of Light **Schnabel**	Lecture 7: Thermal Noise **Danzmann**	Lecture 8: Quantum Noise in GW Detectors **Schnabel**	Lecture 9: Thermal Noise **Danzmann**	Lecture 10: Introduction to Optomechanics **Hammerer**	Lecture 11: Macroscopic Tests of Quantum Mechanics **Aspelmeyer**
General Relativity	Lecture 6: Linearized theory, action on detect **Schutz**	Lecture 7: Generation of GWs in linearized theory **Schutz**	Lecture 8: Black holes Ⅰ **Schutz**	Lecture 9: Black holes Ⅱ **Schutz**	Lecture 10: Spherical stars **Schutz**	
Data Analysis	Lecture 6: - Probability as extended logic *Cox's desiderata *The 3 laws of probability *Bayes' theorem - worked example: estimating the "bias of a coin" **Prix**	Lecture 7: - Hypothesis testing *Bayes factor, posterior odds *Classical framework: Neyman-Pearson optimality *Neyman-Pearson lemma **Prix**	Lecture 8: -'Build your own coalescing binary search' -Discrete Fourier transform -CBC chirp signal in time and frequency domain -Matched filter for CBC signals -Horizon distance **Dent**	Lecture 9: - Application: Detecting signals in noise *simple vs composite hypotheses *Bayesian marginalization vs maximum-likelihood methods *generalized Neyman-Pearson theorem *[parameter estimation] **Prix**	Lecture 10: -Matches, template banks and coincidence testing -Non-Gaussian noise: signal consistency tests -Data quality vetoes -Background estimation -Inference on astrophysical rates **Dent**	