Roundtable remarks

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LIGO-G020093-00-Z

Detection as a statistical process

- The goal of data analysis is to distinguish between “signals” and “noise”
  - » One person’s signal is another’s noise:cf. LISA and CWDBs
- Measurement noise can only be characterized statisticallly
  - » Mean, variance, correlations, etc.
- *What data analysts need* are *characteristic features* of sought-for signals
  - » These are used to distinguish between signal & noise
  - » E.g., gamma-ray bursts immediately following grav-wave burst, energy spectrum of collapse vs. coalescence, characteristic cross-correlation between two separated detectors
  - » Much broader than “waveforms”

Things that go “bump” in the night

“There are more things in heaven and earth, Horatio, then are dreamt of in your philosophy”

Seek and ye shall find - but what?

- Need analysis methods that are not tied to a specific source, or class of sources
  - » General physical principles? Impulsive excitation, frequency, damping time
- Detection involves distinguishing signal, noise
  - » “Signal from noise” or “noise from signal”?
  - » Exploit the noise model!
  - » Example: associating grav-waves with γ-ray bursts relies as much on properties of noise (it is uncorrelated btwn detectors) as on signal

Beyond detection

- Detection is a milestone on the gravitational wave astronomy highway
  - » We *will* pass it … and leave it behind
- Interpretation - *what we do with observations* - is where the science is
  - » Not just detection: also upper limits that constrain theory

- What is needed for a successful interpretation program?
  - » Tools
    - – Simulation software, theoretical tools (e.g., Feynman diagrams!)
    - – And facility in their use
  - » Intuition
    - – Requires broad experience playing with tools
  - » Knowledge
    - – What are the theories, models, musings, etc., relevant to grav-waves and their sources
  - » Observations!