

Gravitational Wave - Electromagnetic follow-up with UK facilities

University of Warwick

14 August 2013

Aims

- Expected timescales for directional GW detection, and likely GW sources.
- Science gains from electromagnetic counterparts.
- Expected electromagnetic properties of likely GW sources (lifetimes, brightness, wavelength).
- What current or future facilities might the UK use to maximize science return from GW triggers?
- How should we co-ordinate this work as a community?

Programme

- 10:10 Gravitational Wave Astronomy (Martin Hendry)
- 10:40 Localization of GW sources (Stephen Fairhurst)
- 11:00 EM counterparts (Darren White – Sheffield)
- 11:20 Coffee
- 11:50 **DISCUSSION** – EM properties of GW sources
- LUNCH
- 14:00 High Energy Follow-up (Julian Osborne/Paul O’Brien - Leicester)
- 14:15 ATLAS (Stephen Smartt / Alan Fitzsimmons - QUB)
- 14:30 Liverpool Telescope (Chris Copperwheat - JMU)
- 14:45 GOTO (Don Pollacco – Warwick)
- 15:00 Coffee
- 15:20 Other science from new facilities (Solar system, SNe, rare transients)
- 16:00 **DISCUSSION** – Optimizing follow-up and UK leadership

Discussion questions 1

- Rates of bursts vs inspirals?
- Prompt optical properties. GRB afterglow models OK, or need to allow for beaming?
- Kilonova (or your favourite name). How bright, how long?
- How many unrelated transients do we expect in a GW error box? Can we snapshot identify (colours, high cadence etc)?
- Imaging vs spectroscopy. How faint? How fast?

Discussion questions 2

- Should new facilities be GW dedicated? Are the rates high enough? Should they be multi-purpose?
- How do EM detections impact GW rates
 - Best to narrow down in trigger time, or location?
 - Is high energy better for this than optical? How much more does it cost?
- Geographical coverage.
 - Is a northern/southern split OK or do we want 24/7 coverage for fast transients?
 - Where are the best places to be (purely for GW)? How might this evolve?
- How can the UK lead?
- Should we organize as a single umbrella (particle physics/LIGO route) or as individual (but co-operating) groups?