

HST LIGO Follow-up Working Group

Optimising Hubble observations of gravitational wave optical counterparts

Context

The recent discovery of an optical counterpart to the binary neutron-star merger, GW/GRB170817A, has opened a new window in astrophysics. That discovery spawned numerous follow-up observations with both ground- and space-based facilities, including two Director's Discretionary time requests and the triggering of five Target of Opportunity proposals. The observations were submitted as stand-alone programs, rather than a coordinated campaign, leaving the program balance and relative prioritization a task for observatory staff. The confidential nature of the discovery presented further complications. In the event, the observations were generally successful, but a greater degree of preparation would have been useful.

Looking forward, LIGO is expected to resume operations in late 2018/early 2019 at which time it will issue Open Public Alerts for vetted candidates. At the same time, there is growing interest on astronomical transients with the on-going Pan-STARRS survey, the initiation of the Zwicky Transient Factory (ZTF) and the eventual implementation of the Large Synoptic Survey Telescope (LSST). The increased focus is likely to lead to correspondingly increased requests for follow-up observations with Hubble. The present working group has been established to better prepare STScI to deal with future high profile discoveries.

Charge

The working group is charged with advising the STScI director on options for maximizing the scientific impact of future HST observations of optical counterparts to gravitational wave sources. The working group may also consider appropriate response to other types of optical transients. The topics covered should include

- Broad guidelines to establish criteria to define when observations with Hubble are justified for a given transient source
- Prioritisation of the types of follow-up observations most appropriately carried out by Hubble
- Guidelines on ground-based vs space-based observations
- Guidelines for community access to Hubble data

The working group should also consider whether it is possible to design a suite of Target of Opportunity (ToO) community programs that could be activated rapidly in response to an appropriate set of criteria.

Constituted

May 2018

Membership

Chair: Raffaella Margutti (Northwestern University)

Members: Brad Cenko (GSFC), Ben Farr (Oregon), Ori Fox (STScI), Erik Kuulkers (ESA-XMM), Emily Levesque (Washington), Danny Milisavljevic (Purdue)

Outcome

[Report](#) submitted to the Director

[HST Rapid Response](#) white paper - summarises the technical constraints involved in scheduling rapid turnaround HST observations.

[STUC presentation](#), November 2018

[Instrument Science Report on Ultra-Rapid ToOs](#)