

Using ISS telescopes for electromagnetic follow-up of gravitational wave detections of NS-NS and NS-BH mergers

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Abstract The International Space Station offers a unique platform for rapid and inexpensive deployment of space telescopes. A scientific opportunity of great potential later this decade is the use of telescopes for the electromagnetic follow-up of ground-based gravitational wave detections of neutron star and black hole mergers. We describe this possibility for OpTIIX, an ISS technology demonstration of a 1.5 m diffraction limited optical telescope assembled in space, and ISS-Lobster, a wide-field imaging X-ray telescope now under study as a potential NASA mission. Both telescopes will be mounted on pointing platforms, allowing rapid positioning to the source of a gravitational wave event. Electromagnetic follow-up rates of several per year appear likely, offering a wealth of complementary science on the mergers of black holes and neutron stars.

Keywords Gravitational waves · Gamma-ray bursts

1 Introduction

The ISS has recently completed its construction activities and is now moving into its period of utilization, providing space payloads with a long-term, stable platform.¹ Its large solar arrays and Ku-band antennas provide the ISS with power and data capabilities which are capable of supporting multiple payloads. The result is that scientific payloads can be attached to the ISS without need-

¹http://www.nasa.gov/mission_pages/station/research/benefits

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