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Towards a new approach to cosmology with the Dark Energy Survey and Gravitational Waves

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Motivated by the exciting prospect of new wealth of information that will arise from observations of gravitational and electromagnetic radiation from the same astrophysical phenomena, we have established a program to search for optical counterparts to LIGO/Virgo events using the the Dark Energy Camera (DECam). The project is performed in a broad collaboration including members of the Dark Energy Survey (DES) Collaboration, the LIGO/Virgo Collaboration, and the community at large. Its success has motivated us to pursue a new survey with DECam: the Blanco Images of the Southern Sky (BLISS) survey. BLISS expands the DECam sky coverage beyond the areas covered by DES and will increase the efficiency of our searches. In this talk, I present an overview of this effort, including results of searches for signatures of the first two binary black hole mergers detected by LIGO in the 2015-2016 observing campaign and status of the ongoing 2016-2017 campaign. I will also discuss plans for upcoming seasons and long term prospects for this exciting emerging field: multi-messenger cosmology with gravitational waves and optical data.

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