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ISS-TAO: A Transient Astrophysics Observer with a Focus on X-rays PETER SHAWHAN, Univ of Maryland-College Park, ISS-TAO TEAM — X-rays offer a valuable view of energetic astrophysical events, including neutron star binary mergers which produce both short gamma-ray bursts and gravitational-wave signals. ISS-TAO is a proposed NASA mission of opportunity, currently in a Phase A study, for deployment on the International Space Station around 2022. ISS-TAO's primary instrument is a wide-field imager (WFI) for soft X-rays. By using microchannel ("lobster eye") optics to focus X-rays onto CCDs, the WFI is able to achieve very good sensitivity and point source resolution over a field of view of hundreds of square degrees. A gamma-ray transient monitor (GTM) provides all-sky triggering and timing for gamma-ray bursts and other energetic transients. A multi-axis pointing system and on-board algorithms enable triggered observations, either autonomous or initiated from the ground, with staring and survey modes. These capabilities make ISS-TAO an exceptionally powerful tool for finding and studying the X-ray afterglows of short gamma-ray bursts—including counterparts of gravitational-wave events, targeting sky maps uploaded from the ground—as well as tidal disruption flares, supernova shock break-outs, and modulation of X-ray flux from active galactic nuclei.

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