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Multi-messenger Astrophysics with Swift and IceCube MILES SMITH, Penn State University, NEIL GEHRELS, NASA GSFC, DOUG COWEN, JOHN NOUSEK, Penn State University, ANNA FRANCKOWIAK, Humboldt University of Berlin, IGNACIO TABOADA, Georgia Institute of Technology — NASA's Swift telescope has greatly enhanced our understanding of violent astrophysical events, especially gamma-ray bursts. While Swift studies the electromagnetic radiation from these events, other observatories are searching for corresponding cosmic rays, gravity waves, and neutrinos. An initiative is underway to utilize the rapid response of Swift to follow up triggers from these multi-messenger observatories. This talk will address the new capabilities required of Swift and will focus on the collaborative effort between the Swift and IceCube collaborations. The IceCube telescope, located at the South Pole, is searching for astrophysical neutrinos through their interactions in the polar ice. In an effort to mitigate background events, IceCube searches for two or more neutrinos in temporal and spatial coincidence. In response, Swift will slew to observe the IceCube trigger region in X-ray and UV. By accumulating data over a number of orbits, Swift will distinguish between steady sources and the afterglow typical of a burst event. In particular, we will be sensitive to burst events that do not produce prompt gamma rays, which are conjectured to be significantly more numerous than gamma-emitting bursts.

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