

**[초IT-04] Ultra-Fast Flash Observatory (UFFO) for early photon measurements from Gamma Ray Bursts**

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We describe the space project of Ultra-Fast Flash Observatory (UFFO), which will observe early optical photons from gamma-ray bursts (GRBs) with a sub-second optical response, for the first time. The UFFO will probe the early optical rise of GRBs, opening a completely new frontier in GRB and transient studies, using a fast-response rotatable mirror system which redirects optical path to telescope instead of slewing of telescopes or spacecraft. In our small UFFO-Pathfinder experiment, scheduled to launch aboard the Lomonosov satellite in June 2012, we use a motorized mirror in our Slewing Mirror Telescope instrument to achieve less than one second optical response after X-ray trigger. We describe the science and the mission of the UFFO project, including a serious version called UFFO-100 which will be launched in 2014. With our program of ultra-fast optical response GRB observatories, we aim to gain a deeper understanding of GRB mechanisms, and potentially open up the  $z>10$  universe to study via GRB as point source emission probes.