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The Transient program of the Cherenkov Telescope Array

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The Cherenkov Telescope Array (CTA) is the next generation high-energy gamma-ray observatory using the Imaging Air Cherenkov Telescope (IACT) technique. It will improve the sensitivity level of current instruments by an order of magnitude, provide energy coverage for photons from 20 GeV to at least 300 TeV to reach to high redshifts and extreme accelerators. It will provide access to the shortest timescale phenomena. CTA is thus a uniquely powerful instrument for the exploration of the violent and variable universe.

The ability to probe short timescales at the highest energies should allow CTA to explore the connection between accretion and ejection phenomena surrounding compact objects, study phenomena occurring in relativistic outflows and open up significant phase space for serendipitous discovery. Aiming at playing a central role in the era of multi-messenger astrophysics, the CTA Transient program includes responding to a broad range of multi-wavelength and multi-messenger alerts, including Galactic compact object binary systems as well as gravitational wave detections and high-energy neutrino transients. The most dramatic case is that of gamma-ray bursts (GRBs) where CTA will make high-statistics measurements for the first time above ~10 GeV, probing new spectral components which will shed light on the physical processes at work in these systems. Another key element of the program is rapid feedback to the wider community on the VHE gamma-ray properties of transients.

This contribution will introduce and outline the CTA Transients program. It will provide an overview over the various science programs and discuss their links to multi-messenger and multi-wavelengths observations.

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