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W.K.H. Panofsky Prize Talk: The Utah Fly's Eye Detector[1]

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In 1963, John Linsley detected a 100 EeV extensive air shower (EAS) at Volcano Ranch, New Mexico. Greisen, Kuzmin and Zatsepin realized that the existence of cosmic rays exceeding 60 EeV (UHCR) was surprising since inverse photoproduction off the 3 K CMB should severely degrade their intensity, now called the GKZ cutoff. Greisen suggested that UHCR should generate enough air fluorescence light that they might be detected within an area exceeding 1000 km^2. The Utah group proposed such a detector, the Fly's Eye, which could realize Greisen's suggestion and detect UHCR at a greater rate than had been achieved by more conventional means. The expectation was to identify the primary particles and demonstrate that if they existed in significant number then the sources must be "local," consistent with the prediction of GKZ. The detection of UHCR with a prototype Fly's Eye detector was carried out in coincidence with Linsley's Volcano Ranch array. Subsequently, the Utah group built two all sky detectors, Fly's Eye I and II, which operated together for many years in the remote western Utah desert. The design, construction and operational characteristics of the detector and some of its results will be presented in the talk.

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