INVITED LECTURES

Stars as probes of our own atmosphere

Jan Ebr, CZE

FZU - Institute of Physics, Czech Republic

The FRAM robotic telescopes started as experimental tools for atmospheric monitoring at astroparticle observatories over two decades ago. Over time, both their purpose and methods have greatly changed, sometimes following unexpectedly twisting paths. The original design target of the FRAM at the Pierre Auger Observatory was the measurement of wavelength dependence of aerosol extinction using photoelectric measurements of bright stars. After this has proven prohibitively difficult, the program re-focused on rapid cloud detection along the apparent trajectory of interesting cosmic ray showers - and during these observations, the breakthrough method of aerosol measurement using wide-field photometry was developed, leading to the expansion of the FRAM project to support the upcoming Cherenkov Telescope Array Observatory. Eventually, we went full circle: using the exceptionally stable conditions at Roque de los Muchachos, we can now show that the wide-field method is actually the right way for the wavelength-dependence measurement. As this quantity is directly correlated with the size of the aerosol particles, we are here opening a new window for atmospheric physics at night, with possibly broad application far beyond simple atmospheric monitoring.