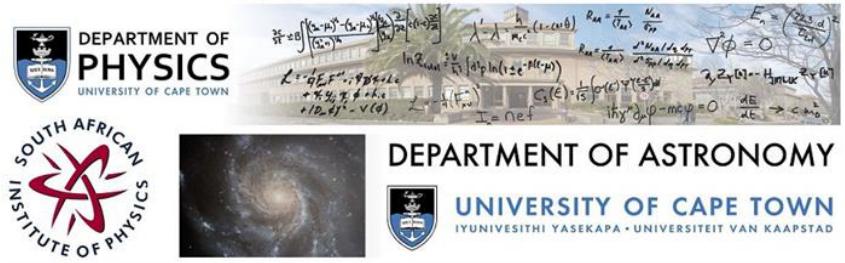


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# A study into the rate of photo-bleaching undergone by radiation damaged plastic scintillators

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## Abstract content <br>   (Max 300 words)<br><a href="http://events.saip.org.za/getFile.py/a target="_blank">Formatting &<br>Special chars</a>

Plastic scintillators play an important role in the field of detector physics due to their ability to undergo luminescence when interacting with ionising radiation. They typically consist of a polymer base containing an aromatic ring structure as well as small concentrations of fluorescent dopants. The $\pi$-electrons from the aromatic structure give rise to the primary scintillation mechanism, whilst the added fluors boost the eventual light yield as well as shift the wavelength of the emitted light.

Upon excitation by energetic UV light (< 250 nm) in air, the scintillation mechanism can be stimulated with the fluorescent medium being subjected to the effect of photo-bleaching. Photo-bleaching leads to the chemical alteration of fluors, and renders them unable to fluoresce, thereby reducing the light yield of the scintillators. In this study, we investigate the rate of photo-bleaching for several plastic scintillators using an excitation laser of 229 nm. We further investigate the effect on the photo-bleaching rate for samples which have been subjected to proton induced radiation damage.

The study will contribute to a comparative to be used by the Tile Calorimeter of the ATLAS detector where scintillators employed in the GAP region will be replaced in 2018.

## Apply to be<br> considered for a student <br>   award (Yes / No)?

Yes

## Level for award<br> (Hons, MSc, <br>   PhD, N/A)?

MSc

## Main supervisor (name and email)<br>and his / her institution

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## Would you like to <br> submit a short paper <br> for the Conference <br> Proceedings (Yes / No)?

Yes

**Please indicate whether<br>this abstract may be<br>published online<br>(Yes / No)**

Yes

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