BGRem: Background noise removal for astronomical images

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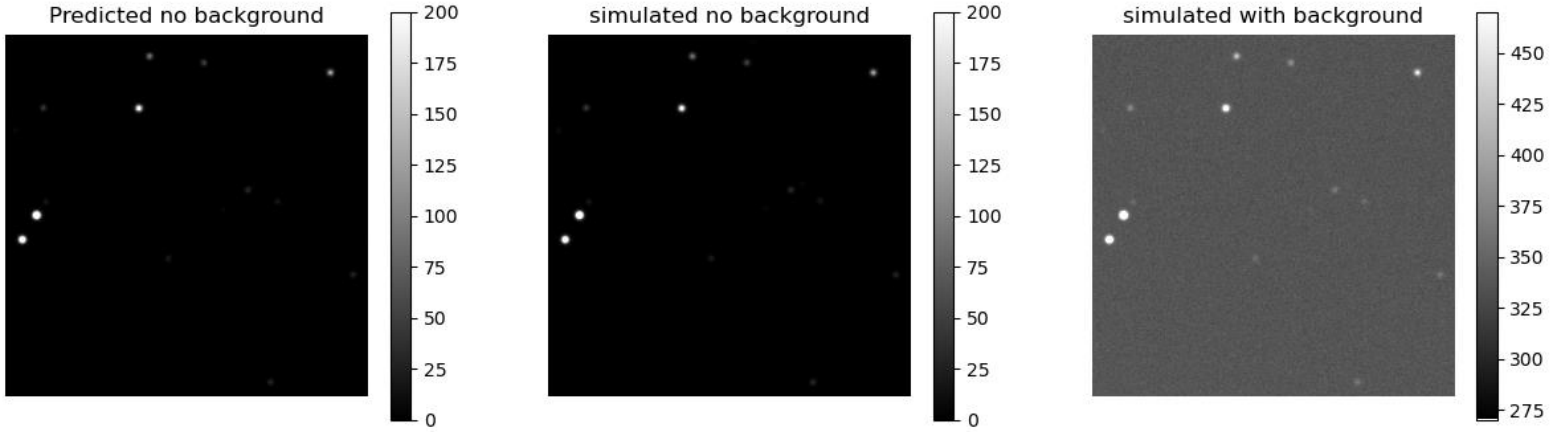
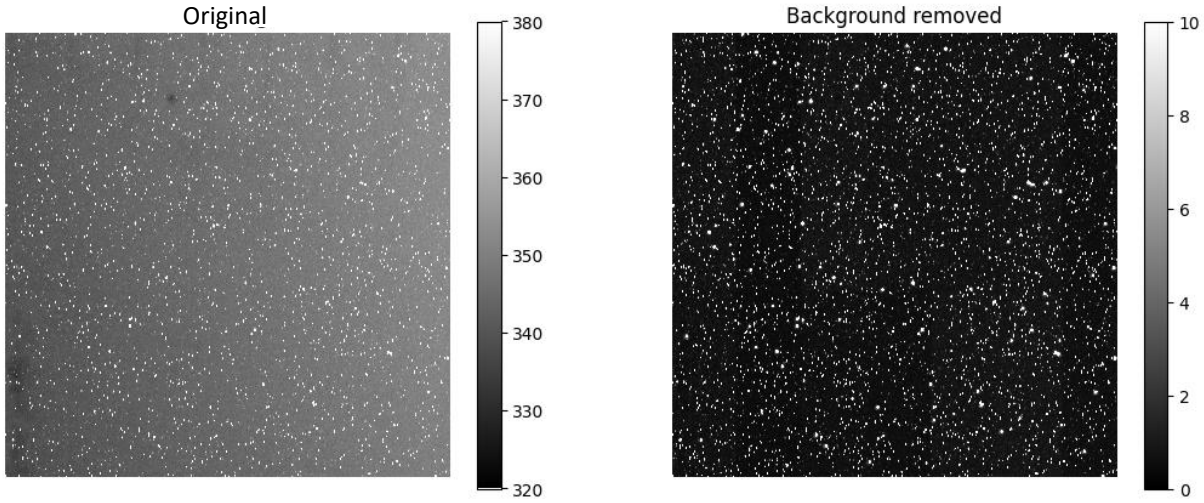
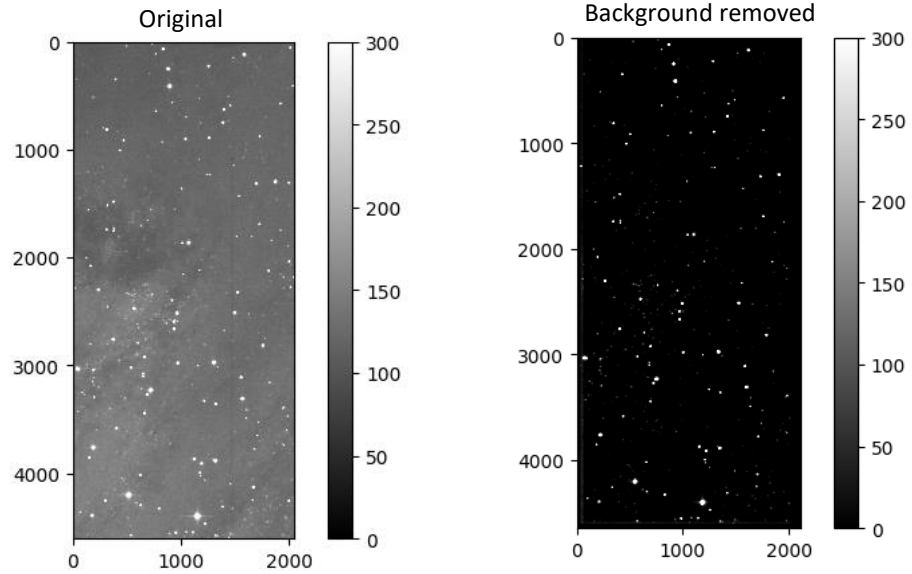
Test Data



- Diffusion model with attention U-net
- Trained on simulated MeerLICHT images
- Can remove complex backgrounds

Real images





Source Localisation

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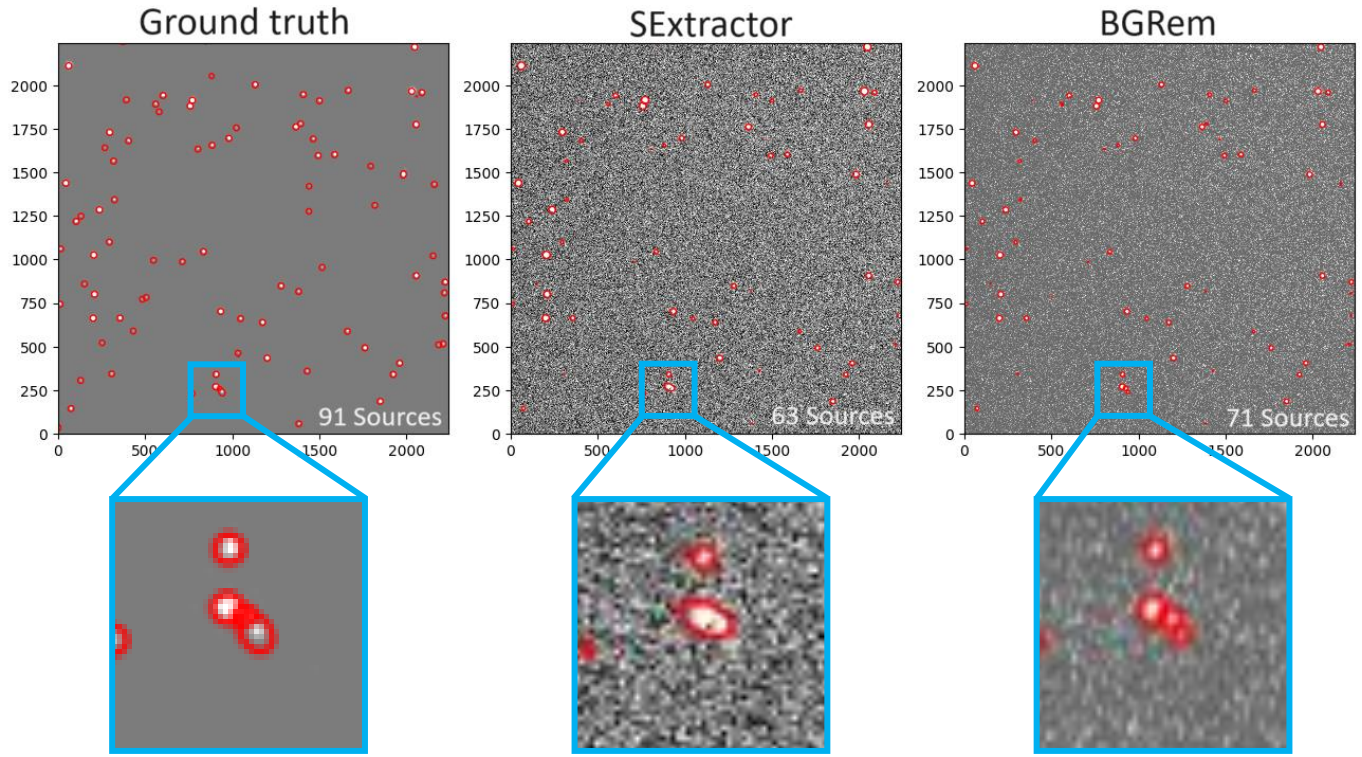
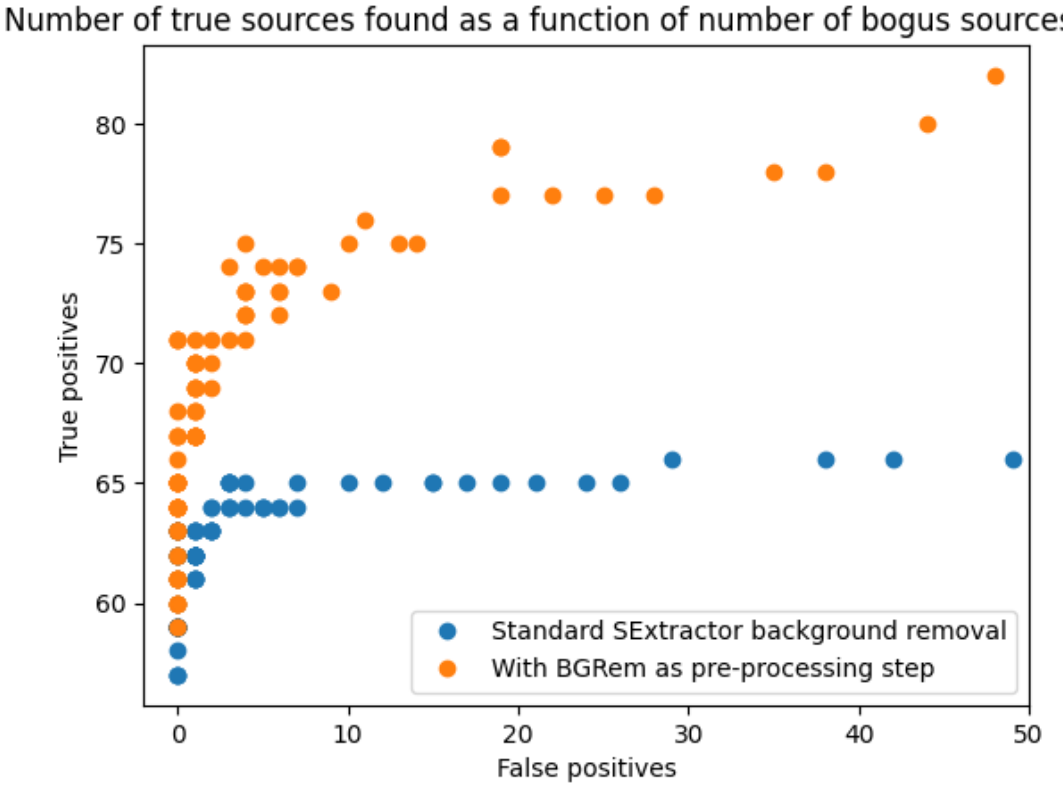
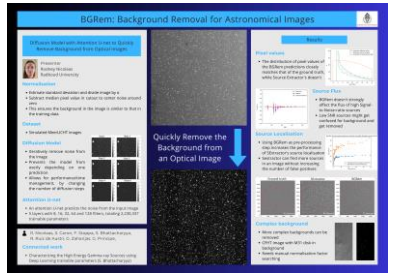
- Find more sources with Sextractor
- No increase in bogus sources
- Helps distinguish sources with close proximity





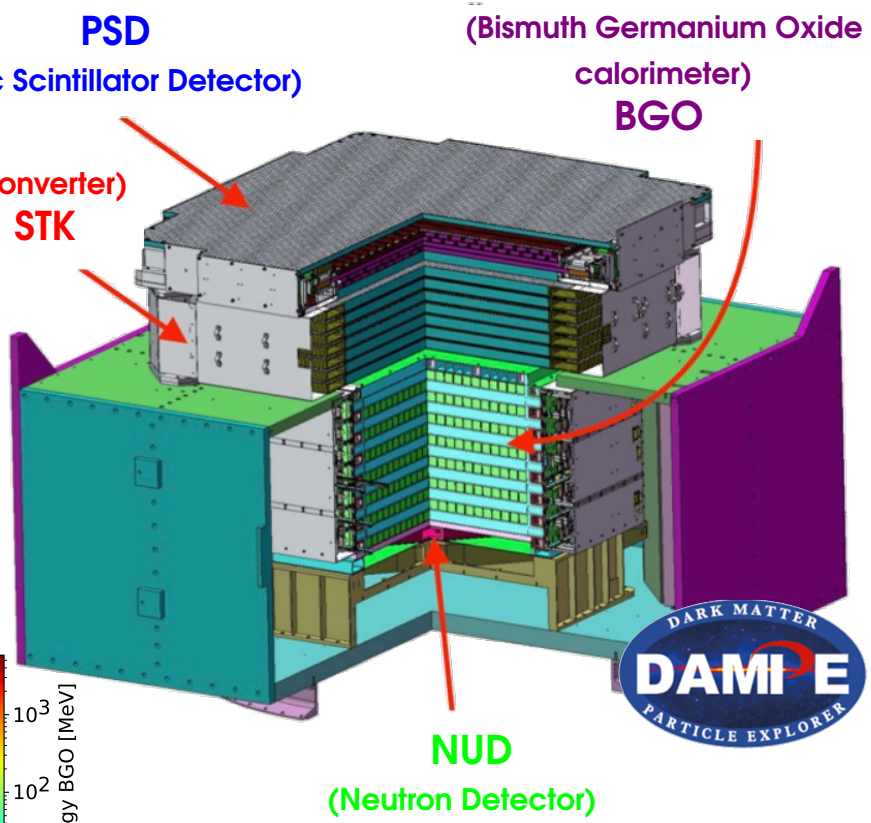
Poster Thursday lunch
Location 88



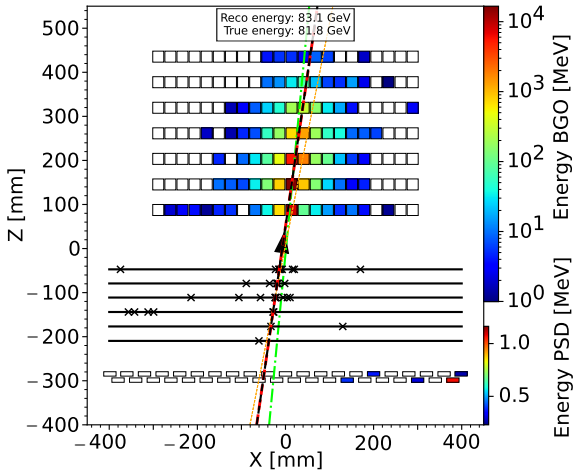
Motivation

EPFL

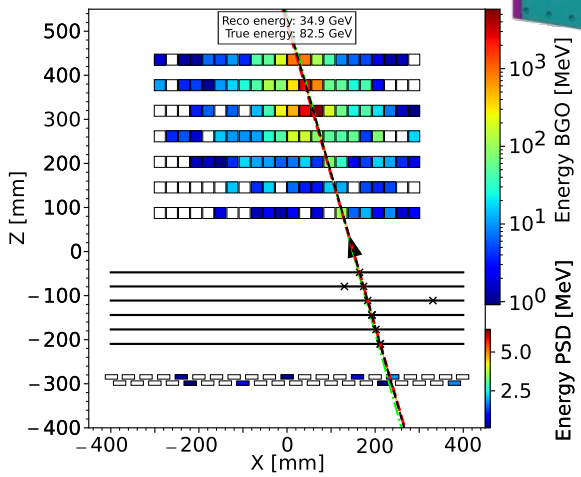
- **Goal:** Obtain an efficient γ-ray event selection
- Most abundant cosmic-ray component: **protons**
- Main difference between γ-rays and protons: **shower topology** in the BGO calorimeter



MC Gamma



MC Proton



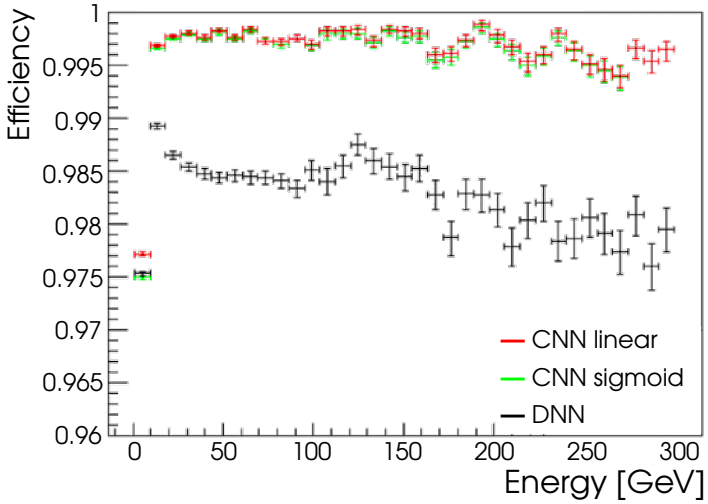
$\longrightarrow$ ideal ML tool to recognise features from images:

$\Longrightarrow$ **Convolutional Neural Network!**

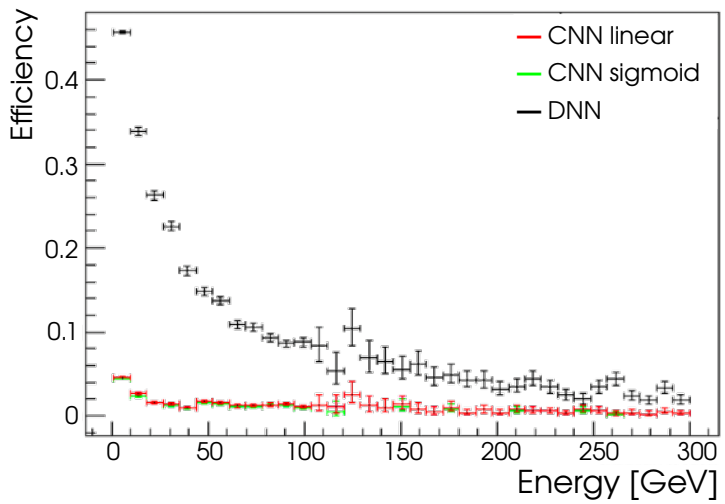
CNN model, training, score

EPFL

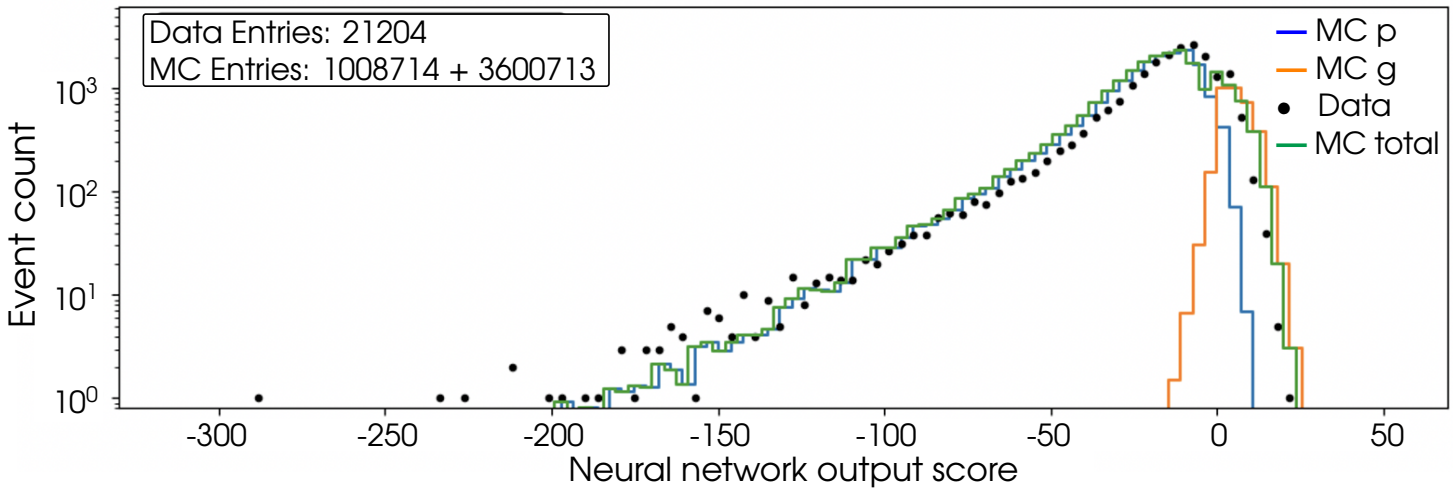
MC γ-ray



MC Proton



- This method significantly outperforms all the existing algorithms, both in γ-ray efficiency and proton rejection! **Output:** CNN score $[-\infty, +\infty]$ validation



Want to learn more details? Please visit my poster in session B :)