# A Southern Gammaray-Survey Observatory

Harm Schoorlemmer / Jim Hinton / Ruben Lopez-Coto

## ....because air showers are big!



....because air showers are big!



....because muons travel far





## ....because muons travel far



# ....therefore detectors need to be cheap!



but at the end the driver is engineering cost at a specific site...

Approaches to study specific science cases

#### Approaches in assessing array performance....

#### ...full GEANT4 simulation



0.5 TeV gamma-ray with similar Xmax simulated in HAWC (left) and bigger array at 5 km with maximal fill factor

Approaches in assessing array performance....

#### ...full GEANT4 simulation

Also needed:

- > Simulate the physics cases
- > Simulated noise rates:
  - Single p.e. rates
  - Individual muons
  - Confusion with small showers
- > Simulation of electronics & trigger
- > Full reconstruction chain

## A very difficult graph ...



#### A very difficult graph ... not very useful for most science cases



#### Dark Matter from the galactic center....



Dark Matter from the galactic center....



#### Pragmatic approach, rescaling HAWC.....



#### Assumptions:

- Performance stays the same if same amount of energy is detected
- Simple scaling of area and observation time



# Funding situation / MPI-K -Germany

Currently applying for "pathfinder-array" funds:

- Excellence cluster on Dark Matter: Funding for R&D and possibility to fund a ~5% pathfinder
- ERC-Startup grant:
  Funding for pathfinder computing facilities
  Some funds available for pathfinder work

**Possibility of a significant German contribution** (MPG+) in ~3-4 years time

# We are offering to host a meeting next fall in Heidelberg

