

**IceCube**  
NEUTRINO OBSERVATORY

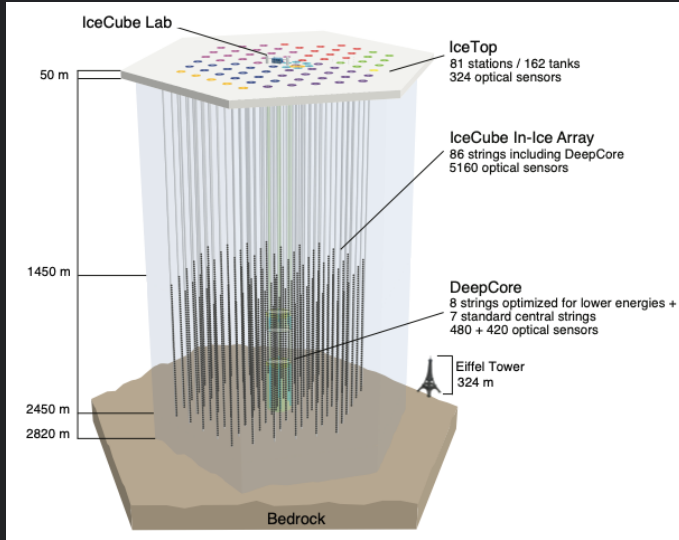
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# Observing the Prompt Component of the Atmospheric Muon Flux Using IceCube

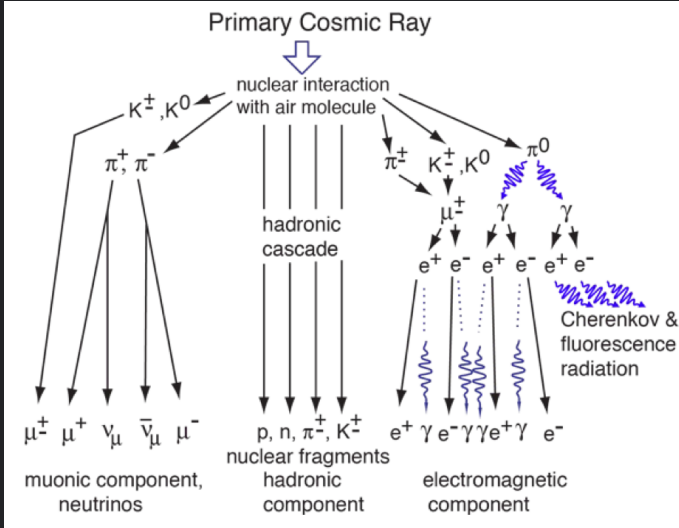
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Leander Flottau

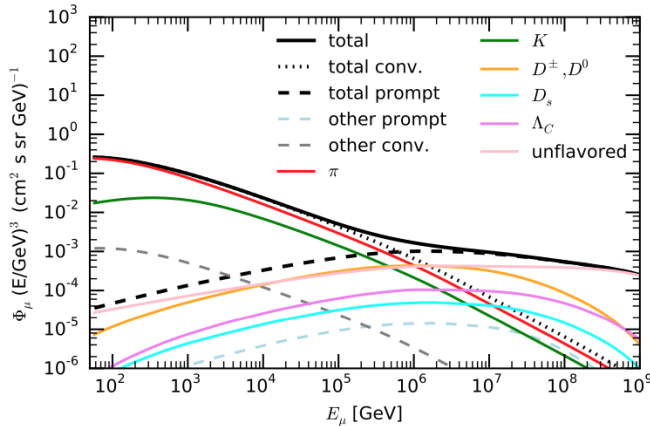
10. März 2025



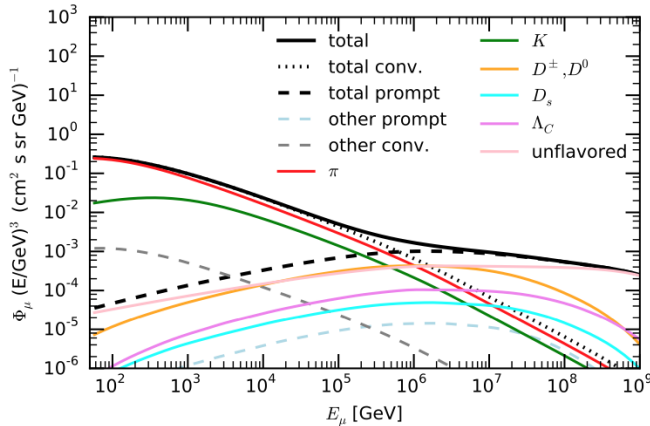
- Cubic kilometer scale cherenkov detector
- 5160 DOMs on 86 strings
- $\approx 270$  measured Nutrino Events per day
- $\approx 3$  kHz



- Cosmic ray interactions produce secondary particles
- Major decay product:  $\mu$



- Conventional: produced by  $K^\pm/\pi^\pm$
- Prompt: produced by short lived particles
- Prompt dominant at high energies



- More muons measured than simulations predicted
- Composition of secondary particles in cosmic ray interactions
- Hadronic interaction models
- Muons in IceCube: high energies and forward boosted

## Simulations and tagging

- Tagging of parent particles in CORSIKA simulations
- Prompt definition based on parent of leading muon
- Allows MC-Sample with prompt/conventional distinction