

# Origin of galactic cosmic rays of energies up to the PeV: the Pevatrons

2<sup>nd</sup> year of PhD: Dubos Coline – Supervisor: Pr. Tiina Suomijarvi



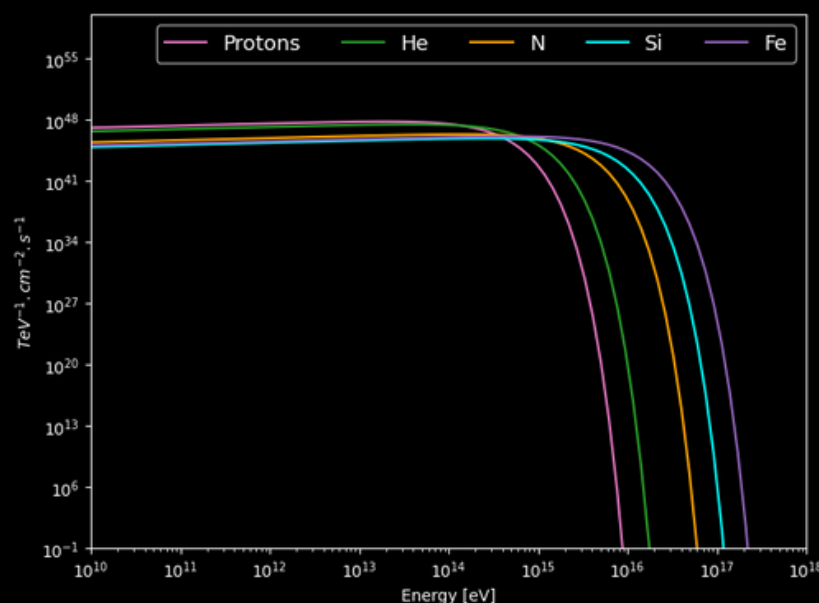
RX J1713.7-3946

**Supernova Remnant**

Are protons and **heavier nuclei** accelerated efficiently by **SNRs**?

Particle spectrum

Cosmic-ray energy spectrum and composition up to the ankle (Thoudam et al.)



Particle distribution

● Abundances of GCRs

$$f(E) = f \cdot \sigma \cdot A_p \cdot (E/E_0)^{-\alpha} \cdot e^{-\beta \cdot (E/Z \cdot E_c/A)}$$

● Cross section



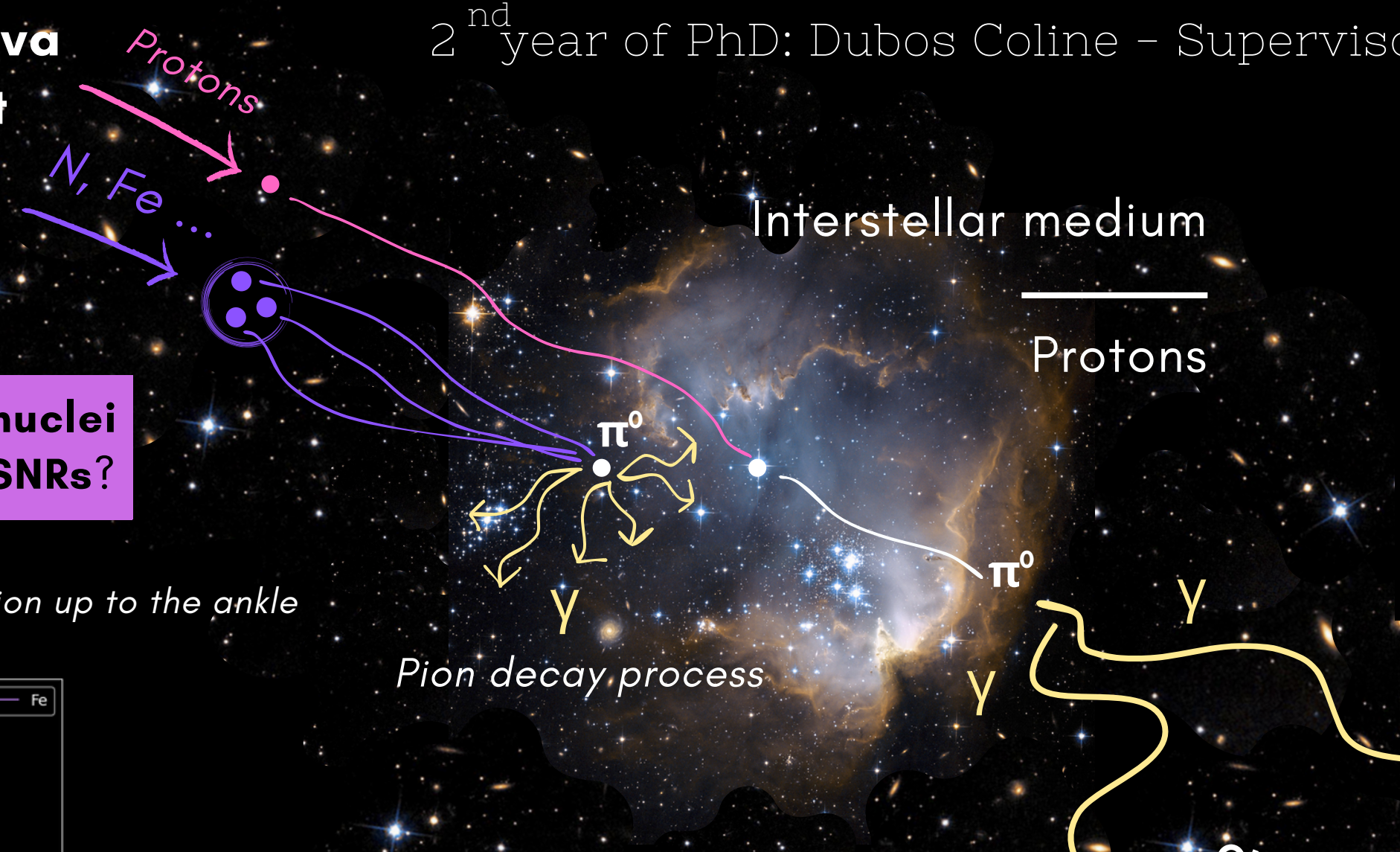
Can we see **cosmic rays** from **SNRs** by measuring **γs** with **CTA**?

Simulation for CTA

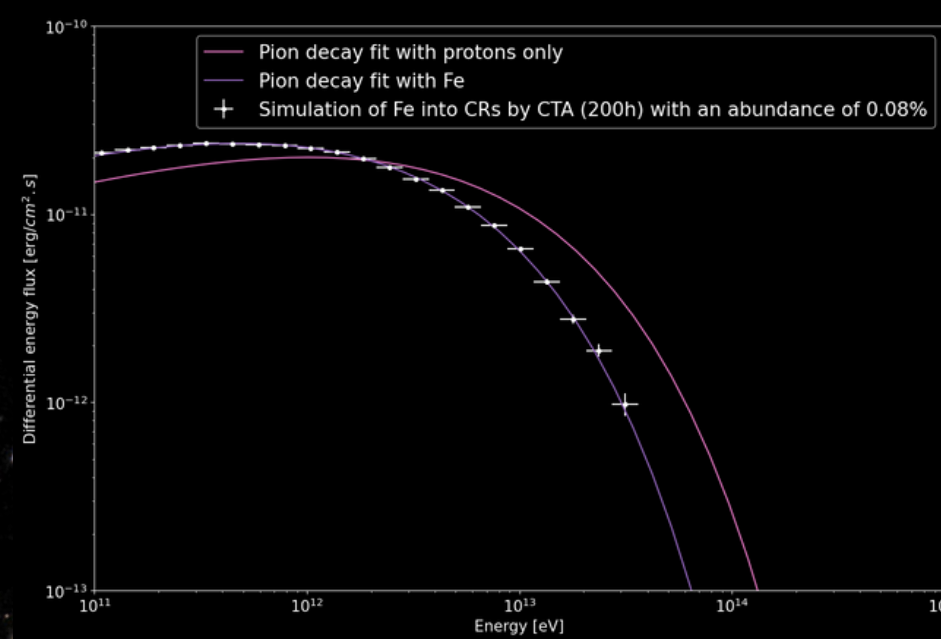
IRF - prod5 v0.1

Pion decay models - Naima (Gammapy)

**Fixed parameters**



Fits - TS (Fe-P)  $\approx$  6755



**CTA is sensitive to CRs composition!**

Cherenkov Telescope Array  
20 GeV-300 TeV

