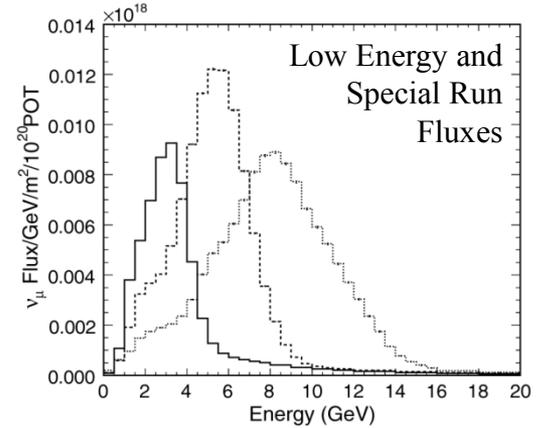
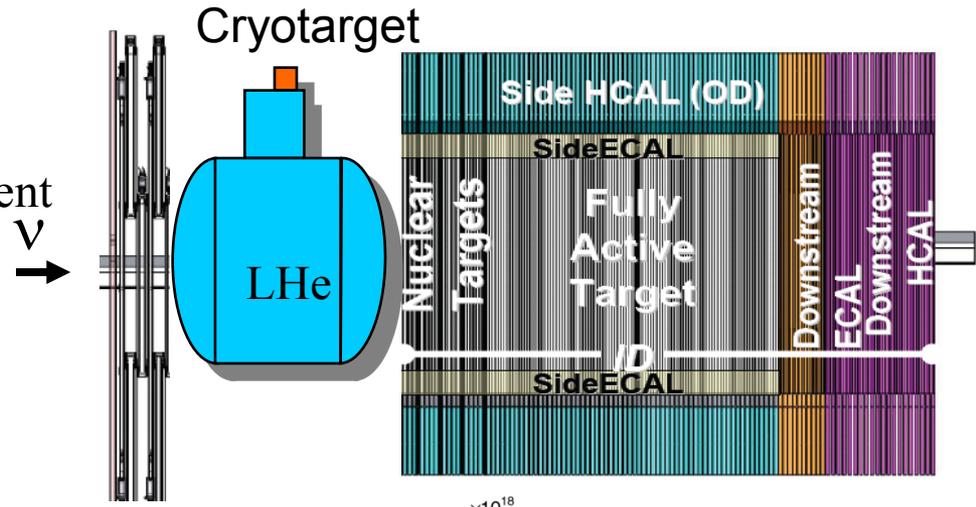


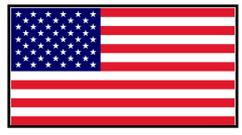
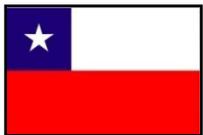


# MINERvA: What and Why?

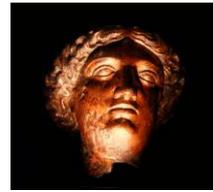
- ◆ MINERvA is studying neutrino interactions in unprecedented detail
- ◆ *What are the goals?*
  - ◆ To make measurements needed for current and future oscillation experiments
  - ◆ Measurements of weak interactions on a variety of strongly bound systems
- ◆ *Why MINERvA at NuMI?*
  - ◆ NuMI provides
    - » High intensity for precision measurements in a fully active detector
    - » A wide range of available energies
  - ◆ The MINERvA detector
    - » Supports reconstruction of a broad range of final states
    - » Has multiple nuclear targets to study the effect of the nucleus on neutrino interactions



~85 Particle, Nuclear, and Theoretical physicists from 21 Institutions



# MINERvA Physics Reach

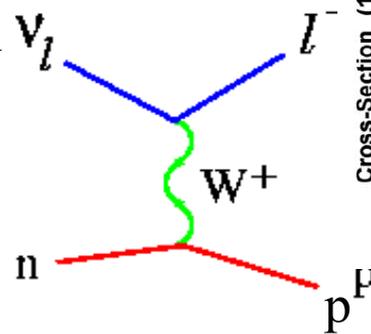


## ◆ *NuMI Beam provides:*

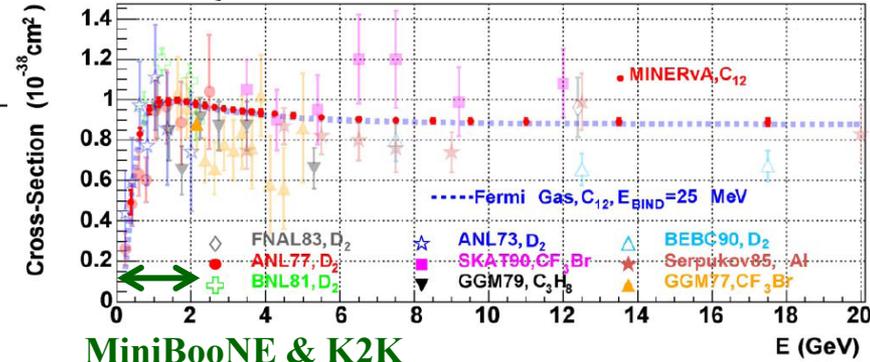
- ◆ Million event statistics for 1 ton targets in 4 year run
- ◆  $\nu$  Energies from 1-20GeV

## ◆ *MINERvA Detector provides:*

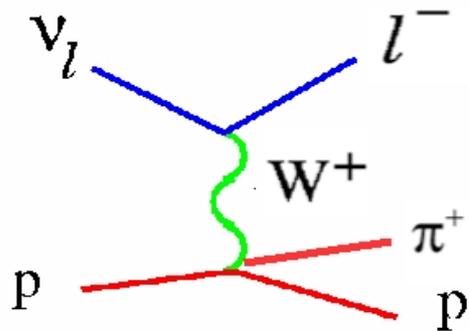
- ◆ Clean identification of common and rare processes
- ◆ unprecedented comparisons from atomic number 2 to 82



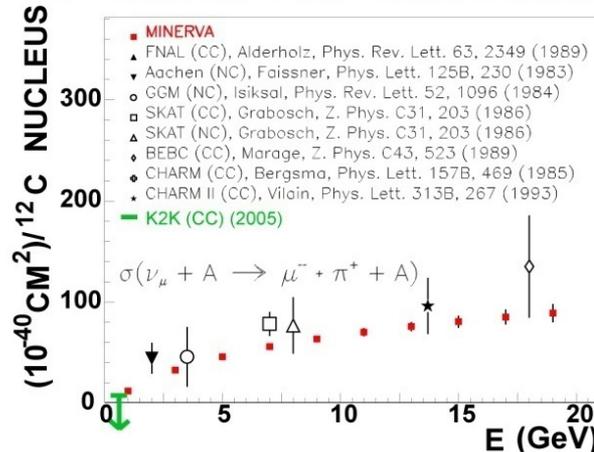
## Quasi-Elastic Cross Section



MiniBooNE & K2K measurements



## CC Coherent Pion Cross-Section



Target Material	Fiducial Mass (ton)	Charged Current Sample
Helium	0.25	0.6M
Hydrocarbon	3	8.6M
Carbon	0.6	1.4M
Iron	1	2.9M
Lead	1	2.9M
Water	0.3	0.7M

# MINERvA Detector Status



## ◆ Construction complete

- ◆ 2.3 years to build detector
- ◆ On time, under budget

## ◆ Installation complete

- ◆ Modular design allowed installation and commissioning in NuMI Beam before last components are built
- ◆ Recorded  $\sim 0.8 \times 10^{20}$  POT Antineutrinos, 11/09-3/10, 55% of detector

## ◆ Approved for $16 \times 10^{20}$ POT

## ◆ Run Start with neutrinos and full detector: March 22, 2010

105m  
below  
ground in  
NuMI  
Beamline:

Last  
Module  
going in

