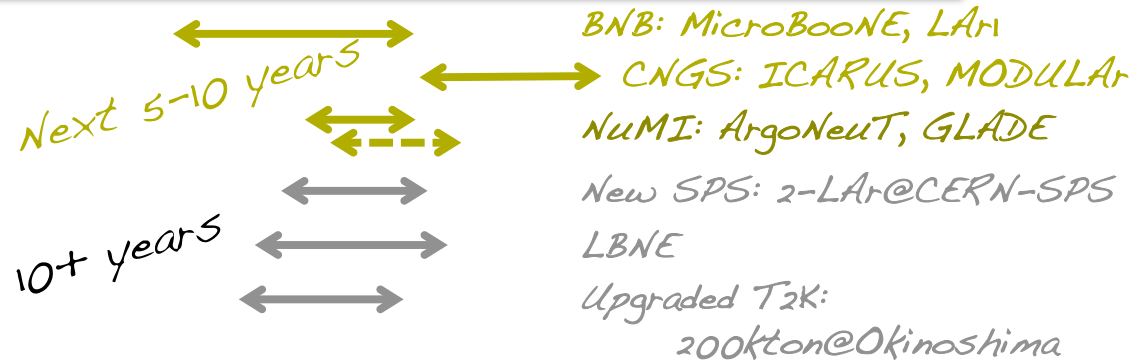
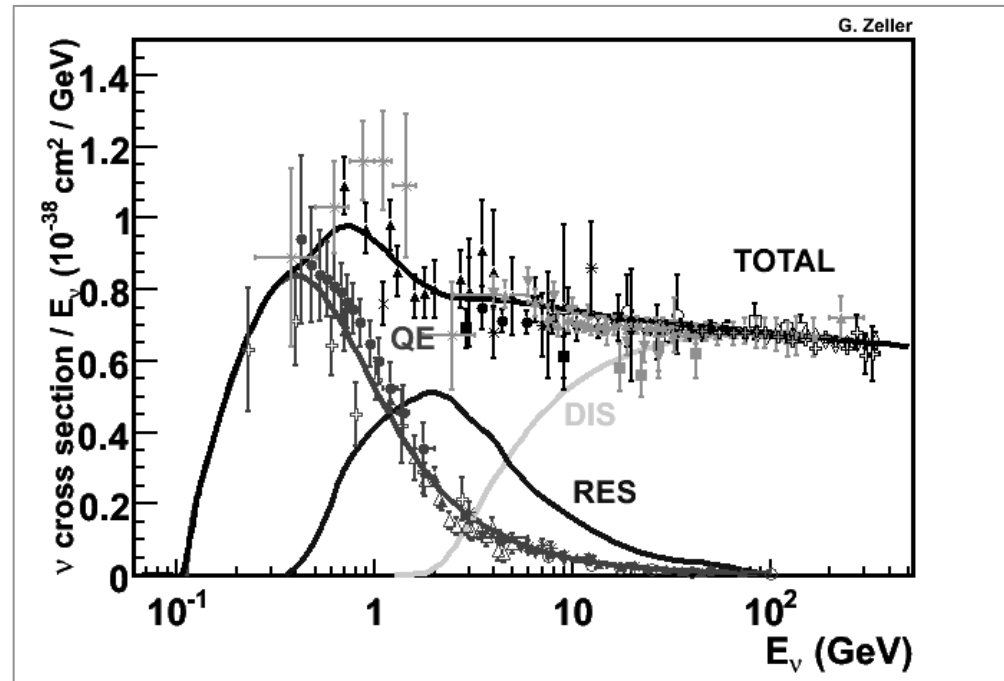


Current and future LArTPC experiments

Neutrino interaction channels of interest:

- CCQE scattering
Study of nuclear effects via final state observables (vertex activity, multiplicity, E_{reco})
- ν -N NC elastic scattering
Measure ΔS and improve sensitivity of dark matter searches
 $T_{p,min} \sim 40 \text{ MeV}$ ($Q^2 \sim 0.08 \text{ MeV}^2$)
- Kaon production
 p -decay background constraints
- Single- π production
Resolve theoretical tension?
- Hyperon production
- Single-photon production
in low energy scattering
- First conclusive ν_e cross-section measurements ($\sim 1 \text{ GeV}$)



Experiment	LAr mass (tons)	Physics goal	Baseline (km)	E_ν (GeV)	Where	Status	Online
ICARUS	600	R&D, Long baseline (single detector)	732	~5-25	Gran Sasso (CNGS beam)	Running	Fully operational in 2010
ArgoNeuT	175L	R&D, Cross sections	1	~0.1-10	NuMI near	Completed	N/A
MicroBooNE	170 (60 fiducial)	R&D, Short baseline (single detector)	0.47	~0.1-3	FNAL (BNB)	Under construction	2014
LAr1	60 + 1000 (fiducial)	Short baseline (2 detectors)	0.2 + 0.7	~0.1-3	FNAL (BNB)	LOI	~5 yrs
2-LAr @ CERN-SPS	150 + 478 (fiducial)	Short baseline (2 detectors)	0.3 + 1.6	~2	CERN (new beam from SPS)	Proposal	~5 yrs
MODULAr	5,000	Long baseline (shallow depth)	730	~5-25	Gran Sasso	Planned	~5-10 yrs
GLADE	5,000	Long baseline (surface)	810	~0.5-2	NuMI off-axis	LOI	~5-10 yrs
LBNE	Start with 10,000	Long baseline (surface FD initially)	1300	~0.5-5	Homestake (new FNAL beam)	Planned (CD-1)	10+ yrs
LAGUNA/LBNO	Start with 20,000	Long baseline (underground FD)	2300	~few	Finland (new CERN beam)	EOI in preparation	10+ yrs
100kton @ Okinoshima	Up to 100,000	Long baseline (underground FD)	665	~0.5-2	Okinoshima island (new J-PARC beam)	R&D Proposal at J-PARC	10+ yrs

+ various R&D and test experiments:

US: Materials Test Stand, LAPD, LARIAT, Los Alamos LDRD LArTPC

Europe: 50-liter @ CERN, 10m³, LArTPC in B-field, ArgonTube, UV Laser

Japan: Test-beam T32 @ J-PARC