ID	Poster title
1 - 1	Acoustic Position Calibration in KM3NeT
2 - 2	On the capability of the future KM3NeT telescope to detect high-energy neutrinos from Fermi bubbles.
3 - 3	KM3NeT sensitivity and discovery potential for galactic point-like sources
4 - 1	Status of the KM3NeT project
5 - 2	Search for Ultra High Energy Neutrino Diffuse Flux with ANTARES Telescope
6 - 3	Search for point sources with the ANTARES neutrino telescope using 2007-2010 data
7 - 1	Search for neutrino emission from the Fermi Bubbles with ANTARES
8 - 2	Preliminary results from the Askaryan Radio Array (ARA) prototype and first station
9 - 3	ARA - Design and status of the Askaryan Radio Array
10 - 1	Neutrino Radiography with IceCube Neutrino observatory
11 - 2	Search for Neutrinos from The Galactic Plane and Other Astrophysical Extended Sources with IceCube
12 - 3	A search for the extremely high energy cosmogenic neutrinos with the IceCube 2010-2011 data
13 - 1	Searches for Neutrinos from GRBs with IceCube
14 - 2	Extending IceCube-DeepCore with PINGU
15 - 3	Search for High-Energy Neutrino Point Sources with IceCube
16 - 1	Deep Underground Astroparticle Physics at SNOLAB
17 - 2	Nucleus-Survival Bounds on High-Energy Neutrino Backgrounds
18 - 3	ARIANNA - A New Concept for the Detection of GZK Neutrinos
20 - 2	Performance and Status of the HAWC Gamma-Ray Observatory
21 - 3	The Tianshan Radio Experiment for Neutrino Detection
22 - 1	The physics potential of the diffuse supernova neutrino background
23 - 2	Supernova neutrino monitor at Super-Kamiokande
24 - 3	Study of low energy electron anti-neutrinos at Super-Kamiokande IV

ID	Poster title
25 - 1	Supernova detection with IceCube and beyond
26 - 2	SNOwGLoBES: SuperNova Observatories with GLoBES
27 - 3	Low energy performances and coherent detection of supernova neutrinos in CUORE-0 and CUORE experiment
28 - 1	HALO - a new lead-based dedicated supernova detector
29 - 2	Towards an extragalactic Supernova neutrino detector at the South Pole
30 - 3	The long term variation of supernova neutrino spectra
31 - 1	Systematic study of supernova neutrino oscillation using outputs of supernova simulations
32 - 2	Solar neutrino results of Super-Kamiokande IV
33 - 3	A wide-band solar neutrino trigger for Super-Kamiokande
34 - 1	The Hyper-Kamiokande Project: Sensitivity for low-energy neutrinos
35 - 2	Low Energy Neutrino Spectrometer (LENS)
36 - 3	Prototyping for A Low Energy Neutrino Spectrometer (LENS)
37 - 1	Backgrounds and Solar Neutrinos in SNO+
38 - 2	Mass Hierarchy Study with MINOS Far Detector Atmospheric Neutrinos
39 - 3	Observations of Atmospheric Neutrinos and Anti-neutrinos by the MINOS Experiment
40 - 1	Atmospheric neutrino oscillations with IceCube/DeepCore
41 - 2	Full three-flavor oscillation analysis of atmospheric neutrino data observed in Super-Kamiokande
42 - 3	The Hyper-Kamiokande Project: Sensitivity for proton decay searches
43 - 1	Towards a background-free KATRIN spectrometer
44 - 2	Calibration and stability monitoring of the KATRIN experiment
45 - 3	Towards a Neutrino Mass Measurement: First Data from the Project 8 Prototype
46 - 1	The Ho-163 EC Decay to Measure the Electron Neutrino Mass in the framework of MARE
47 - 2	Backgrounds for KamLAND-Zen experiment
48 - 3	^{10}C Background Reduction by MoGURA for KamLAND-Zen

ID	Poster title
49 - 1	Energy and Vertex Calibration and Background estimation in KamLAND-Zen
50 - 2	Next Phase of KamLAND-Zen
51 - 3	CANDLES - Search for neutrino-less double beta decay of ^{48}Ca -
52 - 1	Recent Results of the COBRA Experiment
53 - 2	R&D Activities of COBRA for a Large Scale Experiment
54 - 3	Neutrinoless Double Beta Decay with SNO+
55 - 1	Search of neutrino-less double beta decay of Neodymium 150 in the NEMO3 experiment
56 - 2	The status of the SuperNEMO experiment
57 - 3	A low-background large-scale gas tracker for SuperNEMO
58 - 1	The Muon Veto of the GERDA $0\nu\beta\beta$ Experiment
59 - 2	Development of a liquid argon scintillation veto for GERDA
60 - 3	Surface background suppression in BEGe detectors for GERDA Phase II
61 - 1	The LUCIFER project: a scintillating bolometer array for search for Neutrinoless Double Beta Decay
62 - 2	AMoRE project
63 - 3	Large Bolometer Arrays for the Neutrinoless Double Beta Decay Search
64 - 1	The Search for $0\nu\beta\beta$ with CUORE: First signals from CUORE-0.
65 - 2	The NEXT Experiment
66 - 3	The MAJORANA Neutrinoless Double-Beta Decay Experiment
67 - 1	Development of low-temperature detectors for a $0\nu\beta\beta$ search
68 - 2	The Hyper-Kamiokande Project: Performance measurement of photodetector
69 - 3	Search of the WIMP from the Sun in Super-Kamiokande
70 - 1	Indirect Dark-Matter Detection Through KamL AND
71 - 2	NEWAGE direction-sensitive dark matter search
72 - 3	Dark Matter Search with Multi-layer NaI Crystals PICO-LON

ID	Poster title
73 - 1	Determining the dark matter properties with neutrinos in IceCube/DeepCore
74 - 2	Search for Dark Matter Captured in the Sun with the IceCube Neutrino Observatory
75 - 3	Search for Dark Matter in Galactic and Extragalactic Halos with the IceCube Neutrino Observatory
76 - 1	Search for Secluded Dark Matter using the IceCube Neutrino Observatory
77 - 2	Directional Dark Matter Search with Nuclear Emulsion
78 - 3	Low Energy Neutrino and Dark Matter Physics with Sub-keV Germanium Detectors
79 - 1	Indirect Dark Matter Detection in the Light of Sterile Neutrinos
80 - 2	Search for Solar Axions Produced in the $p + d \rightarrow {}^3\mathrm{He} + \mathrm{A}$ Reaction
81 - 3	Search for 5.5 MeV solar axions with Borexino detector
82 - 1	An Optical Transition Radiation Monitor for the T2K Proton Beam Line
83 - 2	Measurement of Pion and Kaon production cross sections with NA61/SHINE for T2K
84 - 3	Hadron Production Measurements with the T2K Replica Target in NA61/SHINE for the T2K Neutrino Flux Prediction
85 - 1	Performance of the Muon Monitor in the T2K Experiment
86 - 2	Improvement and recent status of the beam monitoring with T2K neutrino beam monitor INGRID
87 - 3	Measurement of the flux averaged Inclusive Charged Current cross-section
88 - 1	Inclusive spectra of K0S mesons in p+C interactions at 31 GeV/c from NA61/SHINE at the CERN SPS
89 - 2	Methods to Determine Neutrino Flux at Low Energies: Investigation of the Low *nu* Method
90 - 3	First Muon-Neutrino Disappearance Study with the T2K Off-Axis Beam
91 - 1	Measurement of the ν_e Component of T2K's ν_μ Beam in the ND280 P0D
92 - 2	Sterile neutrino search at T2K using NC nuclear de-excitation gamma-rays
93 - 3	Outer Detector Events at T2K
94 - 1	T2K ν_e appearance analysis using energy spectrum
95 - 2	Recent Result of numu disappearance analysis in T2K experiment
96 - 3	Development of Small Water Cherenkov Detector "Mizuche" at T2K Near Detector Hall

ID	Poster title
97 - 1	GLADE: a Global Liquid Argon Detector Experiment
98 - 2	Status of the NOvA Experiment
99 - 3	Neutrino Physics with the NOνA Experiment
100 - 1	Search for Effects of Exotic Models in MINOS
101 - 2	MINOS+: Running the MINOS Detectors with the Medium Energy NuMI beam
102 - 3	Measuring Neutrino Oscillations with the MINOS Experiment
103 - 1	Updated results on sterile neutrinos at MINOS
104 - 2	Combined Measurement of the Beam and Atmospheric $\bar{\nu}$ Oscillation Parameters from the MINOS Experiment
105 - 3	Possibilities for underground physics experiments in the Pyhäsalmi mine
106 - 1	The International Design Study for the Neutrino Factory
107 - 2	The EUROnu CERN-to-Frejus neutrino Super Beam
108 - 3	LENA as a far detector for beam neutrinos
109 - 1	Neutrino oscillometry with LENA
110 - 2	Status of MICE
111 - 3	Sensitivity to Sterile Neutrinos from Muon Decay at νSTORM
112 - 1	Neutrinos from STORed Muons, νSTORM
113 - 2	Short baseline muon neutrino disappearance experimental results
114 - 3	NESSIE: an experimental search of sterile neutrinos with the CERN-SPS beam
115 - 1	Measurement of NC1π^0 production using the ND280 P0D
116 - 2	Pion Final State Interactions in NEUT
117 - 3	Measurement of the ν_e flux of T2K's beam in the tracker of ND280
118 - 1	Measurement of CC inclusive cross-section on Iron in a few GeV neutrino beam at the T2K
119 - 2	Constraining neutrino interaction parameters in T2K using MiniBooNE data
120 - 3	Measurement of the Muon Neutrino Spectrum at the T2K Near Detector

ID	Poster title
121 - 1	Duet experiment:Measurement of pion single charge exchange scattering in scintillator
122 - 2	Duet experiment: Measurement of final state interaction of pion with finely segmented scintillating fibers
123 - 3	Duet experiment: Overview and Detector Performance
124 - 1	Inclusive neutrino cross section measurements at MINERvA
125 - 2	Meson Exchange Current effects in the neutrino oscillation experiments
126 - 3	Study of hadron interactions in OPERA-like bricks
127 - 1	Unified microscopic approach to the lepton-nucleus scattering at intermediate energy transfers
128 - 2	Towards CNS Detection: Low-Energy Ionization Yield in Liquid Argon
129 - 3	Neutrino(Antineutrino) induced single Kaon(Antikaon) production
130 - 1	R&D status of O,C(p,p') and (He,t) experiment at RCNP
131 - 2	Theoretical estimate of the gamma-ray production in neutral-current neutrino-oxygen interactions
132 - 3	Status of MINERνA CCQE measurements
133 - 1	Analysis of CCQE Neutrino Interactions in a Liquid Argon Time Projection Chamber
134 - 2	Recent Results from the ArgoNeuT Experiment
135 - 3	Neutrino Scattering Physics with SciBooNE
136 - 1	Reconstruction of neutrino interaction kinematical parameters using the OPERA target emulsion information
137 - 2	Reactor antineutrinos in the world
138 - 3	Improvements on Monte Carlo Simulation at Daya Bay
139 - 1	Offline System of the Daya Bay Experiment
140 - 2	Calibration and reconstruction of the anti-neutrino detector at Daya Bay
141 - 3	Systematics and Backgrounds in Antineutrinos Detection at Daya Bay
142 - 1	Chi-square Fit of Neutrino Oscillation at Daya Bay
144 - 3	Characteristics of the Double Chooz liquid scintillators

ID	Poster title
145 - 1	The Double Chooz Far Detector
146 - 2	Reactor and antineutrino spectrum calculation for the Double Chooz first phase results
147 - 3	Determining the Lithium-9 production rate from muon capture in the Double Chooz detector
148 - 1	Neutrino Search Using Neutron Capture on Hydrogen in Double Chooz
149 - 2	Towards θ_{13} with the Double Chooz detector
150 - 3	Data Taking and Analysis at RENO
151 - 1	Development of an Antineutrino Detector to Monitor the Operation of a CANDU 6 On-Load Refueled Reactor
152 - 2	Reactor On/Off Monitoring with a Relatively Small and Mobile Plastic Anti-neutrino Detector Array (PANDA)
153 - 3	A Short Baseline Reactor Experiment to Probe the Reactor Antineutrino Anomaly
154 - 1	SBL project at a research reactor
155 - 2	Current status of the ANGRA project: monitoring nuclear reactors with antineutrino detectors
156 - 3	Measuring electronics latencies in MINOS with Auxiliary Detectors.
157 - 1	Improved timekeeping for neutrino time of flight measurements in MINOS
158 - 2	Timing calibration of the OPERA drift tube trigger system
159 - 3	On the neutrino time of flight measurement with LVD
160 - 1	T2K neutrino time of flight study
161 - 2	Evaluating Gadolinium's Action on Detector Systems (EGADS)
162 - 3	Reconstruction in the ND280 at T2K
163 - 1	Development of a radon detector for purified gases
164 - 2	Improvement of the energy resolution of CdTe detectors
165 - 3	Design of a huge water purification system based on the Super-Kamionade system
166 - 1	Develpment of InP solid state detector and liquid scintillator contaning metal complex
167 - 2	The MicroBooNE Physics Program
168 - 3	The Time Projection Chamber for the MicroBooNE experiment at Fermilab

ID	Poster title
169 - 1	Purification system of KamLAND-Zen experiment
170 - 2	DAQ Upgrade in KamLAND
171 - 3	Research and Development towards Multi-PMT Optical Module Prototypes for PINGU
172 - 1	PMT calibration of Daya Bay Experiment
173 - 2	Pileup Background Rejection for SNO+
174 - 3	A Cherenkov light source for the SNO+ liquid scintillator detector
175 - 1	CUORE crystal validation runs: results and extrapolation to CUORE background
176 - 2	Long Term Performance of the MINOS Calibration Procedure
177 - 3	Potential of a Neutrino Detector in the ANDES Underground Laboratory
178 - 1	Calibration and Reconstruction in the NOνA Detectors
179 - 2	The KM3NeT digital optical module
180 - 3	Photomultipliers for the KM3NeT neutrino telescope
181 - 1	Muon veto detector for LENA
182 - 2	The Design of the 50 kt Liquid Scintillator Detector LENA
183 - 3	Physics potential of the next-generation neutrino observatory LENA
184 - 1	Arachne - A web-based event display for education and presentation
185 - 2	Development of the Emulsion Neutrino Spectrometer for future neutrino experiments
186 - 3	Nuclear Emulsion Scanning Facility and Development of Ultra High Speed System in Nagoya University
187 - 1	High sensitivity nuclear emulsion gel - its development and production
188 - 2	Construction & Properties of Acrylic Vessels in the RENO Detector
189 - 3	Calibration Efforts at RENO
190 - 1	Measurement of baselines between reactor and detector, and calculation of reactor neutrino fluxes at RENO
191 - 2	Production of Gd loaded liquid scintillator at RENO
192 - 3	Comparison of muon simulation with data in RENO

ID	Poster title
193 - 1	High-sensitivity Beta Counting System for RI impurity Studies of $SrMoO_4$ Scintillating Bolometer
194 - 2	The MINERvA Test Beam Experiment and Calibrations
195 - 3	A Prototype Detector for Observation of Coherent Neutrino-Nucleus Scattering at a Nuclear Reactor
196 - 1	Simulations for the INO Experiment
197 - 2	WCSim: a Geant4 based water Cherenkov detector simulation
198 - 3	The mini Time Cube: A Portable Directional Neutrino Detector
199 - 1	Radon induced surface contaminations in bolometric arrays for DBD search
200 - 2	The windowless gaseous tritium source of KATRIN
201 - 3	Wavelength-Shifting Plate Light Collectors
202 - 1	Development of scintillating fiber tracker with MPPC for next-generation neutrino detector
203 - 2	Status of the DCBA experiment for neutrinoless double beta decay search
204 - 3	Status of the BAIKAL-GVD project
205 - 1	Measurement of an Effective Quasi-Elastic Axial Mass Parameter in MINOS
206 - 2	An updated search for electron neutrino and antineutrino appearance in MINOS
207 - 3	The KM3NeT photonic readout and data acquisition system
208 - 1	A background measurement campaign for very large scale water and scintillator detectors
209 - 2	The Hyper-Kamiokande Project: Sensitivity of neutrino CP violation research
210 - 3	Studying Neutrino Directionality with Double Chooz
211 - 1	A comparison between Rhenium and Holmium as sources for the measure of the neutrino mass.
212 - 2	Status of geochemical determination of the solar pp-neutrino flux by LOREX
213 - 3	Status of the MARE experiment
214 - 1	Atmospheric Neutrinos and Future Large Liquid Argon Detectors
215 - 2	Precision Measurement of Solar Neutrino Flux with the Borexino Detector
216 - 3	Probing the baryon asymmetry of the universe by experimental searches of sterile neutrinos

ID	Poster title
217 - 1	Coherence and neutrino oscillation experiments
218 - 2	Dynamics of Paired Superradiance: Toward Atomic Neutrino Spectroscopy
219 - 3	Toward Construction of the Unified Lepton-Nucleus Interaction Model from a Few Hundred of MeV to GeV Region
220 - 1	Nuclear medium effects in extracting $sin^2\theta_W$ using Paschos-Wolfenstein relation
221 - 2	Spin light of neutrino in plasma
222 - 3	Hierarchically Acting Sterile Neutrinos
223 - 1	Lepton flavour violation in the supersymmetric inverse seesaw
224 - 2	Neutrino Mass Matrix Composed of M_e and M_u Only
225 - 3	Neutrino flavor oscillations in matter moving with acceleration
226 - 1	Electromagnetic properties of neutrino: a window to new physics
227 - 2	Experiment on detection of coherent neutrino scattering off atomic nuclei
228 - 3	Constraining New Physics with Neutrino-Electron Scattering
229 - 1	Non-thermal Leptogenesis in Quasi-degenerate Neutrinos
230 - 2	Testing the Validity of an Antineutrino Anomaly with High Precision Beta Spectra
231 - 3	TeV-Scale Seesaw with Loop-Induced Dirac Mass Term and Dark Matter from $U(1)_{B-L}$ Gauge Symmetry Breaking.
232 - 1	Dark matter and a suppression mechanism for neutrino masses in the Higgs triplet model
233 - 2	Multi-component Dark Matter in Supersymmetric Radiative Seesaw Model
234 - 3	Coannihilation and Direct Detection of Leptophilic Dark Matter in a Radiative Neutrino Mass Model
236 - 2	Constraining double beta decay matrix elements with transfer reactions in a solid Xe target
237 - 3	TeV-scale Seesaw Model with Fermion Quintuplets
238 - 1	The development of the method for investigating astronomical body soils by neutrino spectroscopy
239 - 2	New physics search at near detectors of future neutrino experiments
240 - 3	Is there an 'LSND anomaly'?

ID	Poster title
241 - 1	Getting the best out of T2K and NOvA
242 - 2	Application of the Feldman-Cousins Method to the Combination of Datasets from Multiple Experiments
243 - 3	Neutrino Diffraction I
244 - 1	Neutrino Diffraction II
245 - 2	The latest Borexino impact on the global analysis of neutrino data
246 - 3	Atmospheric Sterile Neutrinos
247 - 1	Stronger limits for the Violation of Equivalence Principle from atmospheric neutrino data
248 - 2	An alternative parametrization for neutrino mixing
249 - 3	Predicting Theta-13 in June 2012
250 - 1	Δm^2_{13} Measurement using Reactor Complementary Study
251 - 2	Cosmological lepton asymmetry with a nonzero mixing angle θ_{13}
252 - 3	Cosmological neutrino mass constraint from the WiggleZ Dark Energy Survey
253 - 1	Sensitivity Studies for LBNE using GLoBES
254 - 2	Constraining neutrino masses using observations of 21cm radiation
255 - 3	Magnetic dipole moment and keV neutrino dark matter
256 - 1	Taking into account the change of neutrino momentum in matter in Wolfenstein's equation for passing neutrino through matter
257 - 2	Asymmetric Neutrino Reactions from Magnetized Proto-Neutron Stars in fully Relativisitc Framework
258 - 3	The LBNE Near Detector Complex
259 - 1	The three-loop neutrino mass model and its constraints from current experimental data and theoretical bounds
260 - 2	Ricochet: A Coherent Neutrino Scattering Experimental Program
261 - 3	Project X at Fermilab
262 - 1	The LUX Experiment

Abstract ID. 1 - 1

Title	Acoustic Position Calibration in KM3NeT
Author	Alexander Enzenhoefer (Erlangen Centre for Astroparticle Physics)
Co-authors	The KM3NeT Consortium

KM3NeT is a future deep-sea research infrastructure in the Mediterranean that will hold a multi-cubic-kilometre neutrino telescope. It will comprise at least 300 vertical structures of several hundred metres length, called detection units (DUs). Anchored to the sea floor and held taut by submerged buoys, they are free to sway with the sea currents. The relative positions of the photosensors on the DUs need to be determined with a precision of not worse than 20 cm in order to achieve the pointing precision required for neutrino astronomy. To accomplish this the foreseen acoustic system employs acoustic transceivers at fixed positions on the sea floor and acoustic receivers along each DU. The system currently being developed for KM3NeT will employ several innovative technologies and is the subject of this poster.

Abstract ID. 2 - 2

Title	On the capability of the future KM3NeT telescope to detect high-energy neutrinos from Fermi bubbles.
Author	Rosa Coniglione Coniglione (INFN - Laboratori Nazionali del Sud)
Co-authors	The KM3NeT consortium

A recent analysis of the Fermi data provides evidence of the emission of high energy gamma rays (up to 100 GeV) with a high intensity E^{-2} spectrum from two large areas (bubbles) around the Galactic center. The possible origin of high energy gammas from an hadronic mechanism makes these bubbles promising sources for high energy neutrino emission. In this work some predictions, based on Monte Carlo simulations and on the high energy gamma observations, regarding the possible detection of high energy neutrino from the Fermi bubbles with the future KM3NeT neutrino telescope will be presented.

Abstract ID. 3 - 3

Title	KM3NeT sensitivity and discovery potential for galactic point-like sources
Author	P. Sapienza (LNS-INFN)
Co-authors	KM3NeT consortium

The KM3NeT consortium http://www.km3net.org aims at the construction of a cubic-kilometre-scale neutrino telescope for the Northern hemisphere. Detection of galactic sources are a primary goal for KM3NeT that has a visibility of 87%. Models for galactic neutrino sources like SuperNova Remnants and Pulsars are robustly constrained by TeV-gamma observations if γ are emitted from π° decay. At least the more intense sources should be detected by KM3NeT. We report the expectations for the discovery potential for the RXJ1713.7-3946 that is one of the most promising candidate, the estimate for other sources is ongoing.

Abstract ID. 4 - 1

Title	Status of the KM3NeT project
Author	Maarten de Jong (Nikhef)
Co-authors	The KM3NeT Consortium

The primary aim of the KM3NeT project is the detection of high-energy neutrinos from the cosmos. The detection of neutrinos from the cosmos will break new grounds in the search for the origin of cosmic rays and the study of astrophysical particle acceleration. Following the construction and operation of the Antares neutrino telescope, the completion of the EU funded Design Study and Preparatory Phase Study, and the acquisition of substantial funds, the first construction phase of KM3NeT has begun. The construction will start off-shore Sicily, Italy and Toulon, France and will lead to a first detector module with a size similar to that of IceCube.The complete detector will consist of five such detector modules. The status and future prospects of the KM3NeT project will be presented, with emphasis on the discovery potential of neutrino point sources. The synergy with other sciences will be highlighted.

Abstract ID. 5 - 2

Title	Search for Ultra High Energy Neutrino Diffuse Flux with ANTARES Telescope
Author	Laura Core (Centre de Physique des Particules de Marseille)
Co-authors	The ANTARES Collaboration

The search for ultra high energy muon neutrinos in the energy range from 100 PeV to 10 EeV from unresolved sources is presented. Neutrinos of energies greater than PeV are absorbed by the Earth, so the search for the astrophysical signal is restricted near the horizon. UHE events release a large amount of light and have a specific topology: a multidimensional analysis combining variables related to the energy and event shape has been used to discriminate signal from background. The different detector configurations from Dec. 2008 to Dec. 2011 are considered. Here the sensitivity for diffuse flux neutrinos is shown.

Abstract ID. 6 - 3

Title	Search for point sources with the ANTARES neutrino telescope using 2007-2010 data
Author	Antoine Kouchner (University Paris Diderot)
Co-authors	The Antares Collaboration

The ANTARES detector, located 40 km off the French coast, is the largest deep-sea neutrino telescope in the Northern Hemisphere. It consists of an array of 885 photomultipliers detecting the Cherenkov light induced by muons produced by neutrino interactions around the detector. The main goal of ANTARES is to search for point-like sources such as active galactic nuclei, gamma-ray bursters, and several Galactic sources. We present the analysis of the 2007-2010 data used to look for steady sources and the upper limits derived from them.

Abstract ID. 7 - 1

Title	Search for neutrino emission from the Fermi Bubbles with ANTARES
Author	Vladimir Kulikovskiy (INFN Genoa)
Co-authors	The ANTARES collaboration

The analysis of Fermi-LAT data has revealed a large structure so-called Fermi Bubbles emitting gamma rays. One of the most promising explanations includes high-energy neutrinos emission together with the observed gammas with similar flux. The ANTARES telescope is a cosmic neutrino detector. Its location in the Mediterranean Sea favours the observation of the Fermi Bubbles region. The preliminary analysis of the neutrino flux from the Fermi Bubbles with ANTARES data is presented.

Abstract ID. 8 - 2

Title	Preliminary results from the Askaryan Radio Array (ARA) prototype and first station
Author	Jonathan Davies (University College London)
Co-authors	The ARA Collaboration

Ultra High Energy (UHE) neutrinos provide an exciting opportunity to study Particle Physics at energies unobtainable by terrestrial accelerators and also to study Astrophysics using this unique messenger. The Askaryan Radio Array (ARA) is a radio detection experiment designed to detect UHE neutrinos interacting in the Antarctic ice. We will be presenting preliminary results from the first year and half of operation of the initial prototype detector station, and half year operation of the first deployed full station. This will show the operational performance of the first two stations and preliminary analysis of the data taken.

Abstract ID. 9 - 3

Title	ARA - Design and status of the Askaryan Radio Array
Author	Hagar Landsman (Weizmann Institute of Science)
Co-authors	The ARA Collaboration

The Askaryan Radio Array (ARA) is a collaborative effort to construct a Teraton-scale ultra-high energy neutrino detector in deep, radio-transparent ice near Amundsen-Scott station at the South Pole. The design and construction of the first phase (named 'ARA-37') is underway. It will cover an area of about $200km^2$ and is designed to make the first definitive observation of the cosmogenic GZK neutrinos. We will review the design goals, design, expected sensitivities and status of the ARA-37 effort , and discuss some of the challenges in constructing a large area RF detector at the South Pole.

Abstract ID. 10 - 1

Title	Neutrino Radiography with IceCube Neutrino observatory
Author	Kotoyo Hoshina (Earthquake Research Institute, Universit of Tokyo)
Co-authors	Kotoyo Hoshina for the IceCube collaboration, Hiroyuki K.M. Tanaka

Neutrino radiography, detecting absorption of neutrinos in dense matter, has been expected as one of the possible direct measurements of density of the core of the Earth. Considering total column depths of the Earth, atmospheric neutrinos with energy over a few ten TeV will be utilized for this purpose. With IceCube neutrino observatory, we are planning to observe 5-sigma separation between PREM model and core-less Earth model. Analysis techniques are developed and tested with IceCube data taken in recent years. We present the current status of Neutrino Radiography with IceCube and recent results from our analysis.

Abstract ID. 11 - 2

Title	Search for Neutrinos from The Galactic Plane and Other Astrophysical Extended Sources with IceCube
Author	Naoko Kurahashi Neilson (University of Wisconsin Madison)
Co-authors	IceCube Collaboration

The IceCube Neutrino Observatory completed instrumenting a cubic kilometer of ice at the South Pole using 86 strings of optical modules, and started taking data with the full configuration in May 2011. The detector was built over several years and took data while construction progressed. This poster presents the results of searches for astrophysical neutrino signal from extended sources using the combined 40-string and 59-string detector data taken from 2008 to 2010. This includes an all-sky search for hot spots of various extension sizes, as well as a dedicated search for diffuse neutrinos originating from the Galactic Plane.

Abstract ID. 12 - 3

Title	A search for the extremely high energy cosmogenic neutrinos with the IceCube 2010-2011 data
Author	Keiichi Mase (Chiba University)
Co-authors	The IceCube collaboration

Extremely high energy cosmic rays above 5×10^{19} eV inevitably interact with cosmic microwave background photons, and produce extremely high energy neutrinos of 10^{18} eV. Since such neutrinos are neither attenuated nor deflected in the interstellar space, their detection will provide information about the sources of the highest energy cosmic rays. A search for such extremely high energy neutrinos is being performed with the IceCube data taken in 2010-2011 with approximately 90 % of the complete detector. The detail of the analysis and the results will be presented.

Abstract ID. 13 - 1

Title	Searches for Neutrinos from GRBs with IceCube
Author	Erik Blaufuss (University of Maryland)
Co-authors	The IceCube Collaboration

The IceCube Neutrino Observatory, recently completed and instrumenting a cubic-kilometer of ice below the geographic South Pole, is sensitive to high-energy astrophysical neutrinos. This presentation will summarize the status of searches for neutrino emission associated with gamma ray bursts. Searches performed include those optimized for emission time-correlated with the gamma-ray emission observed in satellite detectors and optimized for neutrinos from a Waxman-Bahcall fireball, as well as a model-independent searches optimized for wide range of energies and emission times. With no events found correlated with the observed GRBs, limits on neutrino emission are set and implications for GRBs as the source of the highest energy cosmic rays are discussed.

Abstract ID. 14 - 2

Title	Extending IceCube-DeepCore with PINGU
Author	Darren R Grant (University of Alberta)
Co-authors	The IceCube/PINGU Collaboration

A new in-fill array co-located with IceCube at the South Pole would lower the neutrino energy threshold below that of IceCube-DeepCore to a few GeV. The array, called PINGU (Precision IceCube Next Generation Upgrade), would have sensitivity to atmospheric neutrino oscillations, including tau neutrino appearance, multiple peaks of the oscillation survival probability curve and potentially the sign of the neutrino hierarchy, as well as neutrinos from annihilating very low mass WIMP dark matter. PINGU also provides the opportunity to perform R&D for new photon detection and low energy calibration technologies, potentially establishing the path to a megaton-scale detector capable of detecting signals from proton decay and bursts of supernova neutrinos. The status of the PINGU will be presented.

Abstract ID. 15 - 3

Title	Search for High-Energy Neutrino Point Sources with IceCube
Author	Sirin Odrowski (TU Muenchen)
Co-authors	The IceCube collaboration

One of the primary goals of the IceCube neutrino telescope is the discovery of neutrino point sources. Since high-energy neutrinos can be produced in the interactions of accelerated hadrons but not in competing leptonic processes, the detection of such a source will shed light on the origin of the high-energy cosmic radiation. In this poster, we present the status of a search for neutrino point sources with the IceCube 79-string detector. The analysis makes use of IceCube's potential to search for neutrino sources at any position in the sky. IceCube achieves an unprecedented discovery potential to high-energy neutrino point sources. In addition to a scan of the sky, we include a dedicated search for neutrino emission from the Cygnus region.

Abstract ID. 16 - 1

Title	Deep Underground Astroparticle Physics at SNOLAB
Author	Eric Vazquez-Jauregui (SNOLAB)
Co-authors	

SNOLAB is an underground international facility developed from the SNO experiment focused on dark matter and neutrino experiments. It is located near Sudbury Ontario, Canada in the Vale Creighton mine at a depth of 2 km to shield experiments from cosmic rays and operated under a class 2000 clean environment to mitigate against background contamination. Currently running experiments are COUPP-4kg, PICASSO and DEAP-1; while SNO+, HALO, COUPP-60kg, DEAP-3600 and MiniCLEAN are under construction. The SNOLAB facility construction is complete and competitive detectors are operating, and achieving world leading limits for dark matter searches, in addition, deployment of larger scale experiments is underway. The status of the experimental program is presented in this poster.

Abstract ID. 17 - 2

Title	Nucleus-Survival Bounds on High-Energy Neutrino Backgrounds
Author	Kohta Murase (CCAPP. Ohio State University)
Co-authors	John Beacom

Motivated by Pierre Auger Observatory results favoring a heavy nuclear composition for ultrahigh-energy (UHE) cosmic rays, we investigate implications for the cumulative neutrino background. The requirement that nuclei not be photodisintegrated constrains their interactions in sources, therefore limiting neutrino production via photomeson interactions. We show that the background flux of neutrinos is lower than $E_\nu^2 \Phi_\nu \sim 10^{-9}$ GeV cm^{-2} s^{-1} sr^{-1} if UHE nuclei ubiquitously survive in their sources. This is smaller than the analogous Waxman-Bahcall flux for UHE protons by about one order of magnitude. We also discuss potential sources of UHE nuclei and implications for high-energy neutrino observations by IceCube.

Abstract ID. 18 - 3

Title	ARIANNA - A New Concept for the Detection of GZK Neutrinos
Author	Joulien Tatar (University of California Irvine)
Co-authors	Steven Barwick

Dedicated high-energy neutrino telescopes based on optical Cherenkov techniques have been scanning the cosmos for about a decade. Consequently, neutrino flux limits have improved by several orders of magnitude in the TeV-PeV energy interval. At higher energies, detectors using radio Cherenkov techniques have produced aggressive limits on the neutrino flux. We describe a novel concept for the next generation of astrophysical neutrino detection, called ARIANNA, which takes advantage of unique geophysical features of the Ross Ice Shelf in Antarctica. ARIANNA, based on the radio Cherenkov technique, is designed to improve the sensitivity to neutrinos with energies in excess of 10^{17} eV.

Abstract ID. 20 - 2

Title	Performance and Status of the HAWC Gamma-Ray Observatory
Author	Jordan Goodman (University of Maryland)
Co-authors	The HAWC Collaboration

HAWC is a very high-energy gamma-ray observatory with a wide field-of-view currently under construction in Mexico. The HAWC observatory will have unique capabilities with which to study the high-energy sky. In this poster, we will describe the status and the expected performance of the HAWC observatory. In addition we will show that a) HAWC will measure galactic gamma-ray sources above a TeV with a sensitivity comparable to the Fermi LAT above a GeV and b) HAWC has a realistic opportunity to observe the high-energy power law components of GRBs that extend at least up to 30 GeV, as it has been observed by Fermi LAT. HAWC will provide information about the high-energy spectra of gamma-ray sources which is critical to establishing likely sources of hadron acceleration.

Abstract ID. 21 - 3

Title	The Tianshan Radio Experiment for Neutrino Detection
Author	J. Deng (NAOC)
Co-authors	O. Martineau-Huynh, V. Niess for the TREND collaboration

The Tianshan Radio Experiment for Neutrino Detection (TREND) is an antenna array performing autonomous detection of Extensive Air Showers (EAS) through their radio emission. TREND is situated at 2700m above sea level on the site of the 21CMA radio-interferometer, in a remote valley of the Tianshan mountain in China. This site is very well suited for the detection of ultra-high energy cosmic tau neutrinos where earth-skimming neutrinos or those crossing the mountains could induce detectable EAS. We present here an end-to-end Monte-Carlo simulation able to compute the detection probability by an antenna array placed at the TREND site for each given neutrino trajectory and energy. The full chain of processes is simulated and a neutrino sensitivity for a giant telescope array is estimated.

Abstract ID. 22 - 1

Title	The physics potential of the diffuse supernova neutrino background
Author	Shunsaku Horiuchi (Ohio State University)
Co-authors	John Beacom, Eli Dwek, Christopher Kochanek, Jose Prieto, Kris Stanek, Todd Thompson

The Diffuse Supernova Neutrino Background (DSNB) provides an immediate opportunity to study the emission of MeV thermal neutrinos from core-collapse supernovae (CCSN). The DSNB is a powerful probe of stellar as well as neutrino physics. However it requires detailed knowledge of the CCSN rate history. With this motivation, the CCSN rate is investigated. We perform crosschecks with various astrophysical observables, and quantify the effects of input physics. We evaluate the detectability of the DSNB and the potential of studying stellar and neutrino physics at current and future neutrino detectors.

Abstract ID. 23 - 2

Title	Supernova neutrino monitor at Super-Kamiokande
Author	Hirokazu Ishino (Okayama University)
Co-authors	The Super-Kamiokande Collaboration

We present a Supernova (SN) real time monitor at Super-Kamiokande phase IV (SK-IV). It monitors SN neutrino bursts in real time by searching for an event cluster in certain time windows with a lower energy threshold of 7 MeV. We present details of the system and its performance such as the response time. It is very important to determine the SN direction using only neutrinos that come earlier than the light by a few hours. We have developed a maximum likelihood method for the SN pointing. We present its performance including the pointing accuracy obtained with a study based on simulations. Finally, we present a result of the SN search using the offline SK-IV data.

Abstract ID. 24 - 3

Title	Study of low energy electron anti-neutrinos at Super-Kamiokande IV
Author	Haibing Zhang (Tsinghua University)
Co-authors	The Super-Kamiokande Collaboration

A novel trigger scheme has been implemented in Super-Kamiokande (SK) IV to search for the 2.2 MeV gammas resulting from neutron captures on free protons. The neutron tagging efficiency is found to be $(19.3 \pm 1.0)\%$, verified with an Am/Be source. The accidental background probability is evaluated using real data and is $(1.0 \pm 0.1)\%$ per 500 microseconds of data. This newly established technique has been applied at SK-IV to study low energy electron anti-neutrinos. Results of searches for supernova relic neutrinos and possible solar anti-neutrinos are presented. Prospects of neutron tagging in SK-IV and beyond are discussed.

Abstract ID. 25 - 1

Title	Supernova detection with IceCube and beyond
Author	Ronald Bruijn (Ecole Polytechnique Federale de Lausanne)
Co-authors	The IceCube Collaboration

The IceCube neutrino detector, located in the ice at the South Pole, is used as a supernova detector. For a core collapse supernova within our galaxy, it will provide the highest statistics of all operating detectors. The standard detection method relies on the recording of a collective rise in count rate of all photomultipliers due to the interactions of many MeV neutrinos. Signal significance is limited by the noise floor of the photomultipliers. In this paper we give an update on a method that uses additional information from coincident hits from individual interacting neutrinos to estimate the average neutrino energy. We also discuss the background from correlated hits due to cosmic ray muons. The methods are evaluated for a proposed low-energy extension with a higher sensor density than DeepCore.

Abstract ID. 26 - 2

Title	SNOwGLoBES: SuperNova Observatories with GLoBES
Author	Kate Scholberg (Duke University)
Co-authors	

This poster will describe software for computing interaction rates and distributions of observed quantities for supernova burst neutrinos in common detector materials. The intent is to provide a public package which can be used for simple tests of observability of physics signatures in current and future detectors. The event estimates are made using the best available cross-sections and parameterized detector responses. SNOwGLoBES makes use of GLoBES front-end software.

Abstract ID. 27 - 3

Title	Low energy performances and coherent detection of supernova neutrinos in CUORE-0 and CUORE experiment
Author	Matteo Biassoni (Universita di Milano Bicocca and INFN - Sezione di Milano Bicocca)
Co-authors	CUORE Collaboration

Thanks to a trigger algorithm based on the optimum (matched) filter technique CUORE experiment will be able to lower the energy threshold and detect neutrinos from type II supernovae via the observation of the recoil energy (few to tens of keV for a MeV neutrino) of a scattered target nucleus (ν-nucleus NC coherent scattering is a phenomenon relatively well known but never observed experimentally). The studies on the sensitivity to supernova neutrino show that a supernova at 7kpc should be detected with high efficiency. A real time supernova trigger has been developed and tested on CUORE-0 (the first CUORE tower).

Abstract ID. 28 - 1

Title	HALO - a new lead-based dedicated supernova detector
Author	Clarence Virtue (Laurentian University)
Co-authors	The HALO Collaboration

The Helium and Lead Observatory is a dedicated supernova detector located at SNOLAB, and is the first detector to use lead as an interaction medium for supernova neutrinos. The large neutron excess of lead acts to Pauli-block p to n transitions completely suppressing $\overline{\nu_e}$ charged-current interactions. HALO's sensitivity to ν_e charged-current interactions is significantly Coulomb-enhanced by the high Z of the lead nucleus making lead tonne for tonne a very cost effective and compact target for supernova neutrinos. Together with sensitivity to the ν_μ and ν_τ components of the spectrum via neutral-current interactions, HALO can provide strong sensitivity to flavour swapping and spectral splitting due to MSW-like collective $\nu - \nu$ interactions in a supernova core.

Abstract ID. 29 - 2

Title	Towards an extragalactic Supernova neutrino detector at the South Pole
Author	Markus Voge (University of Bonn)
Co-authors	Nora-Linn Strotjohann, Sebastian Boeser, Marek Kowalski

Detection of supernova neutrinos provides valuable information on physical processes during the supernova. For a routine detection of SN neutrinos, effective masses of several megatons are required in order to be sensitive to SNe in our neighbor galaxies. Because of good optical qualities, the South Pole ice may offer an adequate medium for such a detector. We present conceptual studies for a possible future Cherenkov array at the South Pole with a target mass of 9 Mtons, allowing to detect about 1-2 SNe per year.

Abstract ID. 30 - 3

Title	The long term variation of supernova neutrino spectra
Author	Ken'ichiro Nakazato (Faculty of Science & Technology, Tokyo University of Science)
Co-authors	Tomonori Totani, Hideyuki Suzuki

In this study, we investigate long term variations of the supernova neutrino spectra by the numerical simulations. Combining the results of the general relativistic neutrino radiation hydrodynamics (for several times 100 msec after the core bounce) and quasi-static proto-neutron star cooling for the late phase (for $\sim$20 sec after the core bounce), the perspective models for the supernova neutrino signal are constructed. Moreover we are planning the construction of the systematic database of the supernova neutrino signal which is available as comparable templates for the future detection. Since we compute for the several progenitor models with various masses and metalicities, a prediction for the spectra of supernova relic neutrinos would be possible. We will also report the current status of this project.

Abstract ID. 31 - 1

Title	Systematic study of supernova neutrino oscillation using outputs of supernova simulations
Author	Hideyuki Suzuki (Tokyo University of Science)
Co-authors	H. Suzuki, H. Kikuchi, M. Kuno, K. Nakazato, K. Sumiyoshi, and S. Yamada

We investigated supernova neutrinos emitted during both the dynamical phase and the quasistatic cooling phase using spherically symmetric simulations. In order to reproduce explosions, we performed additional simulations with phenomenological enhancement of neutrino heating. We adopt obtained neutrino spectra and density profiles as inputs for our study of neutrino oscillations. We discuss resultant supernova neutrino spectra as well as their dispersion concerning various explosion stages, progenitors and so on.

Abstract ID. 32 - 2

Title	Solar neutrino results of Super-Kamiokande IV
Author	Takaaki Yokozawa (Institute for Cosmic Ray Research)
Co-authors	The Super-Kamiokande Collaboration

Results of the fourth phase of the Super-Kamiokande (SK) solar neutrino measurements are presented. The main goal of SK's solar analysis is to observe the MSW effect. Following improvement of the detector's water circulation system and lowering of the trigger threshold, low energy background levels have been reduced and clear solar neutrino signals are seen for 4.0-4.5 MeV (kinetic) electron energies, along with some indications of a signal even down to 3.5-4.0 MeV. The combined energy spectrum and day/night solar neutrino flux from SK-I through SK-IV will be presented. A global oscillation analysis has been carried out using SK-I, II, III, and IV data and combining these results with the results of other solar neutrino experiments as well as the KamLAND reactor experiment.

Abstract ID. 33 - 3

Title	A wide-band solar neutrino trigger for Super-Kamiokande
Author	Giada Carminati (University of California, Irvine)
Co-authors	The Super-Kamiokande Collaboration

The Super-Kamiokande (SK) experiment observes the elastic scattering of ^{8}B solar neutrinos on electrons. The transition region between vacuum and matter oscillations (with neutrino energy near 3 MeV) is currently still unexplored with high precision in SK due to 4.5 MeV kinetic energy threshold of the recoil electron. To study this intermediate regime, the trigger threshold can be lowered at 3.5 MeV taking advance of the latest DAQ electronics. A new software trigger, the Wide-band Intelligent Trigger (WIT), has recently been developed to simultaneously trigger and reconstruct very low energy electrons (above 3.5 MeV) with an efficiency close to 100%. Prospects for a more powerful system able to reach SK's energy reconstruction limit of 2.5 MeV are presented as well.

Abstract ID. 34 - 1

Title	The Hyper-Kamiokande Project: Sensitivity for low-energy neutrinos
Author	Yasuo Takeuchi (Dept. of Physics, Grad. School of Science, Kobe University)
Co-authors	The Hyper-Kamiokande working group

Hyper-Kamiokande (Hyper-K, HK) is a next generation underground water Cherenkov detector. In this presentation, I would like to report sensitivity studies on low-energy neutrinos, especially solar neutrinos and supernova neutrinos. Hyper-K could be used for variability analyses of the Sun. In spite of smaller photo coverage and less overburden, better statistical measurements of solar neutrinos than SK could be done in HK detector. Hyper-K also has a good sensitivity for the supernova burst neutrinos. If a core collapse supernova explosion occurs at 10 kpc distance, the HK detector would detect approximately 170,000 - 260,000 neutrinos within about 10 seconds. For the supernova relic neutrinos, Hyper-K could observe a few hundreds events in 10 years in 20-30 MeV energy region without neutron tagging.

Abstract ID. 35 - 2

Title	Low Energy Neutrino Spectrometer (LENS)
Author	S. Derek Rountree (Virginia Tech)
Co-authors	Vogelaar, Pitt, Hu, Papp, Manecki, Yokley, Wright, Wolf, Jaffke, Robinson, Heimburger, Blackmon, Rasco, Afanasieva, Yeh

LENS is a low-energy neutrino (ν) experiment that will measure the solar ν spectrum (LENS-Sol) above 115keV via charge-current capture on In115 which accounts for 95 % of the solar ν flux. The LENS-Sol experiment requires a high spatial resolution for background suppression. The method for obtaining this high resolution in the LENS-Sol detector is a scintillation lattice (SL). The SL allows for isotropically emitted light to be channeled down the three Cartesian coordinates, thus producing a digitally resolved position on all faces of the detector. The SL has given rise to other uses for the LENS detection volume in the areas of both sterile ν and the majorana nature of the ν. We will present LENS-Sol, and the basic concepts of LENS-Sterile and LENS-$\beta\beta$. Supported by the National Science Foundation.

Abstract ID. 36 - 3

Title	Prototyping for A Low Energy Neutrino Spectrometer (LENS)
Author	B. Charles Rasco (Louisiana State University)
Co-authors	The LENS Collaboration

LENS is a low energy neutrino experiment that has the primary objective of measuring the solar neutrino spectrum (LENS-Sol) above 114keV. LENS-Sol takes advantage of charged-current capture of neutrinos on ^{115}In, with prompt emission of an e- and delayed emission of 2 γ rays that serve as a time/space coincidence tag. The first incarnation of LENS is called microLENS. microLENS consists of a 6x6x6 Teflon lattice structure filled with liquid scintillator. The lattice structure channels light generated by the scintillator and thereby allows position information to be extracted, which is required to identify the LENS-Sol tag. Simulations, data, and preliminary results will be discussed. This work is supported by the National Science Foundation and Department of Energy.

Abstract ID. 37 - 1

Title	Backgrounds and Solar Neutrinos in SNO+
Author	Valentina Lozza (INSTITUT FUER KERN- UND TEILCHEN-PHYSIK - Technical University Dresden)
Co-authors	The SNO+ Collaboration

SNO+ is the follow up of the SNO experiment with ∼780 t of Linear AkylBenzene (LAB) as active volume. The high light yield, the 6000 m.w.e. rock shielding and the use of ultra-clean materials makes the detector suitable for neutrinos studies. The main physics goals are the detection of pep and CNO solar νs, geo-νs, the study of reactor oscillation, and supernovae νs watch. Complementing this program, LAB will be loaded with 0.1% ^{nat}Nd (then up to 0.3%), for the study of ^{150}Nd (5.6% nat. abundance) $0\nu\beta\beta$-decay. To explore all the physics goals, a key role is played by the background reduction, selecting low radioactivity content materials and purifying the LAB. In addition, to increase the detector sensitivity, coincidences studies and tagging techniques are under investigation.

Abstract ID. 38 - 2

Title	Mass Hierarchy Study with MINOS Far Detector Atmospheric Neutrinos
Author	Xinjie Qiu (Stanford University)
Co-authors	Andy Blake, Luke A. Corwin, Tingjun Yang, Stan Wojcicki, Alec Habig, Stuart Mufson

Neutrino oscillation probabilities are significantly modified by matter effects as the neutrinos propagate through the Earth. Matter effects have opposite signs for neutrinos vs. antineutrinos, and for normal vs. inverted mass hierarchies. Neutrino-induced muon charge discrimination is done by the magnetized detector. Analysis techniques using atmospheric neutrinos in the MINOS far detector for potential neutrino mass hierarchy determination are presented in this poster.

Abstract ID. 39 - 3

Title	Observations of Atmospheric Neutrinos and Anti-neutrinos by the MINOS Experiment
Author	Brian Rebel (Fermilab)
Co-authors	ANDREW BLAKE, LUKE CORWIN, XINJIE QIU, ALEC HABIG, STUART MUFSON

The MINOS far detector has been collecting atmospheric neutrino data since 2003. The detector is magnetised, enabling the separation of muon neutrinos and anti-neutrinos. This poster presents the latest MINOS atmospheric neutrino results, based on 2553 live-days of data collected up to March 2011. The results combine observations of contained vertex interactions and neutrino-induced up-going muons. A fit to the observed L/E distributions is used to determine the oscillation parameters separately for neutrinos and anti-neutrinos.

Abstract ID. 40 - 1

Title	Atmospheric neutrino oscillations with IceCube/DeepCore
Author	Andreas Gross (TU Munich)
Co-authors	The IceCube collaboration

IceCube is a cubic kilometer scale neutrino telescope completed in December 2010 optimized for neutrino energies on the TeV to PeV scale. With the more densely instrumented DeepCore detector in the center, the performance in the 10 GeV to 1 TeV energy range has been improved significantly. We discuss the capabilities of IceCube/DeepCore to measure atmospheric neutrino oscillations. The status of an analysis for muon neutrino disappearance using IceCube in the 79-string configuration is presented. The maximum effect is predicted around 25-30 GeV neutrino energy for up-going events. This analysis reduces the impact of systematic errors by comparison to a non-oscillating event selection at higher energies. An outlook to expected future improvements is given.

Abstract ID. 41 - 2

Title	Full three-flavor oscillation analysis of atmospheric neutrino data observed in Super-Kamiokande
Author	Ka Pik Lee (ICRR, University of Tokyo)
Co-authors	The Super-Kamiokande collaboration

Oscillation analysis with atmospheric neutrinos observed in Super-Kamiokande is carried by considering the entire set of oscillation parameters: two mass differences Δm^2_{12}, Δm^2_{23}, sign of Δm^2_{23}, three mixing angles θ_{12}, θ_{23} and θ_{13}, CP phase parameter δ_{CP}. To enhance the sensitivity to the mass hierarchy, ν and anti-ν enriched samples were developed. The models for neutrino interactions and pion interactions in our Monte-Carlo simulation are updated based on external experimental data. This study aims to determine θ_{13}, mass hierarchy and octant of θ_{23}.

Abstract ID. 42 - 3

Title	The Hyper-Kamiokande Project: Sensitivity for proton decay searches
Author	Makoto Miura (Kamioka observatory, ICRR, Univ. of Tokyo)
Co-authors	The Hyper-Kamiokande working group

The proton decay search is the most important probe of GUTS. The proton decay search needs huge number of proton and the water cherenkov detector is a suitable tool. The Super-Kamiokande detector is running more than 15 years, but the proton decay signal has not been found yet. The current lower limit of the proton lifetime in $p \to e^+\pi^0$ has been exceeded 10^{34} year. To explore further region, it is clear that we need more larger detectors. The Hyper-Kamiokande is a water cherenkov detector in the next generation. I will discuss sensitivity of the proton decay searches by the base design of the Hyper-Kamiokande.

Abstract ID. 43 - 1

Title	Towards a background-free KATRIN spectrometer
Author	Susanne Mertens (Karlsruhe Institute of Technology)
Co-authors	The KATRIN collaboration

The KATRIN experiment is designed to probe the absolute neutrino mass scale from the kinematics of tritium β-decay. KATRIN will analyze the shape of the tritium β-spectrum in a narrow region close to the tritium endpoint where the influence of a nonzero neutrino mass is maximal. To reach the design sensitivity of 200 meV, high energy resolution, high signal count-rates and especially ultra-low background of 10 mHz are required. The poster will explain the main background sources and novel active background reduction techniques. It will show how a complimentary combination of simulations and experiments were performed to take an initial kHz level background down to the sub-mHz regime.

Abstract ID. 44 - 2

Title	Calibration and stability monitoring of the KATRIN experiment
Author	Stephan Bauer (University of Muenster)
Co-authors	The KATRIN Collaboration

To determine the neutrino mass scale with sub-eV sensitivity the KATRIN (KArlsruhe TRItium Neutrino) experiment measures the tritium beta spectrum in the endpoint region. In order to reach the desired sensitivity, the retarding potential of the MAC-E-Filter of -18.6 kV must be monitored with a precision of 60 mV. Two different methods will be used to achieve that goal. On the one hand two ppm precision high voltage dividers for voltages up to 65 kV were developed in cooperation with the German national metrology institute PTB. On the other hand the spectrometer of the former Mainz Neutrino mass experiment has been modified to monitor ^{83m}Kr conversion electron lines of implanted $^{83}Rb/^{83m}Kr$ sources as a natural standard. This work is supported by the German Federal Ministry BMBF.

Abstract ID. 45 - 3

Title	Towards a Neutrino Mass Measurement: First Data from the Project 8 Prototype
Author	Noah Oblath (Massachusetts Institute of Technology)
Co-authors	The Project 8 Collaboration

The Project 8 collaboration aims to measure the neutrino mass using tritium beta decays. Beta-decay electron energies will be measured with a novel technique: using cyclotron radiation to detect the energy of an electron. We have constructed a prototype device to investigate the feasibility of the new technique. The ability to see the conversion electrons from a ^{83m}Kr source will demonstrate the utility of the technique for detecting tritium beta-decay electrons. This poster highlights the initial data collection with the prototype, the analysis techniques under investigation, and future plans for the experiment.

Abstract ID. 46 - 1

Title	The Ho-163 EC Decay to Measure the Electron Neutrino Mass in the framework of MARE
Author	Maria Ribeiro Gomes (Centre for Nuclear Physics, University of Lisbon, Portugal)
Co-authors	MARE Collaboration

An alternative for MARE-Microcalorimeter Array for a Rhenium Experiment is to use the Ho-163 EC decay to measure the electron neutrino mass. The isotope is embedded in the microcalorimeters absorber for a high efficiency measurement. The best current absorber candidate is Au that has already demonstrated high energy resolution and thermalization speed performances. In this paper, we will show the experiments concept and roadmap to reach a sensitivity of 0.1 eV/c2, discuss its technical requirements and preliminary results.

Abstract ID. 47 - 2

Title	Backgrounds for KamLAND-Zen experiment
Author	Haruo Ikeda (Research center for neutrino science, Tohoku university)
Co-authors	The KamLAND-Zen collaboration

KamLAND-Zen is zero neutrino double beta decay search experiment using ^{136}Xe modified in existing KamLAND detector. The double beta decay source and detector is 13 ton of Xe loaded liquid scintillator. The backgrounds for double beta decay observations have several types like radioactive impurities, ^{10}C from cosmic ray muon, and unexpected fallout materials from Fukushima-1 disaster. This poster reports these backgrounds estimation and measurement in Xe loaded liquid scintillator and inner balloon using KamLAND-Zen data, MC simulations and HPGe detector measurements.

Abstract ID. 48 - 3

Title	^{10}C Background Reduction by MoGURA for KamLAND-Zen
Author	Hisataka Yoshida (Research Center for Neutrino Science, Tohoku University)
Co-authors	KamLAND-Zen Collaboration

KamLAND-Zen is an experiment for neutrino-less double beta decay ($0\nu\beta\beta$) search with KamLAND Detector and 300kg of ^{136}Xe. The decay of ^{10}C is one of the most serious background for $0\nu\beta\beta$ spectrum. ^{10}C is generated by cosmic muon spallation with neutron in 90 % probability, so it can be tagged by delayed coincidence with these 3 events. **MoGURA** is dead-time-free electronics system which developed and used for KamLAND detector. MoGURA can detect all neutron after cosmic muon. I will present current status of ^{10}C data by MoGURA and reduction efficiency for KamLAND-Zen.

Abstract ID. 49 - 1

Title	Energy and Vertex Calibration and Background estimation in KamLAND-Zen
Author	Sayuri Matsuda (RCNS)
Co-authors	KamLAND-Zen Collaboration

KamLAND-Zen is $0\nu\beta\beta$ decay search experiment with ^{136}Xe-loaded liquid scintillator (Xe-LS). This observation would definitively establish the Majorana nature of the neutrino. Assuming secular equilibrium, ^{238}U and ^{232}Th concentrations in the Xe-LS are estimated to be 3.5×10^{-16} g/g and 2.2×10^{-15} g/g respectively. It's about 100 times more than expected. Energy response is calibrated with ^{214}Bi from ^{222}Rn introduced during detector modification and γ's from ^{208}Tl source. The vertex resolution is estimated from radial distributions of ^{134}Cs by fallout from Fukushima-I reactor accident in March 2011.

Abstract ID. 50 - 2

Title	Next Phase of KamLAND-Zen
Author	Ryota Matsuda (RCNS)
Co-authors	The KamLAND-Zen collaboration

We are planning two projects as the next phase of KamLAND-Zen, neutrinoless double beta decay search experiment using 330kg of enriched ^{136}Xe. One is KamLAND2-Zen containing 1,000kg of enriched ^{136}Xe and light concentrator around PMTs. Another is KamLAND-Zen with pressurized xenon, dissolving 800kg xenon gas by pressurizing at 1.8atm. To realize pressurized xenon phase, new xenon loaded LS is necessary, because xenon gas dissolution involves density increasing of LS and light yield decreasing. In this poster, we present a summary about KamLAND-Zen pressurized xenon as a next phase of KamLAND-Zen, and possible new LS.

Abstract ID. 51 - 3

Title	CANDLES - Search for neutrino-less double beta decay of ^{48}Ca
Author	Saori UMEHARA (Osaka University)
Co-authors	CANDLES Collaboration

CANDLES is the project to search for neutrino-less double beta decay ($0\nu\beta\beta$) of ^{48}Ca. We installed the CANDLES III system, which contained 350 g of ^{48}Ca without enrichment, at the Kamioka underground laboratory and started a $0\nu\beta\beta$ measurement in 2011. In this March, we installed a light-concentration system to a good energy resolution. A photo-coverage will be about twice larger than the one without the light-concentration system. Here we will report the result of the measurement in 2011 and the expected sensitivity with the light-concentration system.

Abstract ID. 52 - 1

Title	Recent Results of the COBRA Experiment
Author	Christian Oldorf (University of Hamburg)
Co-authors	the COBRA Collaboration

The COBRA experiment uses CdZnTe semiconductor detectors to search for neutrinoless double beta decays. The main focus is on the isotope ^{116}Cd, with a decay energy of 2813.5 keV well above the highest naturally occurring gamma lines. Also ^{130}Te and ^{106}Cd, a double β^+ emitter, are under investigation. The test set–up at the LNGS underground laboratory has recently been upgraded. The new FADC readout allows for background reduction by pulse–shape analysis and first results will be shown. Prior to installation at LNGS, all detectors are scanned with a collimated ^{137}Cs source to determine charge collection efficiency and energy resolution. 32 CdZnTe detectors are currently operated at LNGS, 32 more detectors will be installed in 2012.

Abstract ID. 53 - 2

Title	R&D Activities of COBRA for a Large Scale Experiment
Author	Nadine Heidrich (University of Hamburg)
Co-authors	The COBRA Collaboration

COBRA is a double beta decay experiment using CdZnTe semiconductor detectors. In addition to commercially available CPG detectors, pixaleted detectors are under investigation. This adds tracking capabilities to pure energy measurements of CPGs, which is quite unique in the field. Background measurements from three different systems will be shown. With respect to a future large scale set–up, a broad R&D program is carried out including the operation of bare CPGs in liquid scintillator, the Dortmund Low Background facility for material screening, investigations in crystal growth and enrichment and MC simulation to determine an appropriate passive shielding design. MC simulations concerning the neutron shielding will be tested with a DT–TT neutron generator located in Dresden–Rossendorf.

Abstract ID. 54 - 3

Title	Neutrinoless Double Beta Decay with SNO+
Author	Jeffrey Hartnell (University of Sussex)
Co-authors	

SNO+ will search for neutrinoless double beta decay by loading 780 tonnes of linear alkylbenzene liquid scintillator with O(tonne) of neodymium. Using natural Nd at 0.1% loading will provide 43.7 kg of ^{150}Nd given its 5.6% abundance and allow the experiment to reach a sensitivity to the effective neutrino mass of 100-200 meV at 90% C.L in a 3 year run. The SNO+ detector has ultra low backgrounds with 7400 tonnes of water shielding and self-shielding of the scintillator. Distillation and several other purification techniques will be used with the aim of achieving Borexino levels of backgrounds. The experiment is fully funded and data taking with light-water will commence in 2012 with scintillator data following in 2013.

Abstract ID. 55 - 1

Title	Search of neutrino-less double beta decay of Neodymium 150 in the NEMO3 experiment
Author	Sophie Blondel (Laboratoire de l'Accelerateur Lineaire)
Co-authors	The NEMO3 Collaboration

The NEMO3 experiment has taken data from 2003 to 2011 in the Modane Underground Laboratory (France). Its goal is the search for the neutrino-less double β decay in order to prove that the neutrino is a Majorana particle. The tracko-calo technology allows this detector to well separate between background and signal contributions. No evidence of neutrino-less has yet been shown. The double β decay with neutrinos emission, allowed by the Standard Model, has been measured for 7 different isotopes and I will focus especially on the analysis of the Neodymium 150.

Abstract ID. 56 - 2

Title	The status of the SuperNEMO experiment
Author	Justin Evans (University College London)
Co-authors	Robert Flack, Stefano Torre

SuperNEMO is a 100kg Se82 double beta decay experiment. It has the unique ability to reconstruct the topology of the event providing a smoking gun signal for neutrinoless double beta decay. The experiment is under construction and the first (demonstrator) module will be installed in the Modane Underground Laboratory in 2013. Each module has three parts, the source foil, tracker and calorimeter. Construction has started by building 192 optical modules for the calorimeter. We will summarise the construction and the characterisation of the completed modules. The calorimeter will be calibrated using Bi207 sources and an LED light injection system. Finally, the results of a GEANT4 detector simulation will be reported showing the physics reach of the demonstrator and the full SuperNEMO detector.

Abstract ID. 57 - 3

Title	A low-background large-scale gas tracker for SuperNEMO
Author	James Mott (University College London)
Co-authors	NEMO Collaboration

SuperNEMO is a $0\nu\beta\beta$ experiment with a design sensitivity of $\langle m_{\beta\beta}\rangle = 50$ - 100 meV. Reconstruction of event topologies allows for efficient background rejection and may provide insights into the $0\nu\beta\beta$ mechanism. As a result, a large-scale low-background gas tracker is being developed for inclusion in the detector. This will consist of 2000 stainless steel wire cells, surrounded by a mixture of 95% helium, 4% alcohol and 1% argon. A 90-cell prototype has established that 98% efficiency is achievable and positional resolution for each cell can be as low as 0.7 mm and 1.0 cm in the radial and longitudinal directions respectively. To reduce the chance of contamination during the manufacturing process a wiring-robot has been developed which will allow for a large degree of automation in the production process.

Abstract ID. 58 - 1

Title	The Muon Veto of the GERDA $0\nu\beta\beta$ Experiment
Author	Kai Freund (Eberhard Karls Universitat Tubingen)
Co-authors	Peter Grabmayr, Josef Jochum, Christopher Schmitt, Katharina von Sturm

The GERDA experiment aims to measure the $0\nu\beta\beta$ decay in ^{76}Ge. Despite its location in the LNGS laboratory with 3500 m.w.e. of rock overburden, sufficient cosmic muons are able to penetrate the experiment to cause a non-negligible background for this extremely rare decay. For this reason, GERDA is equipped with a powerful muon veto system. It consists of a water Cherenkov tank surrounding the Germanium cryostat and a layer of scintillation panels covering a weak spot in the Cherenkov veto. This poster will introduce the muon veto system, summarize the first year of data taking and report on its stability and efficiency.

Abstract ID. 59 - 2

Title	Development of a liquid argon scintillation veto for GERDA
Author	Mark Heisel (Max-Planck-Institut fur Kernphysik)
Co-authors	The GERDA collaboration

GERDA operates bare germanium detectors in a cryostat with 64 m^3 of liquid argon (LAr). It has been demonstrated in the LArGe test facility, that the detection of argon scintillation light can be used to effectively suppress background of the germanium detectors. Suppression factors up to 10^3 have been achieved for individual gamma sources. Based on these results, GERDA pursues several options for the light read-out of LAr: the poster presents the main approaches based on photomultiplier tubes, silicon photomultipliers coupled to wavelength shifting fibres, and/or avalanche photodiodes. Their expected performance is studied and optimized in a Monte Carlo campaign. At the same time the development of hardware components is progressing towards testable prototypes.

Abstract ID. 60 - 3

Title	Surface background suppression in BEGe detectors for GERDA Phase II
Author	Dušan Budjáš (Technische Universitaet Muenchen)
Co-authors	M. Agostini, A. Lazzaro, M. Barnabé Heider, T. Bode and S. Schönert for the GERDA collaboration

In Phase II of the GERDA experiment additional ∼20 kg of BEGe detectors, enriched in ^{76}Ge, will be deployed in liquid argon to increase the sensitivity for the half-life of neutrinoless double beta decay of ^{76}Ge to $> 2 \cdot 10^{26}$ y. The required background level is 10× lower than the goal of Phase I, i.e. $< 10^{-3}$ cts/(kg·y·keV). GERDA Phase I observed betas from ^{42}Ar progeny ^{42}K penetrating the ∼mm thick n+ electrode and alphas from e.g. ^{210}Po passing through the thin ($< \mu m$) p+ electrode, generating background in the region of interest at 2039 keV ($Q_{\beta\beta}$ energy of ^{76}Ge) at rates potentially dangerous for Phase II. Experimental results showing efficient suppression of events from both n+ and p+ surfaces of BEGe detectors via pulse shape analysis will be presented, as well as their estimated contribution to the background level of GERDA Phase II.

Abstract ID. 61 - 1

Title	The LUCIFER project: a scintillating bolometer array for search for Neutrinoless Double Beta Decay
Author	Filippo Orio (INFN Sezione di Roma)
Co-authors	LUCIFER Collaboration

The quest for Neutrinoless Double Beta Decay (0νDBD) represents the most promising way to assess the neutrino mass nature, Dirac or Majorana. The LUCIFER project, financed by an ERC-AdG, aims to search for ^{82}Se 0νDBD by means of an array of ZnSe scintillating bolometers. As in other rare processes searches, the greatest obstacle to improve the experimental sensitivity is the achievable background level. The simultaneous read-out of heat and scintillation light signals allows to discriminate between α background and β/γ's, providing a background lower than 0.001 counts/kg/keV/year in the ROI. The use of ^{82}Se enriched crystals will provide an additional improvement of the sensitivity. The current status of LUCIFER project as well as the recent results of R&D on ZnSe crystals will be presented.

Abstract ID. 62 - 2

Title	AMoRE project
Author	Yong-Hamb Kim (KRISS)
Co-authors	AMoRE collaboration

AMoRE (Advanced Mo based Rare process Experiment) collaboration develops high sensitivity cryogenic scintillating detectors, based on enriched in ^{100}Mo and depleted in ^{48}Ca calcium molybdate crystals, to search for neutrinoless double beta decay of ^{100}Mo. Several $^{40}Ca^{100}MoO_4$ crystals with mass of 0.5 kg were successfully grown. Their scintillation properties and internal backgrounds were tested in Y2L. Cryogenic experiments have been carried out to achieve high energy resolution and active discrimination of backgrounds using phonon and light measurement channels. The project aim is to use 100 kg of $^{40}Ca^{100}MoO_4$ crystals running in a phonon/light coincidence mode at $\sim$20 mK. The half-life sensitivity of such the experiment after three years of measurement is estimated to be on the level of 3×10^{26} years.

Abstract ID. 63 - 3

Title	Large Bolometer Arrays for the Neutrinoless Double Beta Decay Search
Author	Claudia Rusconi (INFN-Sez. Mi-Bicocca)
Co-authors	CUORE collaboration

The CUORE and LUCIFER next-generation 0nbb experiments will use hundreds of bolometers, requiring uniformity among their performances. A thermal model, pointing out the relevant role of the connection between sensor and absorber in defining the quality of the bolometer behavior, will be shown, as well as a new sensor-to-absorber coupling procedure developed to enhance reproducibility in the bolometer performances, used for CUORE-0. Since CUORE-0 is scheduled to be operated in the next months, the application of the model and its comparison with the performance of CUORE-0 may also be discussed.

Abstract ID. 64 - 1

Title	The Search for $0\nu\beta\beta$ with CUORE: First signals from CUORE-0.
Author	Jonathan Ouellet (University of California, Berkeley)
Co-authors	CUORE collaboration

The Cryogenic Underground Observatory for Rare Events (CUORE) is a next generation bolometric detector searching for $0\nu\beta\beta$ and other rare processes operated in LNGS in Italy. CUORE will have an active mass ∼20 times larger and an anticipated background ∼20 times lower than its predecessor CUORICINO, providing a sensitivity to $0\nu\beta\beta$ half-life of $T_{1/2} \sim 1.6 \times 10^{26}$ yr (1σ) after 5 years of run time. Here we present the lessons learned in construction and installation of CUORE-0 – the first of the 20 towers of CUORE – current deployment status, as well as the first indications of detector performance. We will also discuss advanced analysis techniques that will be deployed in the search for $0\nu\beta\beta$ and other rare processes, and prospects for probing the neutrino mass heirarchy in 2012-13.

Abstract ID. 65 - 2

Title	The NEXT Experiment
Author	J. Díaz (IFIC (University of Valencia-CSIC), Valencia, Spain
Co-authors	The NEXT Collaboration

NEXT is a neutrinoless double beta decay detector based on the electroluminiscence phenomenon in a gas Xenon TPC, enriched in the ^{136}Xe isotope at 90%. This detector will be installed in the LSC underground facility at Canfranc (Spain), built by the NEXT collaboration. A preliminary R&D phase carried out with different prototypes is near completion and construction is foreseen in the immediate future. The main advantage of NEXT over a liquid Xenon detector, is the possibility of recording electron tracks in gas Xenon. Also, energy resolution in gas Xenon is better than in LXe, reaching an energy resolution of about 1% at the $Q_{\beta\beta}$ value. Tracks will be recorded by a plane of HAMAMATSU MPPC SiPM photosensors TPB coated, to shift the Xe wavelength (peaked at 175 nm) to the visible spectrum. Energy is read in NEXT with radiopure HAMAMATSU photomultipliers. The sensitivity of NEXT-100 after 5 years would be $T_{1/2}^{\beta\beta0\nu} = 9.13 \times 10^{25}$ years or, in terms of $m_{\beta\beta}$, 78 meV.

Abstract ID. 66 - 3

Title	The Majorana Neutrinoless Double-Beta Decay Experiment
Author	Graham Giovanetti (University of North Carolina at Chapel Hill)
Co-authors	The Majorana Collaboration

The Majorana collaboration is building the Majorana Demonstrator, an array of 40 kg of high-purity germanium detectors located at the 4850 foot level of the Sanford Underground Research Facility in Lead, SD. The array will contain a mix of natural (∼15-20 kg) and >86% enriched ^{76}Ge (∼20-25 kg) detectors. The goals for the Demonstrator include demonstrating a background rate less than 4 counts/tonne/year in the ^{76}Ge neutrinoless double-beta decay region of interest, establishing the feasibility of constructing a tonne-scale germanium based double-beta decay experiment, checking the recent claim of the observation of neutrinoless double-beta decay in ^{76}Ge [H. V. Klapdor-Kleingrothaus and I. V. Krivosheina, Mod. Phys. Lett. A21, 1547 (2006)], and performing a search for WIMPs with masses in the GeV range. This poster will describe some recent research highlights and the construction status of the Demonstrator.

Abstract ID. 67 - 1

Title	Development of low-temperature detectors for a $0\nu\beta\beta$ search
Author	Geon-Bo Kim (Department of Physics and Astronomy, Seoul National University)
Co-authors	AMoRE collaboration

Within the AMoRE project, both scintillation-light and phonon signals produced in $CaMoO_4$ crystals will be used to search for neutrinoless double-beta decay ($0\nu\beta\beta$) of ^{100}Mo with a sensitivity high enough to explore the inverted hierarchy of neutrino masses. The basic concept is the measurement of the temperature rise in a crystal absorber caused by energy deposition of the $0\nu\beta\beta$ products. Because of their excellent energy-resolution, low temperature detectors can greatly increase the sensitivity of $0\nu\beta\beta$ searches. $CaMoO_4$ crystals are used as both the $0\nu\beta\beta$ source and the energy absorber. For the thermometer, a Metallic Magnetic Calorimeter, one of the most competitive LTD readout devices, is employed in the AMoRE detection system.

Abstract ID. 68 - 2

Title	The Hyper-Kamiokande Project: Performance measurement of photodetector
Author	Yasuhiro NISHIMURA (Institute for Cosmic Ray Research)
Co-authors	The Hyper-Kamiokande working group

Hyper-Kamiokande is a water Cherenkov neutrino detector planned for the near future. Its volume is 20 times larger than that of Super-Kamiokande. Several photo-detectors (PD) candidates, such as 20-inch Hybrid Photo-Detector (HPD) with an avalanche diode, are being newly developed. In 2012 it is planned to test a smaller (8-inch) version of this HPD in a 200-ton water Cherenkov detector loaded with Gadolinium. The poster presents a pre-calibration and performance evaluation of 8-inch HPDs before the installation in the tank. A plan for the test of the HPDs inside the 200-ton detector is also presented.

Abstract ID. 69 - 3

Title	Search of the WIMP from the Sun in Super-Kamiokande
Author	Koun Choi (Nagoya university)
Co-authors	Super-Kamiokande collaboration

Super-Kamiokande can detect WIMPs as it can detect the neutrinos which are emitted from the Sun. They are produced by annihilation of a pair of WIMPs accumulated inside the Sun by gravitational force. So far, Super-Kamiokande has done its search for the WIMPs for the Sun using up-going muon, which is sensitive to the search for the WIMPs in several ten GeV $\sim$ few TeV mass range. Taking the advantage of sensitivity of Super-Kamiokande for neutrino signals in few GeV range, the analysis of searching for the WIMPs from the Sun is updated to use contained neutrino events. In Neutrino2012, the first result of the search for the WIMPs for the Sun in Super-Kamiokande using contained events will be presented.

Abstract ID. 70 - 1

Title	Indirect Dark-Matter Detection Through KamL AND
Author	Michinari Sakai (University of Hawaii)
Co-authors	John G. Learned, Jason Kumar

One of the most exciting recent developments in high-energy physics has been the experimental evidence for low-mass dark matter. However, these experimental evidence are in tension with each other. There is now a concerted focus on testing these controversial results with neutrino detectors such as KamLAND. In order to search for neutrinos that originate from dark matter annihilation in the Sun in a liquid scintillator detector such as KamLAND, we must know that the neutrinos themselves point back toward the Sun. At the GeV energy scales of our interest, all the photomultiplier tubes are able to register many photons. Using the relative differences of the photon arrival times at the photomultiplier tubes, neutrino direction, can be reconstructed algorithmically. The great advantage of this new method is that the analysis can be conducted with data already taken at KamLAND, and therefore can be an immediate check for this controversial issue of low mass dark matter.

Abstract ID. 71 - 2

Title	NEWAGE direction-sensitive dark matter search
Author	Kiseki Nakamura (Kyoto University)
Co-authors	NEWAGE collaboration

NEWAGE is a direction-sensitive dark matter search experiment using a gaseous three-dimensional tracking device micro-TPC. After our first underground measurement at Kamioka (PLB686(2010)11), we made several detector updates to improve the sensitivities. One of the main improvements was lowering the energy threshold by decreasing the gas pressure. Energy threshold of a direction-sensitive gaseous detector is limited by the track length. With lower pressure gas, track length will be longer and energy threshold will be lower. We optimized the detector operation with CF4 gas at 76 torr. We will present the overview of NEWAGE as one of the underground experiments, detector performance with low pressure gas, and improved sensitivities to dark matter.

Abstract ID. 72 - 3

Title	Dark Matter Search with Multi-layer NaI Crystals PICO-LON
Author	Ken-Ichi Fushimi (The Univ. of Tokushima)
Co-authors	PICO-LON Collaboration

The PICO-LON system is one of the suitable designs to reduce backgrounds and to enhance the signals. PICO-LON (Planar Inorganic Crystal Observatory for LOw-background Neutr(al)ino) consists of an array of thin NaI(Tl) scintillator plates. The low energy-threshold is quite important performance to search for WIMPs. The measured energy-threshold was 2keV. This is as low as required to search for WIMPs. The good energy resolution is the other important property in the case of inelastic scattering analysis.About 20% energy resolution in Full-Width-Half-Maximum is needed to resolve the signal and the background. The sensitivities for SD DM and SI DM for 10-1000GeV WIMPs are 10^{-6}pb proton equivalent.

Abstract ID. 73 - 1

Title	Determining the dark matter properties with neutrinos in IceCube/DeepCore
Author	C. R. Das (Centro de Fisica Teorica de Particulas)
Co-authors	O. Mena, S. Palomares-Ruiz, S. Pascoli

Cosmological and astrophysical observations provide increasing evidence of the existence of dark matter in our Universe. One of the favored candidates is a weakly interacting massive particle (WIMP). WIMP particles with a mass above a few GeV can be captured by the Sun, accumulate in the core, annihilate, and produce high energy neutrinos either directly or by subsequent decays of Standard Model particles. These neutrinos can be a striking dark matter signature in the IceCube/DeepCore neutrino telescope. We investigate the prospects for indirect dark matter detection in IceCube/DeepCore and its capabilities to determine some dark matter properties, such as mass, cross section and the branching ratios of the various annihilation channels.

Abstract ID. 74 - 2

Title	Search for Dark Matter Captured in the Sun with the IceCube Neutrino Observatory
Authors	M. Danninger, C. Rott and E. Strahler
Co-authors	The IceCube Collaboration

The IceCube Neutrino Observatory can be used to search for neutrinos resulting from dark matter self-annihilation in the center of the Sun, and thus indirectly probe the WIMP-nucleon scattering cross section. In this poster, we present the status of the latest analysis with the 79-string configuration of IceCube, which includes the low energy optimized DeepCore subarray. This extends the sensitivity to 10-20 GeV, a promising region for dark matter candidates. In addition, DeepCore offers the possibility to extend the analysis to the southern sky, effectively doubling the livetime of solar dark matter searches.

Abstract ID. 75 - 3

Title	Search for Dark Matter in Galactic and Extragalactic Halos with the IceCube Neutrino Observatory
Author	Carsten Rott (The Ohio State University)
Co-authors	Martin Bissok and Jan Luenemann for the IceCube Collaboration

Self-annihilating dark matter can lead to excess fluxes of final state products, including neutrinos, from regions of increased dark matter density. The IceCube Neutrino Observatory, a cubic-kilometer neutrino detector at the South Pole, can probe such regions of interest for excess fluxes of neutrinos, thus providing indirect evidence for dark matter. We present here the status of the indirect dark matter searches involving the galactic center, dwarf spheroidal galaxies and galaxy clusters using data taken when the partially completed detector was operated with 40, 59 and 79 strings of optical modules.

Abstract ID. 76 - 1

Title	Search for Secluded Dark Matter using the IceCube Neutrino Observatory
Author	Jonathan Miller (Vrije Universiteit Brussel)
Co-authors	The IceCube Collaboration

Interest has developed in models where dark matter is secluded from the Standard Model via a mediator. Dark matter may be gravitationally captured in the Sun and annihilate into a non-Standard Model mediator, which subsequently decays into Standard Model particles. The result from such a decay, close co-linear muons, can be a unique signal in a neutrino telescope, which can be discriminated from atmospheric neutrinos via the energy deposition topology in the detector. We present the status of secluded dark matter searches with the 79-string IceCube configuration.

Abstract ID. 77 - 2

Title	Directional Dark Matter Search with Nuclear Emulsion
Author	Tatsuhiro Naka (Nagoya university)
Co-authors	T.Asada, T.Katsuragawa, M.Yoshimoto, K.Hakamata, M.Nakamura, O.Sato, T. Nakano, G.De Lellis, C.Sirignano, N.D'Ambrosio and others

We are developing new dark matter detector that is sensitive to direction by using nuclear emulsion. We developed new qdequate nuclear emulsion by ourselves in Nagoya university. This can detect the tracks of 100 nm length. In addition, by expansion technique and new readout system combined with optical microscopy and X-ray microscopy, automatic readout for very short tracks became possible. Now, we are starting to construct the underground facility in Gran Sasso, Itary for test running and background study with prototype detector.

Abstract ID. 78 - 3

Title	Low Energy Neutrino and Dark Matter Physics with Sub-keV Germanium Detectors
Author	Shin-Ted Lin (Academia Sinica)
Co-authors	The TEXONO-CDEX Collaboration

Germanium detectors with sub-keV sensitivities offer a unique window to probe neutrino-nucleus coherent scattering with reactor neutrinos as well as low-mass WIMP dark matter searches. The TEXONO-CDEX Collaboration has been pursuing this program at the Kuo-Sheng Reactor Neutrino Laboratory and the new China Jinping Underground Laboratory. The status of CJPL and the detector R&D projects on energy threshold and background understanding will be presented. Latest results on dark matter analysis will be discussed.

Abstract ID. 79 - 1

Title	Indirect Dark Matter Detection in the Light of Sterile Neutrinos
Author	Arman Esmaili Taklimi (Instituto de Fisica Gleb Wataghin/UNICAMP, Brazil)
Co-authors	Orlando L. G. Peres

The recent global fit of short baseline neutrino oscillation data favors the presence of one (or more) sterile neutrino state which leads to new mass splitting $\Delta m^2 \sim 1\,\mathrm{eV}^2$. We consider the effect of this new states on the evolution of the expected neutrino flux from the annihilation of dark matter particles accumulated at the center of Sun. We show that neutrinos with energy $E_\nu > 100\,\mathrm{GeV}$ undergo resonant active-sterile oscillation which depletes the flux of neutrinos arriving at the Earth. As an example of this effect, we present the oscillation probabilities for the case of monochromatic neutrinos from the direct annihilation of dark matter particles to neutrinos. We present the depletion of neutrino flux and the change in seasonal variation of neutrino flux at the Earth.

Abstract ID. 80 - 2

Title	Search for Solar Axions Produced in the $p+d \rightarrow {}^3\mathrm{He}+\mathrm{A}$ Reaction
Author	Valentina Muratova (St. Petersburg Nuclear Phisics Institute)
Co-authors	A. Derbin, I. Drachnev, A. Kayunov

A search for the axioelectric absorption of 5.5-MeV solar axions produced in the $p + d \rightarrow {}^3\mathrm{He} + \gamma$ (5.5 MeV) reaction was performed with BGO detectors placed inside a low-background setup. A model independent limit on axion-photon and axion-nucleon couplings was obtained: $|g_{Ae} \times g_{AN}| \leq 3.2 \times 10^{-9} (m_A = 0)$. Constraints on the axion-electron coupling constant were obtained for axions with masses in the $(0.1 - 1.0)$ MeV range: $g_{Ae} \leq (1.8 - 9.0) \times 10^{-7}$. The solar positron flux from $A \rightarrow e^- + e^+$ decay was determined for axions with masses $m_A > 2m_e$. Using the existing experimental data on the interplanetary positron flux, a new constraint on the axion-electron coupling constant for axions with masses in the $(1.2 - 5.4)$ MeV range was obtained: $g_{Ae} \leq (1 - 5) \times 10^{-17}$.

Abstract ID. 81 - 3

Title	Search for 5.5 MeV solar axions with Borexino detector
Author	Alexander Derbin (Petersburg Nuclear Physics Institute)
Co-authors	The Borexino collaboration

A search for 5.5-MeV solar axions emitted in the $p+d \rightarrow {}^3\mathrm{He}+\mathrm{A}$ (5.5 MeV) reaction have been performed with Borexino detector. The Compton conversion of axion to a photon $A + e \rightarrow e + \gamma$, axioelectric effect $A + e + Z \rightarrow e + Z$, decay of axion in two photons $A \rightarrow 2\gamma$ and Primakoff conversion on nuclei $A + Z \rightarrow \gamma + Z$ are considered. Model independent limits on axion-electron g_{Ae}, axion-photon $g_{A\gamma}$ and isivector axion-nucleon g_{3AN} couplings are obtained.

Abstract ID. 82 - 1

Title	An Optical Transition Radiation Monitor for the T2K Proton Beam Line
Author	Sampa Bhadra (York University)
Co-authors	The T2K collaboration

The neutrinos studied in the T2K experiment come from the decay of hadrons produced by a proton beam incident on a graphite target. An accuracy of 1 mm on the beam position is required to constrain the neutrino energy spectrum, affecting the extraction of oscillation parameters. The Optical Transition Radiation (OTR) monitor accurately measures the 2D profile of the proton beam at the target by imaging transition radiation produced by the beam as it traverses a metallic foil. This poster will present details of the design, installation, calibration and performance of the T2K OTR monitor.

Abstract ID. 83 - 2

Title	Measurement of Pion and Kaon production cross sections with NA61/SHINE for T2K
Author	Sebastien Murphy (University of Geneva)
Co-authors	Sebastien Murphy

T2K, being a second generation long baseline accelerator neutrino oscillation experiment, requires a very good knowledge of neutrino fluxes. Previous experiments often suffered from a poor knowledge of the secondary hadron production at the target. These hadron yields were generally provided by Monte Carlo generators tuned to sparse available data, resulting in systematic uncertainties which are large and difficult to evaluate. For the first time, preliminary proton spectra will also be presented. Those measurements have significantly contributed to reduce the uncertainty on the first T2K ν_e appearance result which constrained the value of last unknown neutrino mixing angle, θ_{13}, to be non-zero at the 90% confidence level. The measurements have also contributed to the first T2K ν_μ disappearance result. The NA61/SHINE detector and its particle identification capabilities are presented. The analysis techniques and the impact of the charged pion measurements on the T2K systematic uncertainties are also discussed.

Abstract ID. 84 - 3

Title	Hadron Production Measurements with the T2K Replica Target in NA61/SHINE for the T2K Neutrino Flux Prediction
Author	Alexis Haesler (University of Geneva)
Co-authors	The NA61/SHINE collaboration

We present analysis method, pilot results and prospects of the measurements of hadron production with the T2K replica target in the NA61/SHINE experiment at CERN SPS. Data on thin target (4% interaction length) allow to constrain $\sim$ 60% of the neutrino flux in the T2K experiment, the other 40% being due to re-interactions in the target material and in surrounding support structure, thus model dependent. Hadron production measurements on the replica target should constrain directly up to 90% of the flux. These measurements are the ultimate goal to make precise neutrino flux predictions. In addition the comparison of thin target and replica target provide information on reinteractions of particles in the target and constrain the corresponding hadron interaction models.

Abstract ID. 85 - 1

Title	Performance of the Muon Monitor in the T2K Experiment
Author	Kento Suzuki (Kyoto University)
Co-authors	T2K collaboration

T2K (Tokai-To-Kamioka) is a long baseline neutrino oscillation experiment which uses the 30GeV proton beam produced at Japan Proton Accelerator Research Complex (J-PARC) The direction of the neutrino beam generated at the J-PARC to the far detector, Super-K, is intentionally shifted by 2.5 degrees in order to maximize the sensitivity to the neutrino oscillation and it is necessary to control the beam direction within 1 mrad. The T2K muon monitor is located 118 m downstream from the carbon target and measures the direction and intensity of muons which are generated with neutrinos from parent pion decays. We will report about the performance of the T2K muon monitor and how important this monitor is for our experiment.

Abstract ID. 86 - 2

Title	Improvement and recent status of the beam monitoring with T2K neutrino beam monitor INGRID
Author	Tatsuya Kikawa (Kyoto University)
Co-authors	C.Bronner, O.Ferreira, M.Gonin, A.K.Ichikawa, A.Minamino, A.Murakami, T.Nakaya, B.Quilain, K.Suzuki, K.Yamamoto, for the T2K collaboration

T2K is a long baseline neutrino oscillation experiment aiming at a precise measurement of ν_μ disappearance and a search for ν_e appearance. On-axis neutrino detector, INGRID monitors the neutrino beam direction and intensity to ensure the T2K physics result. However, it is susceptible to the event pileup and dark count of the photo detectors in the current analysis. So the analysis is improved so that these effects become small. We will present the improvement of the analysis and recent status of the neutrino beam monitoring with INGRID.

Abstract ID. 87 - 3

Title	Measurement of the flux averaged Inclusive Charged Current cross-section
Author	Melody Ravonel Salzgeber ((University of Geneva)
Co-authors	The T2K Collaboration

The T2K collaboration presents its first cross-section measurement using the near detector (ND280) data at JPARC (Tokai). Events are inclusively selected by observation of a muon. The measurement is given as a flux-averaged differential cross-section in the 2-dimensional plane of muon momentum and angle. The flux is given by the MC and tuned to data from the NA61 experiment. Data were taken in 2010 (runI) and 2011 (run II), corresponding to a total of 10.911×10^{19} protons on target. A total of 4486 events inclusive charged current interaction candidates were selected in the first fine-grained scintillator detector of ND280 (FGD1).

Abstract ID. 88 - 1

Title	Inclusive spectra of K0S mesons in p+C interactions at 31 GeV/c from NA61/SHINE at the CERN SPS
Author	Tomasz Jan Palczewski (National Centre for Nuclear Research)
Co-authors	The NA61 Collaboration

Preliminary K^0_S results from the NA61/SHINE experiment obtained on p+C @ 31GeV/c 2007 data are shown. These results are needed for the high precision determination of background contamination in the neutrino beam of T2K experiment. In particular, knowledge of neutral kaon production is required for the accurate calculation of the ν_e and $\overline{\nu}_e$ fluxes from $K^0_L \rightarrow \pi$ e ν_e decays. Performance of the NA61 detector with respect to the analysis of K^0_S production via decay to two charged pions is discussed. Inclusive production cross-sections for K^0_S as a function of p and θ with statistical and systematic errors are shown.

Abstract ID. 89 - 2

Title	Methods to Determine Neutrino Flux at Low Energies: Investigation of the Low nu Method
Author	Arie Bodek (University of Rochester)
Co-authors	U. Sarica, D. Naples and L. Ren

We investigate the low-ν method (developed by the CCFR/NUTEV collaborations) to determine the neutrino flux in a wide band neutrino beam at very low energies, a region of interest to neutrino oscillations experiments. We investigate the application of the method to determine the neutrino flux for ν_μ, $\bar{\nu}_\mu$ energies as low as 0.7 GeV where the cross sections are dominated by quasielastic scattering and $\Delta(1232)$ resonance production. We find that the method can be extended to low energies by using ν_{cut} values of 0.25 and 0.50 GeV. (For additional information see http://arxiv.org/abs/1201.3025).

Abstract ID. 90 - 3

Title	First Muon-Neutrino Disappearance Study with the T2K Off-Axis Beam
Author	M. Otani (Kyoto University)
Co-authors	T2K collaboration

The question of whether one of the neutrino mixing angles, θ_{23}, is exactly 45 degrees or not is one of the main interests of neutrino physics. T2K is a long baseline neutrino oscillation experiment aimed to measure θ_{23} via muon neutrino disappearance with an accuracy of 3 degrees, whereas the current uncertainty of θ_{23} is 7 degrees. T2K collected first data until March 2011 and performed the first analysis of neutrino data. This poster presents the far detector analysis, the oscillation analysis method and result, and T2K's sensitivity with higher statistics.

Abstract ID. 91 - 1

Title	Measurement of the ν_e Component of T2K's ν_μ Beam in the ND280 P0D
Author	Ian Taylor (Stony Brook University)
Co-authors	Ian Taylor & Jay Hyun Jo for the T2K Collaboration

We present the first official results from T2K's π^0 detector (P0D), part of the off-axis near detector suite, ND280. The analysis measured the production rate of high energy ν_e, intrinsic to the T2K beam. This rate was found to agree with the rate predicted for T2K's 2011 ν_e appearance measurement (arXiv:1106.2822), within statistical and systematic errors, and will be used to constrain the intrinsic ν_e background for T2K's next ν_e oscillation result.

Abstract ID. 92 - 2

Title	Sterile neutrino search at T2K using NC nuclear de-excitation gamma-rays
Author	Koh Ueno (ICRR, Univ. of Tokyo)
Co-authors	The T2K collaboration

When a sub-GeV neutrino interacts with ^{16}O in a water Cherenkov detector via the neutral current (NC) channel, the only activity is nuclear de-excitation gamma-rays since the lepton remains neutral after the interaction. We have performed a low energy (4 - 30 MeV) event search in the T2K data. The result of the measurement can be applied to a sterile neutrino search, which searches the depletion of the total neutrino flux at the far detector via the NC channel. Future sensitivity of this sterile neutrino search is also discussed.

Abstract ID. 93 - 3

Title	Outer Detector Events at T2K
Author	Taritree Wongjirad (Duke University)
Co-authors	The T2K collaboration

In T2K, the far detector, Super-Kamiokande (Super-K), is divided into two segments: a cylindrical inner volume, the Inner Detector (ID), nested inside a cylindrical outer volume, the Outer Detector (OD). Typically, the OD acts as a cosmic ray veto for the ID. However, in T2K, events that involve light in the OD can be kept for use in neutrino analyses by accepting only those events that are coincident with the expected arrival of beam neutrinos at Super-K. This selection suppresses background contamination to the few percent and roughly doubles the number of T2K neutrino events observed at Super-K. This poster will describe the OD events, their selection, and characteristics.

Abstract ID. 94 - 1

Title	T2K ν_e appearance analysis using energy spectrum
Author	Shoei Nakayama (Kamioka Observatory, ICRR, University of Tokyo)
Co-authors	The T2K Collaboration

As already reported in 2011, the T2K long baseline neutrino experiment observed indications of $\nu_\mu \rightarrow \nu_e$ oscillations driven by non-zero θ_{13} in data accumulated with 1.43×10^{20} protons on target. After recovery work from damages due to the Japan earthquake in March 2011, we have recommenced an accumulation of neutrino beam data for oscillation analyses in March 2012. We will present results of an improved ν_e appearance analysis using data collected both before and after the earthquake. This analysis uses, in addition to the number of observed events after all selection criteria, an extended maximum likelihood fit to the reconstructed neutrino energy spectrum to derive a better sensitivity on θ_{13}. Details of the analysis including updated estimation of systematic errors will be presented.

Abstract ID. 95 - 2

Title	Recent Result of numu disappearance analysis in T2K experiment
Author	Jun Kameda (Institute for Cosmic Ray Research, University of Tokyo)
Co-authors	Akihiro Minamino and T2K collaboration

We present a result of muon neutrino disappearance in T2K experiment based on updated data set (T2K RUN1,2, and 3) and update systematic error evaluation. We employ an extended maximum likelihood method using both the the neutrino energy spectrumand the number of events induced by muon neutrino interactions. We also plan to present the details of the analysis method and systematic errors.

Abstract ID. 96 - 3

Title	Development of Small Water Cherenkov Detector “Mizuche“ at T2K Near Detector Hall
Author	Shota Takahashi (Kyoto University)
Co-authors	A. Murakami, K. Huang, A. K. Ichikawa, K. Sakashita, T. Kobayashi, T. Nakaya, M. Ikeda, A. Minamino

”Mizuche” is the newly-built water Cherenkov detector in the near detector area (ND) of the T2K experiment. Since T2K uses Super-Kamiokande(SK), the world’s largest water-Cherenkov detector, as a far detector, we decided to build the same type of detector to improve the T2K result to achieve two goals: (1) precise number measurement of ν interaction on a water target in the ND area, and (2) reduce systematic errors which come from ν cross-section uncertainties and detector efficiency differences when extrapolating to deduce the number of ν expected at SK. Mizuche expects 304 events per day in its 0.5 ton fiducial volume with full intensity (750kW) beam. It is much much smaller than SK, however, reducing the size makes detection feasible in T2K’s high intensity neutrino beam. Its data taking started in Mar. 2012. This poster will present details of the design and performance of the Mizuche detector.

Abstract ID. 97 - 1

Title	GLADE: a Global Liquid Argon Detector Experiment
Author	Justin Evans (University College London)
Co-authors	Jennifer Thomas

The field of neutrino physics is focusing on answering the questions of the neutrino mass hierarchy and CP violation. Recent measurements show that θ_{13} is large, meaning that the answer to these questions lies just beyond the limits of current sensitivities. GLADE will be a 5 kt liquid argon TPC in the NuMI beam, searching for electron neutrino appearance. With an electron neutrino identification efficiency three times better than NOνA technology, GLADE will significantly improve the physics capability of the beam. Data taking will begin within five years. With a large θ_{13}, a combination of GLADE and NOνA will be able to resolve the mass hierarchy and address the question of CP violation. GLADE will also act as an invaluable prototype of the massive liquid argon detectors which will be put in future megawatt beams.

Abstract ID. 98 - 2

Title	Status of the NOvA Experiment
Author	Nathan Mayer (Tufts University)
Co-authors	The NOvA collaboration

The NOvA experiment is a next generation long-baseline neutrino experiment. When completed the NOvA detectors will be positioned 14 milliradians off the NuMI beam axis and will measure θ_{13} by measuring the appearance electron neutrinos in the far detector. The NOvA Near Detector On the Surface (NDOS) is a NOvA prototype detector that has been collecting data since October 2010, this data includes cosmic ray data along with Booster neutrino and NuMI beam data. This poster will discuss the current status of the NOvA experiment including far detector assembly plans, far detector site status, and the status of NDOS data analysis.

Abstract ID. 99 - 3

Title	Neutrino Physics with the NOνA Experiment
Author	Raphael Schroeter (Harvard University)
Co-authors	NOνA collaboration

The NOνA experiment is a next generation long-baseline, accelerator-based neutrino oscillation experiment, currently under construction at Fermilab and northern Minnesota. NOνA will improve the existing constraints on electron neutrino appearance by more than an order of magnitude by comparing electron neutrino rates observed by two totally active liquid scintillator detectors, located 14 mrad off the NuMI neutrino beam axis. Running a NuMI facility upgraded to 700 kW of beam power in neutrino and anti-neutrino modes, on an 810 km long baseline, NOνA can establish the neutrino mass hierarchy and will pioneer searches for CP violation in the leptonic sector. We present an overview of the NOνA experiment and its expected neutrino physics sensitivities.

Abstract ID. 100 - 1

Title	Search for Effects of Exotic Models in MINOS
Author	Joao Coelho (Tufts University)
Co-authors	MINOS Collaboration

MINOS is a long-baseline oscillation experiment that observes neutrinos from the NuMI beamline. MINOS has performed precision measurements of oscillation parameters in the atmospheric sector and confirmed neutrino oscillations as the best description of neutrino flavor transitions. However, alternative models may introduce deviations from the standard oscillation probabilities. We will present a search for effects of exotic models combined with oscillations in MINOS. These models explore the possibilities of neutrino decoherence, neutrino decay and non-standard interactions.

Abstract ID. 101 - 2

Title	MINOS+: Running the MINOS Detectors with the Medium Energy NuMI beam
Author	Benton Pahlka (Fermi National Accelerator Laboratory)
Co-authors	Justin Evans

MINOS+ is a neutrino oscillation experiment designed to perform precision tests of the standard 3 x 3 neutrino mixing model, probe sterile neutrino physics, measure neutrino time-of-flight, and test other neutrino models. The experiment will run in the medium-energy setting of the NuMI beam, projected to deliver about 18×10^{20} POT during the first three years of operation in the 4-10 GeV energy range. This experiment offers unprecedented and unique opportunities to explore physics beyond the three-neutrino mixing model. We describe the physics reach of MINOS+ and present results of sensitivity studies.

Abstract ID. 102 - 3

Title	Measuring Neutrino Oscillations with the MINOS Experiment
Author	Alexander Radovic (MINOS)
Co-authors	Son Cao

The observation of neutrino oscillation provided the first evidence for physics beyond the standard model. MINOS has been one of the foremost experiments in the field. Pioneering the two-detector technique, the long baseline oscillation experiment has led the world in its oscillation measurements, not only making the most precise measure of the largest mass splitting, but also the first direct measurement of the antineutrino oscillation parameters. As we draw close to the end of the current incarnation of the MINOS experiment, this poster provides a definitive summary of the contribution MINOS has made to the world's knowledge of θ_{23} and $\Delta|m_{atm}|^2$ through the observation of muon neutrino and antineutrino disappearance.

Abstract ID. 103 - 1

Title	Updated results on sterile neutrinos at MINOS
Author	Alexandre Sousa (Harvard University)
Co-authors	Alena Gavrilenko, Mark Mathis

The phenomenon of neutrino oscillations is the first evidence for physics beyond the standard model. Some experiments have shown hints of oscillations involving a fourth, sterile neutrino flavour. In long baseline experiments such as MINOS, oscillations involving sterile neutrinos could cause a deficit in the neutral current event rate. In this poster we describe measurements of the neutral current energy spectrum in two detectors separated by 735km and interpret the results in a neutrino mixing framework with 3 active + 1 sterile neutrino.

Abstract ID. 104 - 2

Title	Combined Measurement of the Beam and Atmospheric $\bar{\nu}$ Oscillation Parameters from the MINOS Experiment
Author	Luke A. Corwin (Indiana Univerisity)
Co-authors	Andy Blake, Michelle Mesquita de Medeiros, Rashid Mehdiyev, Son Cao, Xinjie Qiu, Alec Habig, and Stuart Mufson

The Main Injector Neutrino Oscillation Search (MINOS) experiment at Fermilab has measured the oscillation parameters for $\overline{\nu}_\mu$ using the Main Injector beam and $\overline{\nu}_\mu$ created by cosmic ray interactions in the atmosphere. Our data consists of a total exposure of at least 2.95×10^{20} protons on target from the beam and 2553 live days (37.9 kt-yrs.) of exposure to atmospheric neutrinos. We present the current status of a joint maximum likelihood fit to the two sets of data, which yields improved confidence limits on the $\bar{\nu}$ oscillation parameters.

Abstract ID. 105 - 3

Title	Possibilities for underground physics experiments in the Pyhäsalmi mine
Author	Timo Enqvist (University of Oulu)
Co-authors	The LAGUNA-LENA working group

The Pyhäsalmi mine provides several advantages for hosting underground physics experiments. It has been considered a possible site for a large next-generation neutrino experiment (LAGUNA). Detectors of the 50 kton scale, based for example on liquid scintillator or liquid argon techniques, would be placed at the depth of 4000 mwe. The reactor neutrino background is low, allowing to study geoneutrinos and to search for diffuse supernova neutrino background. The nearly bi-magic distance of 2300 km from CERN makes it possible to solve the neutrino mass hierarchy and to study the CP-violation with neutrino beams.

Abstract ID. 106 - 1

Title	The International Design Study for the Neutrino Factory
Author	Kenneth Long (Imperial College London)
Co-authors	The IDS-NF collaboration

The International Design Study for the Neutrino Factory (the IDS-NF) has been established to deliver a Reference Design Report (RDR) for the facility by 2013. The Interim Design Report, which has recently been completed, presents two options for the facility. The first, optimized for discovery reach at small θ_{13}, calls for two distant detectors. The second, optimized for sensitivity at large θ_{13}, requires a single detector at a distance of 2000 km and a stored-muon energy of 10 GeV. The facility will also include a suite of near detectors. The coneptual design and performance of the facility will be presented together with a discussion of the motivation for precise measurements of the neutrino-mixing parameters.

Abstract ID. 107 - 2

Title	The EUROnu CERN-to-Frejus neutrino Super Beam
Author	Marcos Dracos (IPHC-IN2P3/CNRS)
Co-authors	E. Baussan, N. Vassilopoulos

In the framework of the European Design Study EUROnu, a new design for the CERN to Frejus neutrino Super Beam is under development. This neutrino beam allows to significantly improve its discovery potential of CP violation in the leptonic sector by using a multi-MW proton beam of 4.5 GeV/c, a baseline of 130 km and the future Water Cherenkov detector MEMPHYS (440 kton fiducial mass). The main challenge of this project lies with the design of a multi-MW target for the proton beam. The horn and the decay tunnel parameters have been optimized with a novel procedure based on a scan of a multi-dimensional parameter space in order to maximize any potential discovery. The physics potential from the combined experiment of the Super Beam and MEMPHYS detector is also shown.

Abstract ID. 108 - 3

Title	LENA as a far detector for beam neutrinos
Author	Kai Loo (University of Jyvaskyla)
Co-authors	The LAGUNA-LENA Working Group

The proposed large liquid scintillation detector LENA (Low Energy Neutrino Astronomy) will offer an optimal solution to register low energy neutrinos to probe the Sun, supernovae, and the Earth. In addition to that rich scientific program the advancements in the acquisition and in the processing of signals from fast photo-sensors make it possible to consider neutrino tracking with LENA and use it also as a secondary far detector in the long baseline neutrino oscillation studies. This poster presents the status of the ongoing work in the context of LAGUNA-LBNO Design Study.

Abstract ID. 109 - 1

Title	Neutrino oscillometry with LENA
Author	Wladyslaw Henryk Trzaska (University of Jyvaskyla)
Co-authors	The LAGUNA-LENA working group

The proposed LAGUNA-LENA detector with the fiducial volume of 50 kton of liquid scintillator enclosed in a 100 m long tank, in addition of being an ideal detector for a very wide range of astroparticle topics, would also enable a new way to study neutrino oscillations. By providing a very low energy threshold and high detection efficiency LENA will be sensitive also to sub-MeV neutrinos. Our calculations indicate that with a detector like LENA and a suitable, monoenergetic source of neutrinos these subtle effects would be measureable. The presence of the proposed sterile neutrinos would add to the smooth slope, governed by the θ_{13} mixing parameter, an additional high frequency component with a period of about 1 m. Within the length of LENA many of such fluctuations would occur providing adequate data for a fitting procedure to revile the existence of the sterile neutrino pattern and even distinguishing between the (3+1) and the (3+2) scenario.

Abstract ID. 110 - 2

Title	Status of MICE
Author	Linda Coney (University of California Riverside)
Co-authors	The MICE Collaboration

Ionization Cooling is the only practical solution to preparing high brilliance muon beams for a neutrino factory or muon collider. The muon ionization cooling experiment (MICE) is under development at the Rutherford Appleton Laboratory (UK) by an international collaboration. The muon beam line has been commissioned and, for the first time, measurements of beam emittance with particle physics detectors have been performed. The remaining apparatus is currently under construction. First results with a liquid-hydrogen absorber will be produced in 2013; a couple of years later a full cell of a representative ionization cooling channel, including RF re-acceleration, will be in operation. The design offers opportunities to observe cooling with various absorbers and several optics configurations. Results will be compared with detailed simulations of cooling channel performance to ensure full understanding of the cooling process.

Abstract ID. 111 - 3

Title	Sensitivity to Sterile Neutrinos from Muon Decay at νSTORM
Author	C.D. Tunnell (University of Oxford)
Co-authors	νSTORM collaboration

A facility to study sterile neutrinos and measure ν_μ/ν_e cross sections is proposed. As a figure-of-merit, there is 10σ sensitivity to the LSND anomaly. Neutrinos from STORed Muons (NuSTORM) uses a race-track muon decay ring to direct neutrinos from 3.8 GeV/c muon decay at detectors placed at 20 m and 800 m. The near detector will be used to measure ν_μ/ν_e cross sections. Accelerator instrumentation will be able to measure the neutrino flux to better than 1%. The far detector will be a 1 kt sampling iron calorimeter magnetized using a superconducting transmission line for a > 2 T toroidal field throughout the plates. There is no new technology in either the accelerator or detectors. In addition to disappearance measurements, measurements are possible searching for $\nu_e \rightarrow \nu_\mu$ wrong-sign muon appearance. Assuming CPT invariance, this is the same channel as the LSND anomaly and would provide ~ 200 signal and ~ 10 background for the current favored (3+1) best fit value. The sensitivity analysis will be presented.

Abstract ID. 112 - 1

Title	Neutrinos from STORed Muons, νSTORM
Author	Alan D Bross (Fermi National Accelerator Laboratory)
Co-authors	νSTORM collaboration

The results of LSND and MiniBooNE, along with the recent papers on a possible reactor neutrino flux anomaly, give tantalizing hints of new physics. Models beyond the νSM have been developed to explain these results and involve one or more additional neutrinos that are non-interacting or "sterile." Neutrino beams produced from the decay of muons in a racetrack-like decay ring provide a powerful way to study this potential new physics. In this poster, I will describe the facility, νSTORM, and an appropriate far detector for neutrino oscillation searches at short baseline. I will explain how the facility can be used for ν oscillations searches and to make neutrino interaction cross section measurements with a precision impossible to reach with a conventional neutrino beam, which will be important to the next generation of long-baseline neutrino oscillation experiments. The near-detector hall of the facility can also serve as a neutrino detector test facility given the unprecedented accuracy to which the neutrino beam from the decay ring can be characterized.

Abstract ID. 113 - 2

Title	Short baseline muon neutrino disappearance experimental results
Author	Kendall Mahn (TRIUMF)
Co-authors	SciBooNE, MiniBooNE collaborations

Neutrino mixing is consistent with three generations of neutrinos and a unitary mixing matrix. However, there is tension between the LSND experiments result of $\overline{\nu}_e$ appearance at short baseline and the lack of such observation with the analogous result of the MiniBooNE experiment with neutrinos, indicating a possible third Δm^2 around $1eV^2$ due to more than three neutrino generations or other exotic physics. A complementary way to access the same physics as ν_e appearance is ν_μ disappearance. This poster describes the improvements to the MiniBooNE-only ν_μ disappearance search with the addition of data from the SciBooNE experiment, which constrains flux and cross section uncertainties.

Abstract ID. 114 - 3

Title	NESSIE: an experimental search of sterile neutrinos with the CERN-SPS beam
Authors	Umut Kose (INFN-Padova)
Co-authors	NESSiE Collaboration

The experimental search of sterile neutrinos is based on two strictly identical LAr-TPC followed by magnetized spectrometers, NESSiE, observing the ν_μ events in the Far and Near positions at 1600 and 300 m from the proton target, respectively. Spectrometers will exploit a classical dipole magnetic field with iron slabs and a new concept air-magnet to perform charge identification and muon momentum measurements from low energy (<1 GeV) in a wide energy range over a large transverse area. In the two positions, the radial and energy spectra of the ν-beam are practically identical. In absence of oscillations, all cross sections and experimental biases cancel out and the two experimentally observed event distributions must be identical. Any difference of the event distributions at the locations of the two detectors might be attributed to the possible existence of ν-oscillations, presumably due to additional sterile neutrinos.

Abstract ID. 115 - 1

Title	Measurement of NC1π^0 production using the ND280 P0D
Author	Karin Gilje (Stony Brook University)
Co-authors	Glenn Lopez and the T2K Collaboration

We present a measurement of the neutral current single π^0 production (NC1π^0) cross section using T2K data corresponding to 8.55×10^{19} protons on target. We measure the ratio of the NC1π^0 cross section to the NEUT prediction divided by the ratio of the charged current inclusive measurement in the T2K Tracker. We apply a selection criteria to the reconstructed events to enhance the invariant mass distribution which is fit with an extended likelihood fit to extract the number of signal events. Future analyses can use the rates of the filled and emptied π^0 detector to extract the rate of NC1π^0 production in the JPARC beam on water. This rate can then be extrapolated to Super-Kamiokande to increase the significance of the oscillation result.

Abstract ID. 116 - 2

Title	Pion Final State Interactions in NEUT
Author	Patrick de Perio (University of Toronto)
Co-authors	

Pion final state interactions (FSI), hadronic interactions experienced by pions as they traverse the nuclear medium after being produced from a neutrino-nucleon interaction, affect the interpretation of measurements using neutrino-nucleus interactions. FSI affect the distributions of particles escaping the nucleus and observed by the detector, distorting the topology and kinematics of the nucleon-level interaction. The modelling of FSI is one of the most challenging and important aspects of neutrino event generators like NEUT, which is currently used in the T2K and SK experiments. This poster describes the NEUT FSI microscopic cascade model, including a constraint using pion-nuclei data propagated to the T2K oscillation analyses, and its use for secondary interactions in the SK detector simulation.

Abstract ID. 117 - 3

Title	Measurement of the ν_e flux of T2K's beam in the tracker of ND280
Author	Javier Caravaca (Institut de Fisica d'Altes Energies (IFAE))
Co-authors	T2K collaboration

The main physics goal of the T2K experiment is the measurement of PMNS mixing angle θ_{13} through the observation of ν_e appearance in a ν_μ neutrino beam. The main background to this measurement is the intrinsic ν_e beam component that has to be measured before the oscillation at the T2K Near Detector (ND280). We select neutrino interactions in the Fine Grained Detector (FGD) and distinguish electrons from muons by combining the tracking and PID capabilities of 3 Time Projection Chambers (TPC) and an Electromagnetic Calorimeter (ECAL). Thanks to the combination of these detectors, we are able to reject more than 99% of the muons produced by the dominant ν_μ interactions. The result of this analysis provides confidence in the understanding of the intrinsic ν_e beam component of the T2K beam.

Abstract ID. 118 - 1

Title	Measurement of CC inclusive cross-section on Iron in a few GeV neutrino beam at the T2K
Author	Akira Murakami (Kyoto university)
Co-authors	A.K.Ichikawa, C.Bronner, T.Kikawa, M.Gonin, A.Minamino, T.Nakaya, K.Suzuki, K.Yamamoto, M.Yokoyama, the T2K collaboration

In T2K, INGRID is on-axis neutrino beam monitor which composes with 14 identical neutrino detecting modules. The method of the cross-section measurement by INGRID is to take advantage of the difference of flux at each modules. The energy spectrum of the neutrino flux at each modules is expected to be different only in the 1 GeV to 3GeV range from the simulation. By the toy MC with statistical error, the uncertainty of the cross-section in this region is found to become about 4%.

Abstract ID. 119 - 2

Title	Constraining neutrino interaction parameters in T2K using MiniBooNE data
Author	Peter Sinclair (Imperial College London)
Co-authors	The T2K collaboration

Within the next few years, the measurements of the T2K experiment will become systematics-limited. It is therefore necessary to accurately determine the parameters and uncertainties associated with neutrino interaction cross sections. I report on a framework that has been developed to obtain the central values and uncertainties of cross-section parameters using external data, and discuss the issues involved in simultaneously fitting multiple datasets. I also present preliminary parameter extractions from the MiniBooNE CCQE data.

Abstract ID. 120 - 3

Title	Measurement of the Muon Neutrino Spectrum at the T2K Near Detector
Author	Brian Kirby (University of British Columbia)
Co-authors	The T2K Collaboration

We present the first measurement of the muon neutrino spectrum taken at the T2K near detector. This spectrum constrains the flux and cross section uncertainties in the most recent T2K oscillation analysis. A selection of charged current events is separated into a charged current quasi elastic (CCQE) enhanced sample and a CC non-QE sample. The muon spectrum for both samples are then fit to extract flux and cross section parameters. The event selection, detector uncertainties, and final measurement results will be shown.

Abstract ID. 121 - 1

Title	Duet experiment:Measurement of pion single charge exchange scattering in scintillator
Author	Motoyasu Ikeda (Kyoto University)
Co-authors	The Duet collatboration

A result of the precise measurement for pion charge exchange cross-section in scintillation fibers is presented. In 2010 and 2011, we performed measurements using newly developed detectors at TRIUMF. The momentum range of pions is selected between 100 MeV to 400 MeV which is a important energy region for T2K experiment. In our measurement, the absorption and the charge-exchange can be separated by the γ ray detectors surrounding the scintillation fiber target. Then, I will focus on the measurement of charge-exchange cross-section.

Abstract ID. 122 - 2

Title	Duet experiment: Measurement of final state interaction of pion with finely segmented scintillating fibers
Author	Kei Ieki (Kyoto University)
Co-authors	The Duet collaboration

When a neutrino interacts with a nucleus, the final state hadrons, such as pions from CC1π interactions ($\nu + N \rightarrow l + N + \pi$), will possibly re-interact before it escapes from the nucleus. In T2K, the systematic error caused by the final state pion interaction is large, due to large cross section errors ($\sim$25%) in past experiments, which we use in our predictions. In the Duet experiment, we measured the pion absorption/CX cross section with pion beam momentum range of 150 $\sim$ 350 MeV/c, using finely segmented scintillating fiber detector. The result of the cross section measurement will be presented.

Abstract ID. 123 - 3

Title	Duet experiment: Overview and Detector Performance
Author	Yasutaka Kanazawa (University of Tokyo)
Co-authors	The Duet collaboration

In the T2K experiment, charged current quasielastic interactions (CCQE, $\nu + N \rightarrow l + N$) are used for the neutrino energy reconstruction. However, CC pion production ($\nu + N \rightarrow l + N + \pi$) may not be distinguished from CCQE due to re-interaction of the final state hadrons inside the nucleus. The uncertainty of pion interaction cross sections with the nucleus is one of the major systematic uncertainties in precision neutrino oscillation measurements. The goal of the Duet experiment is to measure the cross sections of pion absorption and charge exchange (CX) for pion momentum between 150-350 MeV/c. The experiment was carried out at the TRIUMF M11 secondary beam line in 2010 and 2011. In this poster, the overview of the Duet experiment and the performance of the detectors will be presented.

Abstract ID. 124 - 1

Title	Inclusive neutrino cross section measurements at MINERvA
Author	Jorge G. Morfin (Fermi National Accelerator Laboratory)
Co-authors	The MINERvA Collaboration

MINERvA is a few-GeV neutrino scattering experiment that has been taking data in the high intensity NuMI beam line at Fermilab since November 2009. The experiment will provide important inputs, both in support of neutrino oscillation searches and as a pure weak probe of the nuclear medium. For this, MINERvA employs a fine-grained detector, with an eight ton active target region composed of plastic scintillator and a suite of nuclear targets composed of helium, carbon, iron, lead and water placed upstream of the active region. In this poster, we present preliminary results for nuclear effects on charged current events in iron, lead and plastic.

Abstract ID. 125 - 2

Title	Meson Exchange Current effects in the neutrino oscillation experiments
Author	Jan Sobczyk (FermiLab)
Co-authors	Jorge. G. Morfin (FermiLab)

We discuss Meson Exchange Current (MEC) contribution implemented in the NuWro Monte Carlo event generator with Final State Interactions included. We review the potential impact of MEC on the analysis of neutrino oscillation experiments by examining the influence of MEC on the quality of energy reconstruction for quasi elastic scattering and commenting on the need to include MEC in calculations of background to ν_e appearance.

Abstract ID. 126 - 3

Title	Study of hadron interactions in OPERA-like bricks
Author	Hiroshi Shibuya (Toho University)
Co-authors	H. Ishida, T. Fukuda, T. Matsuo et al. OPERA collaboration

The OPERA experiment in the underground Gran Sasso Laboratory (LNGS) was designed to perform the first detection of neutrino oscillations in direct appearance mode in the $\nu_\mu \rightarrow \nu_\tau$ channel, the ν_τ signature being the identification of the τ-lepton produced in its charged current (CC) interaction. One of the main sources of background in the $\tau \rightarrow h$ and $\tau \rightarrow hhh$ decay channels comes from inelastic interactions of hadrons produced in neutral current (NC) interactions, or in CC interactions where the primary lepton is not identified and in which no nuclear fragments can be associated. This has been evaluated with a FLUKA based MC code and cross-checked with our measurements of hadron interactions in OPERA-like ECC bricks exposed to hadron beams. The poster will illustrate this study and its main results.

Abstract ID. 127 - 1

Title	Unified microscopic approach to the lepton-nucleus scattering at intermediate energy transfers
Author	Jakub Żmuda (Institute of Theoretical Physics, University of Wroclaw)
Co-authors	

A microscopic lepton-nucleus scattering model is investigated both for the neutrino charged-current and electromagnetic interactions. Preliminary results in the chosen channels are shown.

Abstract ID. 128 - 2

Title	Towards CNS Detection: Low-Energy Ionization Yield in Liquid Argon
Author	M. Foxe (Penn State University and LLNL)
Co-authors	G/NARRLI Collaboration

Coherent neutrino scattering (CNS) is an as-yet undetected neutrino interaction predicted by the Standard Model. Detection of CNS could provide benefits for applications such as antineutrino-based nuclear reactor monitoring and astrophysics research (flavor-independent solar and supernova neutrino detection). As the first step in the search for CNS using dual-phase noble element detectors, it is necessary to measure the ionization yield, i.e. the amount of ionization produced in nuclear recoils, in the range of typical CNS recoil energies.

Abstract ID. 129 - 3

Title	Neutrino(Antineutrino) induced single Kaon(Antikaon) production
Author	M. Sajjad Athar (Department of Physics, Aligarh Muslim University, Aligarh, India)
Co-authors	M Rafi Alam, I Ruiz Simo and M J Vicente Vacas

We have studied the weak kaon(antikaon) production off the nucleon induced by $\nu(\bar{\nu})$ at the low and intermediate energies. The calculations have been done using a microscopic model that starts from the SU(3) chiral Lagrangians and includes background terms. In the case of antineutrino induced process the contribution from the resonant channel $\Sigma^*(1385)$ has also been considered. The studied mechanisms are the main source of kaon production for neutrino energies up to 1.5 GeV for the various channels and the cross sections are large enough to be amenable to be measured by experiments such as MINERvA and T2K.

Abstract ID. 130 - 1

Title	R&D status of O,C(p,p') and (He,t) experiment at RCNP
Author	Iwa Ou (Okayama University)
Co-authors	R.Yamaguchi, T.Mori, T.Yano, M.Sakuda, A.Tamii, T.Suzuki, M.Yosoi, A.Ankowski, and O.Benhar

Oxygen and carbon are the most common targets in neutrino experiments. The γ-ray production from NC neutrino-oxygen and -carbon interactions is applicable to the measurement of neutrino oscillations and to the detection of Supernova neutrinos, since the number of NC events is independent of neutrino oscillations . We present R&D status of a hadron beam experiment at RCNP to measure the γ rays from oxygen and carbon in the excitation energies between 5MeV to 30 MeV, including giant resonances and discuss the physics implications of γ -ray production from neutrino-oxygen and -carbon reactions.

Abstract ID. 131 - 2

Title	Theoretical estimate of the gamma-ray production in neutral-current neutrino-oxygen interactions
Author	Artur Marek Ankowski (INFN and Department of Physics,"Sapienza" Universita' di Roma)
Co-authors	Omar Benhar, Takaaki Mori, Ryuta Yamaguchi, and Makoto Sakuda

The observation of the γ rays originating from nuclear deexcitation can be exploited to identify neutral-current events in water-Cherenkov detectors. We present the results of a calculation of the (anti)neutrino-induced γ-ray production cross section for oxygen target, focused on neutrino energy larger than $\sim$200 MeV. The numerical results have been obtained using a realistic model of the target spectral function. We find that at a neutrino energy of 600 MeV, the fraction of neutral-current interactions leading to emission of γ rays of energy larger than 6 MeV is $\sim$41%, and that the contribution of the narrow $p_{3/2}$ state is overwhelming. Our results may turn out to be useful, e.g. to the T2K experiment, for a verification of the total active neutrino flux, and also to the calculation of the proton decay in oxygen, $p \to K^+ + \bar{\nu} + \gamma$ (6 MeV).

Abstract ID. 132 - 3

Title	Status of MINERνA CCQE measurements
Author	G. A. Fiorentini (CPBF)
Co-authors	MINERνA collaboration

MINERνA (Main INjector Experiment for ν-A) is a neutrino scattering experiment in the NuMI high-intensity neutrino beam at the Fermi National Accelerator Laboratory. MINERvA was designed to make precision measurements of low energy neutrino and antinuetrino cross sections on a variety of different materials (plastic scintillator, C, Fe, Pb, He and H_2O). We present the current status of the charge current quasi-elastic scattering in plastic scintillator as well as muon reconstruction efficiencies.

Abstract ID. 133 - 1

Title	Analysis of CCQE Neutrino Interactions in a Liquid Argon Time Projection Chamber
Author	Kinga Partyka (Yale University)
Co-authors	ArgoNeuT collaboration

The Argon Neutrino Test, ArgoNeuT, is a small scale Liquid Argon Time Projection Chamber(LArTPC). ArgoNeuT, an R&D project paving the way for construction of larger detectors, was located 350 feet underground and ran upstream of the MINOS detector in the NuMI beam at Fermi National Accelerator Laboratory from September 2009 to February 2010. ArgoNeuT provides bubble-chamber-like quality images for excellent particle ID and background rejection. ArgoNeuT provides a sample of neutrino events in a LArTPC for the first time in the U.S. and the first time ever in a low-energy beam of 0.1 to 10 GeV. Analysis of ArgoNeuT's Charged Current Quasi-Elastic (CCQE) neutrino sample, in which a neutrino interacts with a neutron and the final state particles are a proton and a muon, will be presented. Vertex activity and calorimetric reconstruction will be addressed for this class of events.

Abstract ID. 134 - 2

Title	Recent Results from the ArgoNeuT Experiment
Author	Andrzej M. Szelc (Yale University)
Co-authors	ArgoNeuT collaboration

The ArgoNeuT (Argon Neutrino Test) Experiment ran on the NuMI beam line at the Fermi National Accelerator Laboratory, from Sep 2009 to Feb 2010. It is the first stage of the US R&D effort on using liquid argon Time Projection Chambers (LArTPCs) as neutrino detectors. ArgoNeuT has collected thousands of beam neutrino events in the 0.1 -10 GeV energy range during its run and, apart from fulfilling its R&D goals, is now publishing physics results, including the first measurement of the inclusive muon neutrino charged current differential cross sections on argon. These, together with the perspectives for ongoing and future analyses will be presented, as well as ideas for running the detector in a test beam.

Abstract ID. 135 - 3

Title	Neutrino Scattering Physics with SciBooNE
Author	Morgan WASCKO (Imperial College London)
Co-authors	The SciBooNE Collaboration

SciBooNE is a neutrino experiment that ran in the Booster Neutrino Beam (BNB) at Fermilab, USA, in 2007-8. SciBooNE was exposed to 2.5e20 protons on target in the BNB, which has mean neutrino energy 0.8 GeV. SciBooNE comprises three sub detectors: SciBar, a scintillating bar active neutrino vertex detector; the Electron Catcher, a lead spaghetti-calorimeter; and the Muon Range Detector, an iron/scintillator sandwich detector. SciBooNE has published six papers on neutrino cross sections and oscillation physics, in which SciBooNE acts as near detector for the MiniBooNE detector. A summary of neutral current and charged current cross-section measurements will be presented.

Abstract ID. 136 - 1

Title	Reconstruction of neutrino interaction kinematical parameters using the OPERA target emulsion information
Author	Budimir Klicek (Rudjer Boskovic Institute)
Co-authors	The OPERA Collaboration

The OPERA detector target consists of about 150 thousand stacks of lead plates and emulsion films, called Emulsion Cloud Chamber (ECC) elements. For each CNGS tagged neutrino event, it is determined in which ECC the interaction took place and the ECC is extracted from the detector. Emulsions contained in the ECC are then developed and scanned using automatized scanning microscopes in OPERA scanning laboratories. This allows reconstruction of tracks and momenta of charged interaction products as well as positions of interaction vertices. Tools for the full Monte Carlo simulation of the reconstruction chain and scanning procedures have been developed. This poster describes the reconstruction chain itself and the software framework for MC simulation of the chain. Comparison between MC and data is presented for various kinematical parameters of neutrino interactions in the OPERA detector.

Abstract ID. 137 - 2

Title	Reactor antineutrinos in the world
Author	Barbara Ricci (Dip. di Fisica and Istituto Nazionale di Fisica Nucleare)
Co-authors	V.Chubakov, J. Esposito, F. Mantovani, M. Lissia, L. Ludhova, S. Zavatarelli

Geo-neutrinos (i.e. $\bar{\nu_e}$ from U and Th natural decay chains) have been recently detected both by Kamland and Borexino experiments. The main source of background of such experiments is given by antineutrino produced by nuclear plants. We present an estimate of reactor antineutrino signal all over the world, with particular attention to the sites proposed for the new geo-neutrino experiments. In our calculation we take into account the most updated data on Thermal Power for each nuclear plant and on reactor $\bar{\nu_e}$ spectra. A preliminary map of reactor neutrinos signal is visible at http://www.fe.infn.it/∼ricci/mappe.pdf.

Abstract ID. 138 - 3

Title	Improvements on Monte Carlo Simulation at Daya Bay
Author	Guofu Cao (Institute of High Energy Physics)
Co-authors	Xiaohui Chen

Using 55 days data taken from 24 Dec. 2011 to 17 Feb. 2012, Daya Bay experiment has measured the neutrino mixing angle θ_{13} with the best precision in the world and observed electron-antineutrino disappearance. Monte Carlo simulation plays an important role in θ_{13} analysis. We have done lots of work to improve our detector simulation, in order to make simulation and experiment consistent well. This poster will describe more details about these improvements.

Abstract ID. 139 - 1

Title	Offline System of the Daya Bay Experiment
Author	Miao HE (Institute of High Energy Physics)
Co-authors	Daya Bay Collaboration

The Daya Bay Reactor Neutrino Experiment is designed to determine neutrino mixing angle θ_{13}. Daya Bay collaboration published their first result on 8 Mar based on 55 days data taking, that θ_{13} is none-zero with a significance of 5.2 standard deviations. Offline system provided a platform for data analysis, including data reconstruction and analysis tools. A detail description of offline software, database, data transfer, generation and management of calibration constants, data quality and data production will be included in this presentation.

Abstract ID. 140 - 2

Title	Calibration and reconstruction of the anti-neutrino detector at Daya Bay
Author	Zeyuan YU (Institute of high energy physics)
Co-authors	DayaBay Collaboration

Precise determination of the least well known mixing angle of PMNS matrix, θ_{13}, is essential for future measurements of CP-violation in the lepton sector. The Daya Bay reactor neutrino experiment is designed to determine θ_{13} with a sensitivity of 0.01 or better in $sin^2 2\theta_{13}$. The designed sensitivity is based on comparing the relative flux of antineutrinos among identical antineutrino detectors at optimized baselines, which are deployed in water pools underground. The experiment started physics data taking on Dec.24, 2011. To understand the detector response, ^{68}Ge, ^{60}Co and AmC sources are utilized along three vertical axes. Details of detector calibration and reconstruction are presented in the poster.

Abstract ID. 141 - 3

Title	Systematics and Backgrounds in Antineutrinos Detection at Daya Bay
Author	Liangjian Wen (Institute of High Energy Physics)
Co-authors	Daya Bay Collaboration

The Daya Bay Reactor Neutrino Experiment aims to precisely determine the neutrino mixing angle θ_{13}. The experiment performs a near-far relative measurement by comparing the observed electron-antineutrino rates and spectra at various baselines from the reactors, with functionally identical antineutrino detectors deployed in water pools underground. The experiment started physics data taking on 24 Dec, 2011. The analysis details of systematics and backgrounds in antineutrinos detection with data up to 15 May, 2012 will be described.

Abstract ID. 142 - 1

Title	Chi-square Fit of Neutrino Oscillation at Daya Bay
Author	Liang Zhan (Institue of High Energy Physics)
Co-authors	Daya Bay Collaboration

The Daya Bay Reactor Neutrino Experiment observed the electron antineutrino disappearance using six functionally identical antineutrino detectors placed at two near and one far underground experimental halls. Using the reactor data provided by the nuclear power plant and the detector target mass and live time information, we predicted the number of inverse beta reactions for six detectors. The antineutrino detection efficiency is estimated by MC and is used to calculate the predicted number of antineutrinos. The observed number of antineutrinos shows a 6% deficit at far hall compared with the near halls as a clear evidence for oscillation. We build a chi-square model to estimate the best fit value and confidence interval of $\sin^2 2\theta_{13}$

Abstract ID. 144 - 3

Title	Characteristics of the Double Chooz liquid scintillators
Author	Christian Buck (MPIK Heidelberg)
Co-authors	C. Aberle, C. Buck, B. Gramlich, F.X. Hartmann, M. Lindner, S. Schoenert, U. Schwan, S. Wagner, H. Watanabe

Gadolinium-loaded liquid scintillators provide efficient background suppression for electron antineutrino detection at nuclear reactor plants. In the Double Chooz experiment, a newly developed beta-diketonate gadolinium-loaded scintillator is utilized for the first time. Scintillator characteristics as optical properties, radiopurity and stability are shown. Experimental results on the energy dependent light output are illustrated for electrons and alpha particles. A light yield model has been developed, which was used to tune the luminescent properties of the Gd-scintillator and a new metal-free companion scintillator.

Abstract ID. 145 - 1

Title	The Double Chooz Far Detector
Author	Dennis Dietrich (Kepler Center for Astro and Particle Physics)
Co-authors	S. Lucht on behalf of the Double Chooz Collaboration

The Double Chooz experiment is a reactor neutrino disappearance experiment. It will consist of two identical detectors, one close (near) and one further (far) away from the two reactors. Each detector is composed of four cylindrical volumes: the "Neutrino Target", the "γ-catcher", the "Buffer" and the "Inner Muon Veto". An "Outer Muon Veto" made from plastic scintillator strips covers the top of the multi-detector system. This poster will show details of the different detector components within each of the Double Chooz detectors and will highlight the performance of the Double Chooz Far detector.

Abstract ID. 146 - 2

Title	Reactor and antineutrino spectrum calculation for the Double Chooz first phase results
Author	Anthony Onillon (SUBATECH, CNRS/IN2P3, Nantes)
Co-authors	Christopher Jones

The Double Chooz experiment has recently released its first results concerning the last unknown oscillation mixing parameter theta13 with its far detector located at 1050m from the two Chooz 4.25GWth reactors. We find an indication for reactor electron antineutrino disappearance consistent with neutrino oscillations. A full core simulation of the PWRs of the Chooz power plant has been developed to compute the reactor fission rates. We propose to present in this poster the reactor and antineutrino spectrum prediction used for the first results of the first phase of the Double Chooz experiment.

Abstract ID. 147 - 3

Title	Determining the Lithium-9 production rate from muon capture in the Double Chooz detector
Author	Robert Svoboda (UC Davis)
Co-authors	Cara Nichole Maesano, Marc Bergevin

Neutrino detectors rely on low background levels in order to detect rare neutrino interactions. A major background for the Double Chooz experiment is 9Li, a beta delayed neutron emitter that mimics the neutrino signal. Radioactive isotopes like 9Li can be produced by muon spallation processes on 12C, but the production from muon capture on 12C has not yet been determined. The overall rate for 9Li production is sensitive to both the stopping and through-going muon rate, however only the rate from through-going muons is well understood. We evaluate the production rate of 9Li from muon capture and constrain the branching ratio.

Abstract ID. 148 - 1

Title	Neutrino Search Using Neutron Capture on Hydrogen in Double Chooz
Author	KAZUHIRO TERAO (Massachusetts Institute of Technology)
Co-authors	R. Carr, K. Crum, A. Ito, S. Lucht, J. Maeda, K. Nakajima, B. Reinhold

The Double Chooz reactor neutrino experiment measures θ_{13} through $\bar{\nu}_e$ disappearance. It is a gadolinium-doped-scintillator experiment, and uses the signature of the inverse beta decay (IBD) interactions $\bar{\nu}_e + p \rightarrow e^+ + n$, where the positron prompt signal is followed with a neutron capture signal on the gadolinium (Gd). In this poster we present a complementary method of using neutron capture on Hydrogen to measure θ_{13} with the Double Chooz detector.

Abstract ID. 149 - 2

Title	Towards θ_{13} with the Double Chooz detector
Author	Alberto Remoto (Subatech/APC)
Co-authors	Tomoyuki Konno, Cara Nichole Maesano, Luis Fernando Gonzalez, Adrien Hourlier

The Double Chooz experiment uses $\overline{\nu}_e$ from the Chooz nuclear power plant to measure the oscillation parameter θ_{13}. By using two detectors at different baselines, a precise measurement of $\overline{\nu}_e$ disappearance is anticipated. The Far detector has been taking physics data since April 2011, while the Near detector is under construction. The first 101 days of data from the Far detector has been analysed and an indication for neutrino disappearance, consistent with the current neutrino oscillation hypothesis, has been found. The best fit value for $\sin^2(2\theta_{13})$ is 0.086 $\pm$ 0.041 (stat) $\pm$ 0.030 (syst). This poster presents the strategy of the Double Chooz oscillation analysis which compares the energy distribution of detected events to the prediction based on the reactor core simulation. This poster focuses on the evaluation of the $\overline{\nu}_e$ signal rate and spectral shape, together with background estimation, selection efficiencies and the total systematic error budget. Finally, the χ^2 test to extract the best estimation of θ_{13} will be described.

Abstract ID. 150 - 3

Title	Data Taking and Analysis at RENO
Author	Jee-Seung Jang (Gwangju Institute of Science and Technology)
Co-authors	RENO Collaboration

The RENO experiment has been taking data since August of 2011 to measure the smallest neutrino mixing angle θ_{13}. An integrated efficiency of data taking is over 90% at both near and far detectors as of now. The RENO DAQ records all the hits having signal over a given threshold, and then selects events by software triggers. RENO triggers and stores all the events with more than 90 hits corresponding to the energy more than 0.5$\sim$0.6 MeV. Backgrounds are identified and removed by the PMT signal pattern in the veto and main detector. In this presentation, we describe the data acquisition system, the status of data taking, and reduction of backgrounds at RENO.

Abstract ID. 151 - 1

Title	Development of an Antineutrino Detector to Monitor the Operation of a CANDU 6 On-Load Refueled Reactor
Author	Nathaniel Bowden (Lawrence livermore National Laboratory)
Co-authors	T. Classen, N. Bowden, A. Bernstein, B. Cabrera-Palmer, D. Reyna, G. Jonkmans, B. Sur, N. Walsh, R. Svoboda

It has been demonstrated by data collected by the SONGS1 detector, created by a collaboration of SNL and LLNL scientists, that antineutrino emissions from nuclear reactors have potential as a monitoring tool. An optimized detector has been created to monitor a CANDU 6 reactor from a fresh-fuel startup to equilibrium. A full test deployment of the detector is being performed at LLNL. The detector is on track for a 2012 deployment at the Point Lepreau Generating Station.

LLNL-ABS-556234
This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory in part under Contract W-7405-Eng-48 and in part under Contract DC-AC52-07NA27344

Abstract ID. 152 - 2

Title	Reactor On/Off Monitoring with a Relatively Small and Mobile Plastic Anti-neutrino Detector Array (PANDA)
Author	Yasuhiro Kuroda (University of Tokyo)
Co-authors	Y.Kuroda, S.Oguri, Y.Kato, R.Nakata, Y.Inoue, C.Ito, M.Minowa

We present our new result of aboveground nuclear reactor monitoring with an anti-neutrino detector prototype consisting of a 360-kg plastic scintillator array into which gadolinium-containing sheets are introduced. We measured the reactor anti-neutrinos for about two months at Ohi Power Station in Fukui, and found the difference of detection rates before and after the shutdown of the reactor.

Abstract ID. 153 - 3

Title	A Short Baseline Reactor Experiment to Probe the Reactor Antineutrino Anomaly
Author	Nathaniel Bowden (Lawrence Livermore National Laboratory)
Co-authors	T. Classen, S. Dazeley, G. Keefer, A. Bernstein

Persistent hints at the existence of sterile neutrino(s) remain an unanswered puzzle in neutrino physics. The most recent hint is the "Reactor Antineutrino Anomaly", which has resulted from an upward revision to reactor antineutrino flux predictions. This tantalizing accumulation of hints is also frustrating, because it is based on event excesses or deficits relative to somewhat uncertain expectations. Here we describe the Southern California Reactor Antineutrino Anomaly Monitor (SCRAAM), an experiment designed to probe sterile neutrino oscillations over much of the Reactor Antineutrino Anomaly phase space via measurement of distortion to the reactor antineutrino energy spectrum. We have identified reactor sites with advantageous combinations of reactor core size, baselines, and overburden.

Abstract ID. 154 - 1

Title	SBL project at a research reactor
Author	Kyungju Ma (Sejong University)
Co-authors	SBL Collaborators

SBL(reactor short base line oscillation) project is proposed to find the sterile neutrino with the investigation of the neutrino oscillation at short base line in KOREA. SBL uses the korean research reactor, HANARO. it has a compact core(20cm×40cm×60cm) of 30MW thermal power and it is a critical issue. it is sensitive over $10eV^2$ mass difference. the event rate of the 500kg of liquid scintillator detector(LS) located at 5m from the reactor core would be about 500/day in which the recent reactor anomaly can be investigated. the prototype detector with 50L LS has been designed. to distinguish the neutron and gamma signal in LS pulse shape discrimination(PSD) technique is studied with safer LSC cocktails.

Abstract ID. 155 - 2

Title	Current status of the ANGRA project: monitoring nuclear reactors with antineutrino detectors
Author	J.C. Anjos (Centro Brasileiro de Pesquisas Fisicas)
Co-authors	G.A. Valdiviesso, The Neutrinos Angra Collaboration

We will describe the status of the Angra Project, aimed at developing an antineutrino detector for monitoring nuclear reactors. The experiment will use the Brazilian reactor Angra II, with 4 GW thermal power, as source of antineutrinos. A 1 ton target water Cherenkov detector placed in a container located at 30 m of the reactor core is being built. A few thousand inverse beta decay antineutrino reactions per day are expected. We will show the status of the detector construction, local background measurements and results on the performance of the electronics. The detector deployment is scheduled by the end of 2012.

Abstract ID. 156 - 3

Title	Measuring electronics latencies in MINOS with Auxiliary Detectors.
Author	Rashid Mehdiyev (The University of Texas at Austin, Austin, TX, USA)
Co-authors	Son Cao, Karol Lang, Xinjie Qiu

The MINOS experiment uses two detectors separated by 734km to study neutrino oscillations between Fermilab and the Soudan Underground Laboratory. MINOS is also conducting a neutrino TOF measurement between the two detectors. Two identical pairs of small Auxiliary Detectors (AD) installed near both MINOS detectors to calibrate the difference of timing systems of the Near and Far Detectors. The AD's made of scintillator strips read out by WLS fibers and 16-anode PMT's. The AD's are placed to observe muons from events in the MINOS detectors. AD hits are independently time-stamped using a CAMAC TDC and Brilliant Instruments time interval analyzer. The comparison between time stamps in AD's and MINOS detectors provide the latency measurement of read out electronics.

Abstract ID. 157 - 1

Title	Improved timekeeping for neutrino time of flight measurements in MINOS
Author	Giles Barr (Oxford University)
Co-authors	P.Adamson, A.Habig, C.James, R.Nichol, R.Plunkett, C.Rosenfeld

The MINOS experiment has recently upgraded the time-keeping and time-stamping devices to improve upon the neutrino time of flight measurement reported in 2007. The new system provides the ability to constantly measure, monitor and record the delays, phases and stability of the time-stamping devices located at widely separated detectors which mark the start and finish of the transit. A procedure for

Abstract ID. 158 - 2

Title	Timing calibration of the OPERA drift tube trigger system
Author	Jan Lenkeit (Hamburg University)
Co-authors	C. Hagner, B. Wonsak et al.

The OPERA detector was specifically designed for the search for oscillated ν_τ in a pure ν_μ beam. As part of the magnetized spectrometer, the drift tube detector serves the muon reconstruction. The drift tube readout is triggered by Resistive Plate Chamber (RPC) detectors. For this purpose, several RPC planes are equipped with dedicated Timing Boards, digitizing the detector signal directly at the end of the readout strips to preserve the good time resolution of the RPCs. In addition to their use as trigger for the drift tubes, these signals are recorded by TDCs. By means of a timing calibration of the full signal chain, a precise measurement of the particle interaction time in the OPERA spectrometer is made possible. Results of these measurements with beam neutrino induced muons are presented.

Abstract ID. 159 - 3

Title	On the neutrino time of flight measurement with LVD
Author	Walter Fulgione (INFN Torino)
Co-authors	M.Aglietta, P.Antonioli, G.Bruno, P.Giusti, A.Molinario, GC.Trinchero, C.Vigorito, V.Yakushev - For the LVD Coll.

The Large Volume Detector (LVD) in operation since 1992 in the INFN Gran Sasso National Laboratory (LNGS), is a ν observatory to study neutrinos from gravitational stellar collapses. Since 2006 LVD acts as a far beam monitor for the Cern Neutrinos to Gran Sasso (CNGS) project, the high energy, wide band ν_μ beam, set up at Cern and sent towards the LNGS. Recently the detector timing capabilities have been upgraded in order to allow a LVD measurement of the CNGS neutrinos speed. Preliminary results obtained during the operation of the neutrino beam with a short-time bunch structure will be presented.

Abstract ID. 160 - 1

Title	T2K neutrino time of flight study
Author	Oleg Perevozchikov (Louisiana State University)
Co-authors	The T2K Collaboration

The T2K experiment is a long baseline neutrino oscillation experiment primarily built to search for conversion of muon neutrinos to electron neutrinos by measuring mixing angle theta13. High intensity beam of muon neutrinos is produced at the JPARC and sent 295 km across Japan towards the Super-Kamiokande detector. In addition to measuring neutrino mixing parameters the T2K started working on a neutrino TOF analysis. It aims to determine the neutrino velocity and in the context of relativistic mass model provides an opportunity to set an upper limit on neutrino mass. The T2K neutrino flux peaks at 600MeV and hence provides a measurement that is complimentary to those from the MINOS and OPERA experiments which are at significantly higher energies. The T2K experiment features a large variety of detectors at the near site which are all used to perform timing cross checks. We will present studies of T2K's sensitivity for a neutrino TOF measurement and provide an assessment of the quality of the timing data collected to date.

Abstract ID. 161 - 2

Title	Evaluating Gadolinium's Action on Detector Systems (EGADS)
Author	Andrew Renshaw (University of California, Irvine)
Co-authors	The Super-Kamiokande Collaboration

The proposed introduction of a soluble gadolinium [Gd] compound into water Cherenkov detectors results in a high efficiency for the detection of free neutrons capturing on the Gd. The delayed 8 MeV gamma cascades produced by these captures, in coincidence with a prompt positron, signal serve to uniquely identify electron anti-neutrinos interacting via inverse beta decay. This coincidence detection should allow a large Gd-enhanced water Cherenkov detector to make the first observation of the diffuse supernova neutrino background, high precision measurements of Japan's reactor anti-neutrino flux, and enhance current physics studies. A dedicated Gd test facility is operating in the Kamioka Mine, home of the Super-Kamiokande [SK] detector. This new facility houses a 200 ton version of SK, and will include 240 50-cm photomultiplier tubes, water systems for filtration and gadolinium dissolution and recovery, and devices for evaluating the quality of the water. The status of this project will presented.

Abstract ID. 162 - 3

Title	Reconstruction in the ND280 at T2K
Author	Benjamin Smith (Imperial College London)
Co-authors	The T2K collaboration

ND280 is the off-axis near detector of the T2K experiment. It is composed of 6 separate subsystems, each with unique characteristics. There are two separate technologies—gas-filled Time Projection Chambers and polystyrene scintillator bars—and each subsystem has a different density and resolution. As such, reconstructing ND280 events poses an interesting and complex challenge. This poster outlines the various reconstruction techniques used in each subsystem, and explains how these results are merged into a global reconstruction package representing the whole detector. The latest performance results are shown.

Abstract ID. 163 - 1

Title	Development of a radon detector for purified gases
Author	Keishi Hosokawa (Kobe university)
Co-authors	A. Murata, Y. Nakano, H. Sekiya, Y. Takeuchi, S.Tasaka

For underground particle physics experiments, radioactive noble gas radon in U-series could be a source of serious background events.We had developed high sensitivity detectors for radon in air or in water using an electrostatic collection method and a PIN photodiode for these particle physics experiments [NIMA 497(2003)414, PLB 452(1999)418, NIMA 421(1999)334]. In order to achieve more high-sensitive radon measurements, we made an experimental new radon detector.This new radon detector could be also used for radon emanation measurements from samples in vacuum environment, which we could not done with past radon detectors. The detector calibrations in vacuum and in purified gas were on going. We will report the current status of the development.

Abstract ID. 164 - 2

Title	Improvement of the energy resolution of CdTe detectors
Author	Takahiro Hiraki (Kyoto University High Energy Physics Group)
Co-authors	T.Kikawa, A.K.Ichikawa, T.Nakaya

Semiconductor detectors made of cadmium telluride (CdTe) have been developed and used as radiation detectors having high gamma-ray detection efficiency. However, energy resolution of thick CdTe detectors is rather poor because of the significant hole trapping effect. If energy resolution is improved, CdTe detector can be used for experiments searching for neutrinoless double-beta decay because it contains promising isotopes such as ^{130}Te and ^{116}Cd. We have developed a new method to improve the energy resolution by correcting the pulse height using the waveform of the signal. We evaluated the energy resolution of two kinds of 5mm×5mm×5mm CdTe detectors and a 15mm×15mm×10mm detector, and what determines the energy resolution.

Abstract ID. 165 - 3

Title	Design of a huge water purification system based on the Super-Kamionade system
Author	Hiroyuki Sekiya (ICRR, University of Tokyo)
Co-authors	The Hyper-Kamiokande Working Group

We propose the Hyper-Kamiokande (Hyper-K) detector as a next generation underground water Cherenkov detector. It will serve as a far detector of a long baseline neutrino oscillation experiment envisioned for the upgraded J-PARC, and as a detector capable of observing — far beyond the sensitivity of the Super-Kamiokande (Super-K) detector — proton decays, atmospheric neutrinos, solar neutrinos, both supernova burst neutrinos and supernova relic neutrinos, and dark matter. Water is the target material and signal-sensitive medium of the detector, and thus its quality directly affects the sensitivity. The Hyper-K water system design should be based on the Super-K water system. In this poster, first, the technologies of the Super-K water system are described. Next, the strategy for the realization of the huge system that has the 1200m^3/h purification ability and a prototype design of the Hyper-K water system are presented.

Abstract ID. 166 - 1

Title	Develpment of InP solid state detector and liquid scintillator contaning metal complex
Author	Yoshiyuki Fukuda (Miyagi University of Education)
Co-authors	Y.Fukuda, S.Moriyama, H.Sekiya, T.Namba, T.Izawa, M.Asakura

A large volume solid state detector using a semi-insulating Indium Phosphide (InP) wafer have been developed for measurement of solar neutrinos. We have designed hybrid detector which consist of InP detector and liquid xenon scintillator. An organic liquid scintillator containing indium and zirconium quinolinolato complexes were also developed for measurement of solar neutrinos and neutrinosless double beta decay, respectively. The energy spectra of gammas for those complexes in benzonitrile was measured. A 5-aryl-8quinollinolate complex has shorter wavelength of the luminescence and better quantum efficiency than original one.

Abstract ID. 167 - 2

Title	The MicroBooNE Physics Program
Author	Georgia Karagiorgi (Columbia University)
Co-authors	MicroBooNE Collaboration

The MicroBooNE experiment, a 170 ton liquid argon TPC, is currently under construction in the Booster Neutrino Beamline at Fermilab. This poster describes the experiment's physics goals, including neutrino cross-section measurements on argon, and studies of backgrounds to rare event searches with future-generation liquid argon TPC experiments. Particular focus is given to MicroBooNE's sensitivity to interpretations of the "low energy excess" previously observed by the MiniBooNE experiment, as well as MicroBooNE's sensitivity to light sterile neutrino oscillations.

Abstract ID. 168 - 3

Title	The Time Projection Chamber for the MicroBooNE experiment at Fermilab
Author	Jonathan Asaadi (Syracuse University)
Co-authors	The MicroBooNE Collaboration

The MicroBooNE experiment at Fermilab will use a 170 ton, liquid argon time projection chamber (TPC) to investigate neutrino interactions coming from Fermilab's Booster Neutrino Beam (BNB) as well as an off axis component of the NUMI neutrino beam. MicroBooNE studies neutrino interactions through the observation of outgoing charged particles that ionize in the liquid argon as well as neutral particles that convert in the argon. These ionization electrons then drift through a uniform electric field to three wire planes allowing sub-millimeter position resolution in the reconstructed interaction. In this poster we present the details of the fabrication, assembly, and testing of the MicroBooNE TPC.

Abstract ID. 169 - 1

Title	Purification system of KamLAND-Zen experiment
Author	Kota Ueshima (Tohoku University)
Co-authors	KamLAND-Zen collaboration

KamLAND-Zen experiment was started data taking from October 2011. From the first result of KamLAND-zen, there were BG peak at 2.6 MeV region. Current sensitivity of effective neutrino mass was limited at 0.3-0.6 eV. The purification system of xenon and liquid scintillator were developed to remove the BG. Considering the nuclei with lifetimes more than 30 days, the BG candidates were identified ^{110m}Ag, ^{208}Bi or ^{88} Y. We plan to collect ^{136}Xe gas from the liquid scintillator. After the collection is finished, ^{136}Xe gas and liquid scintillator is distilled using distillation system, respectively. In addition, ^{136}Xe gas will be purified using SAES getter just before dissolving ^{136}Xe into liquid scintillator. I will report collection, distillation, purification and dissolving system of ^{136}Xe gas.

Abstract ID. 170 - 2

Title	DAQ Upgrade in KamLAND
Author	Benda XU (Research Center for Neutrino Science, Tohoku University)
Co-authors	The KamLAND MoGURA Group

MoGURA is a DAQ system developed at RCNS for KamLAND experiment, with FPGA as its main IC and implemented with VHDL, a hardware description language. We have already ported embedded Linux to the FPGAs for proof of concept. In this work, we explore a software/hardware co-design for improvements of the present system. The advantage of software is ease of development and maintenance. While the advantage of VHDL approach is efficiency. A hybrid scheme is reasonable for a balance. Applications of this work includes data ethernet read-out and smart trigger.

Abstract ID. 171 - 3

Title	Research and Development towards Multi-PMT Optical Module Prototypes for PINGU
Author	Lew Classen (Erlangen Centre for Astroparticle Physics)
Co-authors	E.de Wolf, O. Kalekin, U. Katz, P. Kooijman

The PINGU extension of IceCube aims at adding further instrumentation to DeepCore, with the objective to reach a neutrino energy threshold as low as 10 GeV. In this framework a new type of optical modules is to be tested containing multiple small PMTs in a glass vessel of cylindrical shape. The design is based on the KM3NeT optical module. This approach offers advantages that might be essential for future installations aiming at neutrino detection at even lower energies. The basic design of the Multi-PMT optical module for PINGU will be presented and the technical aspects of the design adaptation to deep ice explained.

Abstract ID. 172 - 1

Title	PMT calibration of Daya Bay Experiment
Author	Bei-Zhen Hu (Institute of Physics, National Chiao Tung University)
Co-authors	Daya Bay collaboration

The Daya Bay Reactor Neutrino Experiment is one of the experiments to determine the neutrino mixing angle θ_{13}. It was designed to measure $sin^2 2\theta_{13}$ to better than 0.01 at 90 % C.L. To achieve this, it is important to keep various sources of systematic uncertainty error below our specifications. Photomultiplier tubes (PMTs) are crucial components of anti-neutrino detectors. We have studied many properties of PMT, such as gain, ringing, flasher. These studies are presented in the poster.

Abstract ID. 173 - 2

Title	Pileup Background Rejection for SNO+
Author	Philip Jones (Queen Mary, University of London)
Co-authors	The SNO+ collaboration

The SNO+ experiment will search for neutrinoless double beta using a neodymium loaded scintillator placed into the former SNO detector. The scintillator and neodymium will come with many background isotopes. The majority of these backgrounds fortunately have energy spectra that fall outside of the SNO+ signal window. However some of the isotopes are likely to have a high rate, even with the planned purification. These high rate backgrounds can pileup creating a new background energy spectra with events in the SNO+ signal region. In this poster, predictions for the expected pileup backgrounds are shown based on the predicted in situ background contaminations. Furthermore, techniques for identifying these backgrounds separately from the signal are shown along with the Monte Carlo predictions of their effectiveness in reducing the backgrounds. Finally predicted limits with and without pileup will be shown.

Abstract ID. 174 - 3

Title	A Cherenkov light source for the SNO+ liquid scintillator detector
Author	William Heintzelman (University of Pennsylvania)
Co-authors	R. Helmer, J. Klein, O. Wasalski

Work is underway to produce a Cherenkov light source for use in the SNO+ experiment. Based on a modification of the ^{8}Li electron source used successfully in SNO, it will provide a well understood source of non-isotropic light for calibrating detector response independent of the light yield of the SNO+ LAB/PPO scintillator. The occurrence of ^{8}Li decays is detected by a PMT built into the source, which allows Cherenkov source events to be tagged and background events to be eliminated from samples. Some events initiated by the source result in Compton-scattered electron tracks and scintillation light in the LAB/PPO, but cuts, primarily on the number of PMT hits, should reduce these to a manageable level.

Abstract ID. 175 - 1

Title	CUORE crystal validation runs: results and extrapolation to CUORE background
Author	L. Canonica (INFN - LNGS)
Co-authors	CUORE Coll.

The CUORE Crystal Validation Runs (CCVRs) consist in bolometric measurements carried out since the end of 2008 at the Gran Sasso National Laboratories, in order to test the performance and the radiopurity of the TeO_2 crystals produced for the CUORE experiment. Considering the goal of CUORE in terms of background (lower than 0.01 counts/keV/kg/y), the radiopurity of the crystals is a crucial issue. The crystals must satisfy very stringent requirements regarding the bulk and surface contamination levels of ^{238}U and ^{232}Th. The recent results obtained on bulk and surface contaminations will be presented.

Abstract ID. 176 - 2

Title	Long Term Performance of the MINOS Calibration Procedure
Author	Sarah Phan-Budd (Argonne National Lab)
Co-authors	Jeff de Jong, Sarah Phan-Budd, Luke Corwin, Mark Mathis, Richa Sharma, Nathaniel Tagg (for the MINOS collaboration)

The MINOS detectors are steel-scintillator sampling tracking calorimeters and are calibrated using an in-situ light-injection system and cosmic ray muons. The MINOS near and far detectors have been operating almost continuously since 2003 and 2005, providing opportunity to quantify the behavior of the various detector components, many of which are used in the next generation neutrino oscillation experiments, under long-term experimental operation. We will report on the calibration procedure and its stability, as well as the time and temperature dependencies of the scintillator, wavelength-shifting fibers and photo-multiplier tubes.

Abstract ID. 177 - 3

Title	Potential of a Neutrino Detector in the ANDES Underground Laboratory
Author	Renata Zukanovich Funchal (Universidade de Sao Paulo)
Co-authors	P.A.N. Machado, H. Nunokawa and T. Muhlbeier

The proposed Agua Negra Deep Experimental Site (ANDES) will be the first deep underground laboratory in the Southern Hemisphere. It will be built off one of the two Agua Negra tunnels that will link Argentina to Chile through the ANDES with an overburden of 1.7 km of rock. We study the physics potential of a liquid scintillator neutrino detector of a few kilotons of fiducial mass, that could be built in this laboratory, for the investigation of low energy neutrinos like geo neutrinos and galactic supernova neutrinos. We emphasize some advantages of the location with respect to other neutrino detectors.

Abstract ID. 178 - 1

Title	Calibration and Reconstruction in the NOνA Detectors
Author	Enrique Arrieta Diaz (Michigan State University)
Co-authors	The NOνA Collaboration

The NOνA long-baseline neutrino experiment will study electron neutrino appearance using two high resolution, fully active scintillator detectors: a Near Detector at Fermilab and a Far Detector at Ash River MN. Precision measurements of neutrino oscillations with these detectors require careful calibration and sophisticated event reconstruction techniques. This poster presents the detector energy calibration scheme and discusses the strategy planned for the reconstruction of neutrino events. The performance of these routines will be demonstrated using cosmic and neutrino data collected in the Near Detector On the Surface prototype currently taking data at Fermilab.

Abstract ID. 179 - 2

Title	The KM3NeT digital optical module
Author	Els de Wolf (Nikhef/University of Amsterdam)
Co-authors	Paul Kooijman

The KM3NeT optical module differs from the traditional optical modules used in neutrino telescopes. It utilizes many small 3 inch photomultipliers to achieve a photocathode area equivalent to 3-4 10 inch photomultipliers. A very low power custom high voltage base provides adjustable HV for all 31 PMTs. The output is amplified and discriminated in an ASIC and is fed to an FPGA in which a time to digital converter is implemented. The digital optical module is readout via fibre optics. Simulations have shown that this optical module has superior performance to the traditional optical modules. The recognition of two or more photons, important for extracting the neutrino signal from background, is reduced to counting hit PMTs and has large efficiency and 100% purity. The optical module will be deployed for tests in the ANTARES detector.

Abstract ID. 180 - 3

Title	Photomultipliers for the KM3NeT neutrino telescope
Author	Oleg Kalekin (Erlangen Centre for Astroparticle Physics)
Co-authors	The KM3NeT Consortium

The KM3NeT project aims to build the most sensitive high energy neutrino telescope. A few thousand innovative multi-PMT digital optical modules will be arranged in a few kilometers depth in the Mediterranean Sea resulting in a sensitive volume of several cubic kilometers. Each optical module will contain 31 small PMTs. Three companies – ET Enterprises Ltd (ETEL), Hamamatsu, and MELZ – develop new PMTs to meet the KM3NeT specifications. A few tens PMTs of following types were delivered: D783FL (3-inch, ETEL); R6233MOD (3-inch) and R12199 (80mm, both Hamamatsu). PMTs were characterized on quantum efficiency, detection efficiency, effective photocathode size, transit time spread, dark noise rate, and gain to select photomultipliers to build first fully operating optical modules.

Abstract ID. 181 - 1

Title	Muon veto detector for LENA
Author	Tuomo Kalliokoski (University of Jyvaskyla)
Co-authors	The LAGUNA-LENA working group

LAGUNA LBNO has selected LENA one of the priority detectors to be located in the Pyhäsalmi mine in Finland at the depth of 1.4 km (4000 m.w.e.). Even at this depth the detector will be bombarded by a flux of about 0.0001 cosmic ray induced muons/sm^2 corresponding rate of 0.7 Hz for LENA. Because of this a veto detector has to be designed, installed, and incorporated to the event trigger. In this poster, in addition to the results of our detailed CORSIKA and GEANT4 simulations, we shall review the proposed options for the veto detector for LENA. The main requirements include high efficiency, reliability, stable and maintenance-free operation for the extended periods of time as well as low cost.

Abstract ID. 182 - 2

Title	The Design of the 50 kt Liquid Scintillator Detector LENA
Author	Daniel Bick (University of Hamburg)
Co-authors	The LENA working group

LENA (Low Energy Neutrino Astronomy) is a future detector for the observation of neutrinos from terrestrial and astrophysical sources. The design foresees the use of 50 kt of liquid scintillator for neutrino detection. LENA is one of the options currently under investigation in the European LAGUNA/LBNO design study for the next generation, very large volume, deep underground neutrino observatory. The project is currently in the design phase. We present an updated version of the detector design: the liquid scintillator will be contained in a concrete tank. An optically shielded scaffolding is foreseen inside the tank. Fully encapsulated optical modules containing PMTs and an enclosure of non-scintillating oil will be installed in this scaffolding.

Abstract ID. 183 - 3

Title	Physics potential of the next-generation neutrino observatory LENA
Author	Michael Wurm (Hamburg University)
Co-authors	The LAGUNA-LENA working group

LENA (Low Energy Neutrino Astronomy) is one of the detector options discussed in the FP7 design study LAGUNA-LBNO for the realization of a next-generation large-volume neutrino observatory in Europe. Based on 50 kilotons of liquid scintillator, LENA will be able to perform high-statistics measurements on a broad range of terrestrial and astrophysical neutrino sources. The excellent background discrimination inherent to liquid-scintillator detectors will allow to search for very rare events generated by the interactions of diffuse SN neutrinos or proton decay. At GeV energies, newly developed event reconstruction and pulse-shaping algorithms open a window to the study of neutrino oscillation physics in a long-baseline neutrino beam experiment, using LENA as a far detector.

Abstract ID. 184 - 1

Title	Arachne - A web-based event display for education and presentation
Author	Nathaniel Tagg (Otterbein University)
Co-authors	The MINERvA experiment

Visualizing neutrino interactions is frequently-use for monitoring detectors, debugging reconstruction algorithms, and gaining insight into the physics of the experiment. Here we present a demonstration of a web-based event viewer which efficiently accomplishes these aims, and has also been proven useful in outreach and education. Secondary and undergraduate students have used this tool to learn about particle decay and momentum conservation in real neutrino interactions observed by the MINERνA experiment.

Abstract ID. 185 - 2

Title	Development of the Emulsion Neutrino Spectrometer for future neutrino experiments
Author	Tsutomu Fukuda (Toho University)
Co-authors	C.Fukushima, H.Ishida, M.Kimura, T.Matsuo, S.Mikado, S.Ogawa, H.Shibuya

In future neutrino oscillation experiments, it is essential to identify the incident neutrino flavor and also to distinguish neutrino from anti-neutrino interactions. Nuclear emulsion detectors can identify $\nu_e/\nu_\mu/\nu_\tau$ interactions as clearly demonstrated in the DONuT and OPERA experiments. The Emulsion Neutrino Spectrometer will add a new capability to distinguish neutrino/anti-neutrino interactions. It is accomplished by measuring the deflection of the produced lepton in a magnetic field and determining the sign of its electric charge. Results of test experiments and a Monte Carlo study are reported.

Abstract ID. 186 - 3

Title	Nuclear Emulsion Scanning Facility and Development of Ultra High Speed System in Nagoya University
Author	Kunihiro Morishima (Nagoya University)
Co-authors	Kunihiro Morishima, Kaname Hamada, Hikaru Masuda, Ryosuke Komatani, Masahiro Yoshimoto, Koichi Kodama, Toshiyuki Nakano

We have developed a high-speed automated nuclear emulsion scanning system S-UTS (scanning speed is $72cm^2/hour$) and are operating 5 S-UTS in the scanning facility in Nagoya University ($60m^2/year$ in total). These systems are being applied to OPERA experiment. And also, we are developing a next generation system, HTS, which will realize the scanning speed of $1m^2/hour$ (several $1000m^2/year$). These systems are applied to neutrino physics, dark matter search, gamma-ray telescope, cosmic ray muon tomography, and so on.

Abstract ID. 187 - 1

Title	High sensitivity nuclear emulsion gel - its development and production
Author	Naotaka Naganawa (Nagoya University)
Co-authors	N. Naganawa, K. Kuwabara, T. Naka, T. Asada, K. Hakamata, H. Kawahara, N. Tomita, M. Nakamura

We started production of nuclear emulsion gel in Nagoya University since March of 2012 with retired experts from FUJIFILM. We succeeded in producing one with its sensitivity 2.5 times higher than the current one used in the OPERA experiment. Also replacement of all the potassium compounds with sodium ones was done to reduce potassium 40. Usage of this gel in practice started from 2011 in test experiments for gamma ray telescope, proton therapy, and muon tomography, and provided good quality in automatic scanning. Further study should enable usages in double beta decay experiments or fractional charge search.

Abstract ID. 188 - 2

Title	Construction & Properties of Acrylic Vessels in the RENO Detector
Author	In Sung Yeo (Chonnam National University)
Co-authors	Kyung Kwang Joo

RENO is to measure neutrino mixing angle θ_{13}. The RENO detector consists of four layers; target, γ-catcher, buffer and veto. Acrylic is used for the target and the γ-catcher vessels of liquid scintillator. In order to reduce the systematic uncertainties, the target volume should be identical in the level of less than 0.1% for near and far detectors. We present optical properties, design, construction, and test of acrylic vessels used for the RENO.

Abstract ID. 189 - 3

Title	Calibration Efforts at RENO
Author	June Ho Choi (Dongshin University)
Co-authors	The RENO Collaboration

The RENO(Reactor Experiment for Neutrino Oscillation) experiment is to measure the smallest neutrino mixing angle θ_{13} using anti-neutrinos emitted from the Yonggwang nuclear power plant in korea. The performance of RENO detector has been investigated using several sources. The energy response was studied using several radioactive sources and background events produced by cosmic muons. Detection efficiency of neutron capture is measured using a Cf source. RENO has developed a 3-dimensional moving system for the radioactive sources in the detector in addition to the usual 1-dimensional moving system. In this presentation, we describe the methods of detector calibration and their results.

Abstract ID. 190 - 1

Title	Measurement of baselines between reactor and detector, and calculation of reactor neutrino fluxes at RENO
Author	Wonqook Choi (Seoul National University)
Co-authors	The RENO Collaboration

The RENO experiment has been taking data since Aug. 2011 to measure the smallest neutrino mixing angle θ_{13} at Yonggwang nuclear power plant. Six reactors are linearly alligned and equally spaced in a 1,280m span.Near and far detectors are 290m and 1,380m away from the reactor array center. Coordinates of reactors and detectors are measured in an accuracy better than 10cm, to determine the baseline between a reactor and a detector accurately. Bsed on the precisely measured baselines we can calculate the reduction effect of reactor neutrino fluxes in better than 0.14% at near and far detectors. In this presentation, we describe how to measure the coordinates of reactors and detectors accurately, and how to calculate the reactor neutrino fluxes at each detector.

Abstract ID. 191 - 2

Title	Production of Gd loaded liquid scintillator at RENO
Author	Jungsic Park (Seoul National University)
Co-authors	The RENO Collaboration

The RENO (Reactor Experiment for Neutrino Oscillation) has been taking data since Aug. 2011, to measure the smallest neutrino mixing angle θ_{13} using electron antineutrinos emitted from the Yonggwang nuclear power plant in Korea. Reactor neutrinos are detected by the inverse beta decay reaction in which a delayed signal from neutron capture is crucial for removing accidental backgrounds. To increase tagging efficiency of the neutron capture events RENO uses Gd loaded liquid scintillator in the target region of 16 tons. In this presentaiton, we describe methods to load the Gd metal in the liquid scintillator, mass production of the liquid, and filling the detector with the liquid.

Abstract ID. 192 - 3

Title	Comparison of muon simulation with data in RENO
Author	Eunju Jeon (Sejong University)
Co-authors	The RENO Collaboration

RENO is a reactor based neutrino oscillation experiment to measure the neutrino mixing parameter $\sin^2(2\theta_{13})$, which began data-taking with NEAR and FAR detectors from August 1, 2011. Anti-electron neutrino events from reactors can be identified by the coincidence of prompt and delayed signals produced by inverse-beta decay interaction at detector. Cosmic muons can generate fake signals in various ways, and muon identification is important to remove the backgrounds. We studied cosmic muons by GEANT4 simulation and compared with data to identify muons passing different layers of the detector. In this poster we present a series of studies on these activities

Abstract ID. 193 - 1

Title	High-sensitivity Beta Counting System for RI impurity Studies of $SrMoO_4$ Scintillating Bolometer
Author	Ryuta Hazama (Osaka Sangyo University)
Co-authors	R. Hazama, H. Ejiri, K Fushimi, T. Shima

High sensitivity DBD(double beta decay) detectors for ^{100}Mo are under development by the MOON collaboration. ^{100}Mo loaded bolometers are very sensitive DBD detectors because of the high energy-resolution and e/γ and α identification by measuring both thermal and scintillation signals, and are complementary to MOON-PL. Possible candidates are $SrMoO_4$, $ZnMoO_4$, $CaMoO_4$. To test BG contributions from ^{90}Sr impurities in the natural Sr, non-quenching liquid scintillation counting system has been developed and tested for the measurement of beta-emitting strontium activities, ^{90}Sr/^{90}Y, in strontium carbonate.

Abstract ID. 194 - 2

Title	The MINERvA Test Beam Experiment and Calibrations
Author	Deborah Harris (Fermilab)
Co-authors	The MINERvA Collaboration

The MINERvA experiment aims to make precision measurements of low energy neutrino interactions.The MINERvA Test Beam (TB) experiment was designed to serve as a calibration for the calorimetric observables used in the analysis of interactions in MINERvA. A low-energy tertiary beam line was especially designed to provide identified charged particles (muons, pions and protons) within a momentum range of 0.4-1.2 GeV. The TB detector, a replica of the MINERvA detector took data in this beam line from June-July 2010. The goal is to provide MINERvA with a precise calibration of the hadronic response. In this poster, we report on the in-situ calibration of the MINERvA detector and how the TB energy scale measurements help set the energy scale of the neutrino detector.

Abstract ID. 195 - 3

Title	A Prototype Detector for Observation of Coherent Neutrino-Nucleus Scattering at a Nuclear Reactor
Author	Samuele Sangiorgio (Lawrence Livermore National Laboratory)
Co-authors	A. Bernstein, J. Coleman, M. Foxe, C. Hagmann, T. Joshi, I. Jovanovic, K. Kazkaz, K. Mavrokoridis, V. Mozin, S. Pereverzev

We will provide an overview of our project, its discovery potential, and the challenges we face in looking for Coherent Neutrino-Nucleus Scattering at a nuclear reactor. The design and operation of our dual-phase Argon ionization detector will be discussed along with its commissioning and performances. Measurement of the ionization yield using neutron elastic scattering is also addressed. This work was performed under the auspices of the U.S. Department of Energy by LLNL under Contract DE-AC52-07NA27344. Funded by LDRD.

Abstract ID. 196 - 1

Title	Simulations for the INO Experiment
Author	Tarak Thakore (Tata Institute of Fundamental Research)
Co-authors	INO Colloboration

The India-based Neutrino Observatory(INO) is a proposed experiment to study the neutrino oscillations with the atmospheric neutrinos. The detector is a 50 KT magnetized iron calorimeter with the Resistive Plate Chambers(RPC) as active detection elements. The detector has good energy and directon resolutions, detection efficiency and charge identification capabilities for muons. The primary goals of the experiment are to make precision measurement of the oscillation parameters ($sin^2\ 2\theta_{23}$,Δm^2_{32}) and to study the neutrino mass hierarchy. Here we present some results from the detector simulations and oscillation analysis simulations.

Abstract ID. 197 - 2

Title	WCSim: a Geant4 based water Cherenkov detector simulation
Author	Tarek Akiri (Duke University)
Co-authors	Alexander Himmel, Joshep Lozier, Kate Scholberg, Christopher Walter, Roger Wendell

WCSim is a Geant4 based water Cherenkov detector simulation originally developed to test the physics potential of a 1 kton water detector located 2 km away from the T2K beam target. Recently, its code has been updated to accommodate the needs of the LBNE water Cherenkov detector option by allowing the simulation of large cylindrical tank configurations with an adjustable number of PMTs. Moreover, the optical properties have been tuned at about 3% level to the Geant3 based Super-Kamiokande simulation that is finely tuned to data. The WCSim code is available to the community for the development of future water Cherenkov projects.

Abstract ID. 198 - 3

Title	The mini Time Cube: A Portable Directional Neutrino Detector
Author	Stefanie Smith (University of Hawaii at Manoa)
Co-authors	S. Dye, J. G. Learned, S. Matsuno, M. Sakai, M. Rosen

The mini Time Cube (mTC) is a small, portable, high resolution neutrino detector currently under construction and development at the University of Hawaii at Manoa. The mTC consists of 13 cubic cm of boron-doped plastic scintillator, which is surrounded by Planacon's 64 anode channel plate photodetectors, capable of resolving signals at a resolution of 40 ps. There are a total of 256 pixels on each side of the cube. Each pixel is waveform digitized and sent forward for pipeline processing. The small size and fast data extraction permit online disposition of background events, allowing the detector to be used with little or no shielding. The applications are numerous, ultimately ranging from high precision measurements of radioactive materials in the Earth's crust and mantle to reactor neutrino oscillation studies.

Abstract ID. 199 - 1

Title	Radon induced surface contaminations in bolometric arrays for DBD search
Author	L. Pattavina (INFN - Milano Bicocca)
Co-authors	

In fully active detectors, like cryogenic particle detectors, surface contaminations are a critical issue. ^{222}Rn is by far the most intense source of airborne radioactivity, and if a radio-pure material is exposed to environment where the Radon concentration is not minimized, ^{210}Pb and ^{210}Po contaminations can occur. The mechanisms and the dynamics of Radon-induced surface contaminations are reviewed, and specific solutions to prevent and to reject the induced background are presented.

Abstract ID. 200 - 2

Title	The windowless gaseous tritium source of KATRIN
Author	Sebastian Fischer (Karlsruhe Institute of Technology)
Co-authors	The KATRIN collaboration

The aim of the Karlsruhe Tritium Neutrino experiment (KATRIN) is the direct measurement of the neutrino mass by the precise investigation of the kinematic endpoint region of tritium β-decay. A 30 K cold windowless gaseous tritium source (WGTS) generates 10^{11} electrons/s that are guided to the spectrometer for energy analysis. To reach the design sensitivity of 200 meV/c^2 (90% C.L.), the key parameters of the WGTS have to be stabilized to 0.1% and accordingly monitored. Models of the gas dynamics and the WGTS instrumentation were developed in the last years and sub-systems have been successfully tested under realistic conditions. An overview of the WGTS and its status will be given. The interplay between the individual monitoring systems and its benefit for KATRIN will be highlighted.

Abstract ID. 201 - 3

Title	Wavelength-Shifting Plate Light Collectors
Author	William Johnston (Colorado State University)
Co-authors	Norm Buchanan

The Long-Baseline Neutrino Experiment (LBNE) is a proposed long baseline neutrino experiment designed to measure the neutrino mixing angles δ_{cp}, θ_{13}, proton decay, and the neutrino mass hierarchy. Three light collector designs have been investigated for the proposed 200 kton water Cerenkov far detector. One design, based on flat plates of wavelength shifting plastic, has been studied at Colorado State University. Several prototypes were fabricated and tested in water under uniform illumination as well as by scanning a 1mm diameter light source across the face of the plates. Geant4 simulations have been used to study the design parameters of the plate. These parameters were varied in simulation in order to study their effect on the overall light level, timing, and shape of the detected Cerenkov rings.

Abstract ID. 202 - 1

Title	Development of scintillating fiber tracker with MPPC for next-generation neutrino detector
Author	Tokio Nagasaki
Co-authors	A.K.Ichikawa,M.Ikeda,T.Kikawa,A.Minamino,T.Nakaya,M.Yokoyama

In the T2K experiment, it is possible to upgrade near detectors. For the upgrade, we have a plan to install a detector with scintillating fiber. This dececter is installed as a target of neutrino and a tracker. This tracker improves position resolution from the current value,1 cm, to 1 - 2 mm. This improvement makes it possible to improve measurement sensitivity of low energy neutrino interaction. Culrrently we are designing a small scintillating fiber tracker which is a cube about 10 cm, on a side. We will install it at J-PARC to measure the cross sections of pion absorption and charge exchange (CX) for pion momentum above 400 MeV/ c. The result will reduce uncertainty of interaction, in nucleus, of charged pion from neutrino interaction from 10% to 5%. Therefore we will be able to redeuce one of the largest systematic errors containing above pion interaction. In this poster, R&D status of the small scintillating fiber tracker will be presented.

Abstract ID. 203 - 2

Title	Status of the DCBA experiment for neutrinoless double beta decay search
Author	Hiroshi Iwase (KEK)
Co-authors	N.Ishihara, T.Ohama, H. Kakuno, T. Sumiyoshi, Y. Kato, K.Takahashi, M.Kawai, et al

Neutrinoless double beta ($0\nu\beta\beta$) decay takes place when neutrinos have Majorana nature, which is essential in See-saw mechanism and Leptogenesis. Since the half-life is expected to be very long as 10^{25} - 10^{26} y, the experiment of $0\nu\beta\beta$ decay requires to eliminate background events efficiently, have a good energy resolution to distinguish $0\nu\beta\beta$ decay from two-neutrino double beta ($2\nu\beta\beta$) decay, and accommodate a lot of decay source. A magnetic tracking detector called Drift Chamber Beta-ray Analyzer (DCBA) is being developed to search for $0\nu\beta\beta$ decay at KEK. A prototype called DCBA-T2 has been constructed and operated. The obtained energy resolution is about 150 keV (FWHM) at 980 keV. The source is a thin plate of natural Mo. So far we have obtained several ten event candidates of $2\nu\beta\beta$ decay from Mo-100, natural abundance 9.6

Abstract ID. 204 - 3

Title	Status of the BAIKAL-GVD project
Author	Bair Shaybonov (Joint Institute for Nuclear Research)
Co-authors	A. V. Avrorin et. al.

The construction of a km3-scale neutrino telescope - the Gigaton Volume Detector (GVD) in Lake Baikal - is the central goal of the Baikal collaboration. During the R&D phase of the GVD project in 2008-2010 years the basic elements of GVD - new optical modules, FADC readout units, underwater communications and trigger systems - have been developed, produced and tested in-situ by long-term operating prototype strings in Lake Baikal. The prototyping phase of the GVD project has been started in April 2011 with the installation of a three string array. This array was upgraded with full-scale GVD string in April 2012.

Abstract ID. 205 - 1

Title	Measurement of an Effective Quasi-Elastic Axial Mass Parameter in MINOS
Author	Nicholas Graf (Illinois Institute of Technology)
Co-authors	Nathan Mayer

The MINOS experiment has the worlds best data set of neutrino interactions on iron in the 1-10 GeV range. Our iron target allows us to explore the effect that a high Z target has on the basic neutrino-nucleon interaction. We expect to have final results from a low hadronic energy, quasi-elastic enhanced sample of neutrino-iron interactions observed by the MINOS Near Detector in the NuMI neutrino beam at Fermilab by Fall 2012. Our analysis uses a shape fit to the Q^2 distribution for these events to extract a value for the effective axial-vector mass M_A^{QE} which best describes that distribution.

Abstract ID. 206 - 2

Title	An updated search for electron neutrino and antineutrino appearance in MINOS
Author	Ruth Toner (Harvard University)
Co-authors	Adam Schreckenberger (University of Minnesota)

MINOS is a long-baseline neutrino oscillation experiment capable of searching for muon neutrino to electron neutrino transitions, observation of which would indicate a nonzero value for the neutrino mixing angle θ_{13}. A new study will analyze an additional 3.3×10^{20} protons-on-target of mostly antineutrino data to look for the oscillation of muon antineutrinos to electron antineutrinos. A planned joint fit will also combine these antineutrino results with the full set of MINOS neutrino data, for the most sensitive MINOS measurement of θ_{13} to date. The latest results for this analysis will be presented.

Abstract ID. 207 - 3

Title	The KM3NeT photonic readout and data acquisition system
Author	Paul Kooijman (Univeristy of Amsterdam/Nikhef)
Co-authors	Els de Wolf

A novel optical network has been designed for data transfer and communication for distances up to 100 kilometers. The implementation relies on sensor technologies using a FPGA and photonic components and a 10 Gb/s resistant optical network for readout, data acquisition and communication. Much functionality has been migrated to shore, allowing for easy access to the system during the long lifetime of the telescope. Timing calibration is an integral part of the network architecture providing an event timing resolution better than 1 ns. Although developed for use in the deep-sea, the concept of the system can be used in other experiments. We will present the design and test results of the data acquisition system and the network architecture.

Abstract ID. 208 - 1

Title	A background measurement campaign for very large scale water and scintillator detectors
Author	Adam Bernstein (Lawrence Livermore National Laboratory)
Co-authors	

Muogenic neutron and radionuclide rates are poorly understood at medium to deep overburden, but play an important role in the design of future large (100 kiloton and above) detectors for a range of neutrino physics goals, as well as in determining the feasibility of the - for now distant - prospect of remote detection of small reactors. I will describe a newly begun campaign in the United States to carefully measure these backgrounds at depths ranging from 100 to 1000 meters water equivalent.Data from the campaign will be used to inform the designs of future medium depth applied and fundamental neutrino physics experiments.

Abstract ID. 209 - 2

Title	The Hyper-Kamiokande Project: Sensitivity of neutrino CP violation research
Author	Kunxian Huang (Kyoto University)
Co-authors	The Hyper-Kamiokande working group

The Hyper-Kamiokande (Hyper-K) Project is proposed as a next generation of the water Cerenkov detector which could serves as a far detector of the J-PARC neutrino oscillation experiment. In 2011 T2K results gave the hint of nonzero value of θ_{13} giving a chance to observe the CP violation angle (δ) of neutrino oscillation with high statistics detector in future. In the Hyper-K simulation, present T2K and Super-K methods are used to establish reconstructed event numbers. In this poster, sensitivity of θ_{13} verse δ will be discussed and I will also emphasize on octant of θ_{23} and earth density uncertainty affecting for sensitivity.

Abstract ID. 210 - 3

Title	Studying Neutrino Directionality with Double Chooz
Author	Erica Caden (Drexel University)
Co-authors	

The first results from Double Chooz with 100 days of data measured $\sin^2(2\theta_{13}) = 0.086 \pm 0.051$. Backgrounds contribute significantly to the systematic uncertainty budget. Using the incoming neutrino directionality we will attempt to further separate the inverse beta decay signal from backgrounds. The CHOOZ experiment completed a similar analysis and found that the neutrino source can be located to within a cone of half-aperture of 18 degrees at the 68% C.L. We'll study the possible improvement of this results by Double Chooz.

Abstract ID. 211 - 1

Title	A comparison between Rhenium and Holmium as sources for the measure of the neutrino mass.
Author	Renzo Vaccarone (INFN)
Co-authors	

I compare the efficiency of two systems which are proposed for the direct calorimetric measurement of the neutrino mass. The measurements are made with large sets of sensors, composed by a radioactive source and a TES (Transition Edge Sensor). I study sources based on the Beta decay (in 187Re) and the electron capture (in 163Ho), but read with similar sensors. In both cases the measure is spoiled by the pile-up of events, and one has to build and calibrate a large number of detectors to a stringent precision. The detectors should measure with high resolution and a fast response time. The main parameter which determine the size and the number of detectors and the time needed to reach the objective are the speed and the resolution of each sensor and the uniformity of the set of sensors.

Abstract ID. 212 - 2

Title	Status of geochemical determination of the solar pp-neutrino flux by LOREX
Author	Zelimir Djurcic (Argonne National Laboratory)
Co-authors	LOREX Collaboration

LOREX experiment will determine the long-time average of the solar neutrino flux using the ^{205}Tl contained in lorandite mineral ($TlAsS_2$) via the neutrino-capture reaction $^{205}Tl + \nu_e \rightarrow ^{205} Pb + e^-$. Unknown capture probability of solar pp-neutrinos can be measured based of the life-time for the BBD of the completely ionized ^{205}Tl. The final step of LOREX will be determination of the ratio of ^{205}Pb/^{205}Tl atoms to provide the product of solar neutrino flux and neutrino-capture cross section integrated over the geological age 4.31 My.

Abstract ID. 213 - 3

Title	Status of the MARE experiment
Author	Flavio Gatti (University and INFN of Genoa)
Co-authors	The MARE Collaboration

MARE (Microcalorimeter Array for a Rhenium Experiment) is an experiment designed to measure the mass of the electron neutrino using cryogenic microcalorimeters. The current focus is on the development of a prototype detector to demonstrate the feasibility of the full scale experiment, drive its design, and determine its final performance. In this paper we will discuss the requirements to achieve a sensitivity for the neutrino mass of 0.1-0.2 eV/c^2 and finally review the current progress of the experiment.

Abstract ID. 214 - 1

Title	Atmospheric Neutrinos and Future Large Liquid Argon Detectors
Author	Hugh Gallagher (Tufts University)
Co-authors	Andy Blake, Roxanne Guenette

Future large long-baseline experiments will be able to utilize atmospheric neutrinos to extend their investigations of three-flavor mixing, in particular for the determination of the mass hierarchy, the determination of the octant of theta-23, and the exploration of exotic scenarios. Liquid argon detectors, with the ability to image sub-relativistic particles and excellent topological determination over the atmospheric neutrino energy range, would provide new opportunities in this area. In this poster we will present estimates of the capability of a future liquid argon detector for the LBNE experiment for the measurement of oscillations in the atmospheric neutrino flux, with an emphasis on the determination of the mass hierarchy.

Abstract ID. 215 - 2

Title	Precision Measurement of Solar Neutrino Flux with the Borexino Detector
Author	Szymon Manecki (VirginiaTech)
Co-authors	The Borexino Collaboration

Neutrino interaction results have provided a direct link to the sun's interior and have contributed to the understanding of not only the burning of our star, but have predominantly revealed some of the biggest mysteries of neutrino behavior and their properties. The Borexino experiment began its search for the lowest energetically, monochromatic line of ^{7}Be neutrinos in 2007, and with only 740 live-days, the collaboration was able to achieve the remarkably precise measurement level of 5%.

Abstract ID. 216 - 3

Title	Probing the baryon asymmetry of the universe by experimental searches of sterile neutrinos
Author	Shintaro Eijima (Niigata University)
Co-authors	Takehiko Asaka, Hiroyuki Ishida

We discuss a model is the Standard Model extended by two right-handed neutrinos with Majorana masses below the electroweak scale. In this model, the tiny neutrino masses and the baryon asymmetry of the universe (BAU) can be explained. Furthermore the sterile neutrinos, heavier mass eigenstates of neutrinos, are testable in some experiments. Then, we study to probe the origin of BAU with searching for sterile neutrinos. Concretely we derived the parameter region allowed to constraints from experimental results and Big Bang Nucleosynthesis, and evaluated the amount of baryon asymmetry in the region.

Abstract ID. 217 - 1

Title	Coherence and neutrino oscillation experiments
Author	Daniel Hernandez (ICTP)
Co-authors	E. Akhmedov, A. Yu. Smirnov

Neutrino production coherence is considered in detail. We take the pion decay as setup and calculate the oscillation probabilities, obtained in two different ways. A coherent summation of the amplitudes of neutrino production at different points along the trajectory of the parent pion is compared with the averaging of the standard oscillation probability over the neutrino production coordinate in the source. We demonstrate that the results of these two different approaches exactly coincide, provided that the parent pion is considered as pointlike and the detection process is perfectly localized. We analyze the reason for this equivalence of the two approaches and demonstrate that for pion wave packets of finite width the equivalence is broken.

Abstract ID. 218 - 2

Title	Dynamics of Paired Superradiance: Toward Atomic Neutrino Spectroscopy
Author	Minoru Tanaka (Osaka University)
Co-authors	M. Yoshimura and N. Sasao

Neutrino pair emission accompanied by a photon from atoms/molecules, $|e\rangle \to |g\rangle + \gamma + \nu + \bar{\nu}$ where $|e\rangle$ and $|g\rangle$ denote atomic/molecular states, makes neutrino spectroscopy possible. But, it requires an enhancement of the rate by macroscopic coherence developed in the target. The viability of the macro-coherence may be examined in the process with the neutrino pair being replaced by another photon, $|e\rangle \to |g\rangle + \gamma + \gamma$, that is, paired superradiance (PSR). In this poster, the theoretical background and the dynamics of PSR including numerical results are presented.

Abstract ID. 219 - 3

Title	Toward Construction of the Unified Lepton-Nucleus Interaction Model from a Few Hundred of MeV to GeV Region
Author	Hiroyuki Kamano (Research Center for Nuclear Physics, Osaka University)
Co-authors	Yoshinari Hayato, Masanori Hirai, Shunzo Kumano, Satoshi Nakamura, Makoto Sakuda, Koichi Saito, Toru Sato

An accurate understanding of the neutrino nucleus reactions is of great importance owing to the increasing precision of the neutrino oscillation experiments. The purpose of our study is to develop a reaction model for the lepton nucleus reaction from a few hundred MeV to a few GeV. We report on our analysis of the lepton nucleus reaction with the updated resonance model and the nuclear PDF in the DIS region.

Abstract ID. 220 - 1

Title	Nuclear medium effects in extracting $sin^2\theta_W$ using Paschos-Wolfenstein relation
Author	H. Haider (Department of Physics, Aligarh Muslim University, Aligarh, India)
Co-authors	I. Ruiz Simo and M. Sajjad Athar

We discuss the effect of nuclear medium in obtaining the weak mixing angle $sin^2\theta_W$ using Paschos-Wolfenstein relation. Neutrino and antineutrino induced charged and neutral current reactions on various targets like ^{12}C, ^{56}Fe and ^{208}Pb have been studied. The nuclear medium effects in the structure functions $F_{2,3}^A(x, Q^2)$ are studied by taking into account Fermi motion, binding, shadowing and antishadowing corrections and pion and rho meson cloud contribution. The results may be useful in the analysis of MINERνA experiment.

Abstract ID. 221 - 2

Title	Spin light of neutrino in plasma
Author	Alexey Lokhov (Moscow State University)
Co-authors	A.V. Grigoriev, A.I. Studenikin, A.I. Ternov

We present the further development of the theory of spin-light of neutrino ($SL\nu$) - a new mechanism of electromagnetic radiation produced by neutrino in dense matter or external fields. We particularly consider the propagation of neutrino in dense cold plasma. The method of exact solutions of the modified Dirac equation is exploited. We derive the spectrum of the emitted plasmon and the differential probability and intensity of radiation as well as the total rate and power of the considered process. These values are estimated for a set of parameters that could describe possible astrophysical situations (neutron stars etc.).

Abstract ID. 222 - 3

Title	Hierarchically Acting Sterile Neutrinos
Author	Chian-Shu Chen (National Center for Theoretical Sciences, Taiwan)
Co-authors	Ryo Takahashi

We propose that a hierarchical spectrum of sterile neutrinos (eV, keV, 10^{13-15} GeV) is considered to as the explanations for MiniBooNE and LSND oscillation anomalies, dark matter, and baryon asymmetry of the universe (BAU) respectively. The scenario can also realize the smallness of active neutrino masses by seesaw mechanism.

Abstract ID. 223 - 1

Title	Lepton flavour violation in the supersymmetric inverse seesaw
Author	Cedric Weiland (LPT Orsay, Univ. Paris-Sud 11/CNRS)
Co-authors	Asmaa Abada, Debottam Das, Avelino Vicente, Cedric Weiland

Embedding the inverse seesaw in a supersymmetric framework (MSSM), we have highlighted in a previous work that the Higgs-mediated contributions to lepton flavour violating (LFV) observables are enhanced by as much as two orders of magnitude. As recently pointed out, the Z-mediated contributions could also be enhanced in extensions of the MSSM accommodating neutrino masses like the supersymmetric inverse seesaw. This work, being a comprehensive study of several LFV observables and their enhancements due to the effect of the inverse seesaw, allows us to put new constraints on this model and its specific behaviour.

Abstract ID. 224 - 2

Title	Neutrino Mass Matrix Composed of M_e and M_u Only
Author	Yoshio Koide (Osaka University)
Co-authors	Hiroyuki Nishiura

Within the framework of the yukawaon model (a kind of flavon model), we found that a neutrino mass matrix with a simple form can gives resonable neutrino mass spectrum and mixing. The form is given by $M_\nu \simeq k_\nu (M_e^{-1} M_u^{1/2} + M_u^{1/2} M_e^{-1})^{-1}$, where M_e and M_u are charged lepton and up-quark mass matrices, respectively, and they are described only by parameters a_e (real) and a_u (complex), respectively. It should be noted that the neutrino mass matrix M_u itself does not have any adjustable parameter except for the parameters in M_e and M_u. In spite of its few parameter model, by using the observed values of charged lepton mass ratios, up-quark mass ratios and $\tan^2\theta_{solar} = 0.47$ as the input values, the model can give predictions $\sin^2 2\theta_{atm} = 0.99$, $\sin^2 2\theta_{13} \simeq 0.015$, $\Delta m^2_{21}/\Delta m^2_{32} \simeq 0.030$, $\langle m_{ee} \rangle \simeq 0.0039$, and so on.

Abstract ID. 225 - 3

Title	Neutrino flavor oscillations in matter moving with acceleration
Author	Ilya Tokarev (Moscow State University, Physics Department)
Co-authors	P. Kirichenko, A. Studenikin, I. Tokarev

Neutrino flavor oscillations in matter moving with acceleration are considered. We develop an approach that is valid for both nonrelativistic and relativistic matter motion. For both these cases the effective neutrino potentials in accelerating matter are obtained and neutrino flavor oscillation probabilities are evaluated. The obtained results in the limit of zero matter acceleration reproduce the corresponding expressions for the case of matter at rest. The developed approach is applied for neutrino flavor oscillations in the case of rotating matter. The results obtained might be of interest for astrophysical applications.

Abstract ID. 226 - 1

Title	Electromagnetic properties of neutrino: a window to new physics
Author	Alexander Studenikin (Moscow State University & JINR-Dubna)
Co-authors	Ilya Balantsev, Carlo Giunti

A review on neutrino electromagnetic properties, including magnetic moments, is presented. Neutrino electromagnetic interactions in presence of strong electromagnetic fields and dense matter are also discussed. Neutrino motion in strong magnetic fields and dense media are treated within the method of exact solutions of quantum equations for neutrino wave function accounting for external potentials. New results obtained, in particular neutrino energy quantization in rotating matter, are of interest for applications in astrophysics and cosmology.

1. C.Giunti, A.Studenikin, "Electromagnetic properties of neutrino", Phys.Atom.Nucl. 73 (2009) 2089-2125, arXiv:0812.3646 v5, 12 Apr 2010.

2. I.Balantsev, Yu.Popov, A.Studenikin, "On the problem of relativistic particle motion in strong magnetic field and dense matter", J.Phys.A:Math.Theor. 44 (2011) 255301 (12pp).

Abstract ID. 227 - 2

Title	Experiment on detection of coherent neutrino scattering off atomic nuclei
Author	Dmitri Akimov (Institute of Theoretical and Experimental Physics)
Co-authors	RED collaboration

We propose a new experiment RED (Russian Emission Detector) to detect neutrino-nucleus neutral current scattering with two-phase noble liquid detector. For experiment based on nuclear power plant reactor the expected nuclear recoil signal is in the 1 keV range where responses of liquid Xe and liquid Ar are not known. The expected signals and backgrounds are presented for the high and low assumptions on the nuclear recoil specific ionisation yield in the liquid noble gas and for two detector options: with liquid Xe and liquid Ar. A detector design of RED-100 experiment (100 kg of LXe) is presented.

Abstract ID. 228 - 3

Title	Constraining New Physics with Neutrino-Electron Scattering
Author	Muhammed Deniz (Dokuz Eylul University, Turkey)
Co-authors	Henry T. Wong, Selcuk Bilmis

$\nu - e^-$ scatterings are purely leptonic processes with robust standard model (SM) predictions. Their measurements can therefore provide constraints to physics beyond SM. $\bar{\nu}_e$ scattering off e^- data taken at the Kuo-Sheng Reactor Neutrino Laboratory were used to probe few new physics scenarios. New constraints were placed on Non-Standard Interaction of Neutrino (NSI) parameters for the non-universal and flavor-changing channels, as well as to the coupling constants for scalar and vector unparticles to the neutrinos and electrons. Bounds were also derived on the scale parameter for Non-Commutative Physics using neutrino electron scattering data with reactor and accelerator neutrinos.

Abstract ID. 229 - 1

Title	Non-thermal Leptogenesis in Quasi-degenerate Neutrinos
Author	Ngouniba. Ki . Francis (Gauhati University)
Co-authors	N.Nimai Singh

We study the Quasi-degenerate neutrinos (QDN) which predicts the current data of neutrinos and baryogenesis. Majorana CPV phases are considered to estimate the BAU. QDN matrix obeying $\mu - \tau$ symmetry predicts the results consistent with ν data. We consider the charged lepton and up quark mass matrices as diagonal form of Dirac matrix (m_{LR}), and related M_{RR} through Type-I seesaw. Non-thermal leptogenesis shows that Type-IA in QD-NH for charged lepton type of m_{RL} is the only model consistent with BAU. The predicted inflaton mass needed to produce the observed BAU is found to be $M_\phi \sim 10^{10}$ GeV for $T_R = 10^6$ GeV; these data agreed with chaotic or natural theories. QD-NH is more favourable than QD-IH. These results give a new direction to the future experiments.

Abstract ID. 230 - 2

Title	Testing the Validity of an Antineutrino Anomaly with High Precision Beta Spectra
Author	Gregory Keefer (Lawrence Livermore National Lab)
Co-authors	N. Bowden and T. Classen

We describe an effort at LLNL, aimed to produce a well-validated and public code base for the nuclear physics community to predict beta spectra — something that is absent from widely used codes like Geant4. High precision, validated, beta spectra are a critical input to the flux predictions upon which the interpretation of single reactor antineutrino experiments rely. We present an overview of the status of our current work and describe the differences in our work from Huber and Mueller, *et al.*, indicating the implications it has on the predicted reactor fission beta spectrum.

Abstract ID. 231 - 3

Title	TeV-Scale Seesaw with Loop-Induced Dirac Mass Term and Dark Matter from $U(1)_{B-L}$ Gauge Symmetry Breaking.
Author	Takehiro Nabeshima (University of Toyama)
Co-authors	Shinya Kanemura, Hiroaki Sugiyama

I would like to discuss about the TeV-scale seesaw model in which $U(1)_{B-L}$ gauge symmetry can be the common origin of neutrino masses, the dark matter mass, and stability of the dark matter. In our model, Majorana masses of right handed neutrinos and Dirac mass of dark matter are induced by spontaneous $U(1)_{B-L}$ breaking. After electroweak symmetry breaking, light neutrino masses are generated at a two-loop level. In this poster, first, I would like to introduce our model. Next, I would like to mention about the current experimental constraints and prospects at collider experiments in our model.

Abstract ID. 232 - 1

Title	Dark matter and a suppression mechanism for neutrino masses in the Higgs triplet model
Author	Hiroaki Sugiyama (Ritsumeikan Univ.)
Co-authors	Shinya Kanemura

We extend the Higgs triplet model so as to include dark matter candidates and a simple suppression mechanism for the vacuum expectation value (v_Δ), which gives neutrino masses, of the triplet scalar field. The Higgs sector is extended by introducing Z_2-odd scalars in addition to a Z_2-even complex singlet scalar whose vacuum expectation value violates the lepton number conservation by a unit. In our model, v_Δ is generated by the one-loop diagram to which Z_2-odd particles contribute. The lightest Z_2-odd scalar boson can be a candidate for the dark matter. We briefly discuss a characteristic signal of our model at the LHC.

Abstract ID. 233 - 2

Title	Multi-component Dark Matter in Supersymmetric Radiative Seesaw Model
Author	Hiroshi Takano (Kanazawa University)
Co-authors	Mayumi Aoki, Jisuke Kubo, Taishi Okawa

We consider a recently proposed supersymmetric radiative seesaw model which is coupled with the minimal supergravity. The conventional R parity and Z_2 invariance are imposed, which ensures the existence of a multi-component dark matter system. We assume that the pair of the lightest neutralino $\tilde{\chi}$ and the fermionic component $\tilde{\xi}$ of the inert Higgs supermultiplet is dark matter. If $\tilde{\xi}$ is lighter than $\tilde{\chi}$, and the lightest neutral inert Higgs boson is kinematically forbidden to decay (third dark matter), the allowed region in the m_0-$M_{1/2}$ plane increases considerably, where m_0 and $M_{1/2}$ are the universal soft-supersymmetry-breaking scalar and gaugino mass, respectively, although the dominant component of the multi-component dark matter system is $\tilde{\chi}$. There is a wide allowed region above the recent LHC limit. This work is based on Phys. Lett. B 707 (2012) 107.

Abstract ID. 234 - 3

Title	Coannihilation and Direct Detection of Leptophilic Dark Matter in a Radiative Neutrino Mass Model
Author	Takashi Toma (Kanazawa University)
Co-authors	Daniel Schmidt, Thomas Schwetz

We consider a radiative neutrino mass model proposed by Ma. The particles which propagate in the loop can be DM candidates, being leptophilic by construction. We consider the situation that the lightest right handed neutrino is the DM candidate and the second lightest right handed neutrino is almost degenerated with the DM candidate. Under this situation, coannihilation processes play an important role in order to satisfy the experimental constraints. Moreover, inelastic scattering induced by a lepton-loop coupled to the photon gives the dominant contribution to the event rate in direct detection experiments.

Abstract ID. 236 - 2

Title	Constraining double beta decay matrix elements with transfer reactions in a solid Xe target
Author	Ke Han (Lawrence Berkeley National Laboratory)
Co-authors	T. Bloxham, J. A. Clark, C. M. Deibel, S. J. Freedman, S. J. Freeman, A. M. Howard, B. P. Kay, S. A. McAllister, A. J. Mitchel, P. D. Parker, J. P. Schiffer, D. K. Sharp, and J. S. Thomas

Effective Majorana mass depends on neutrinoless double beta decay (NDBD) half-life as well as the nuclear matrix elements (NME). Nucleon transfer reactions can map out the valence neutron and proton orbital occupancies in the parent and daughter nuclei and provide new benchmarks for NME calculations. Recently we built a cryogenic solid Xe target and ran successfully for Xe-130, which is the daughter of Te-130 NDBD. The cryogenic target was demonstrated to have excellent uniformity, thickness control, and radiation hardness. The same target will be used for transfer reactions of Xe-136, another NDBD candidate isotope. Our new results for the Te-130/Xe-130 orbital occupancies and future work on Xe-136/Ba-136 will provide additional constraint to NME calculations for Te-130 and Xe-136.

Abstract ID. 237 - 3

Title	TeV-scale Seesaw Model with Fermion Quintuplets
Author	Ivica Picek (Dept. of Physics, Univ. of Zagreb, Croatia)
Co-authors	Krešimir Kumerički and Branimir Radovčić

We propose TeV-scale fermionic quintuplets which in conjunction with scalar quadruplet produce Majorana masses of the known neutrinos via dim 9 tree-level seesaw operator and radiative loop-suppressed contributions. We identify the range of the model parameter space with exotic fermions of a few 100 GeV, where the proposed mechanism is testable at the LHC via multilepton events in decays of doubly-charged, Drell-Yan produced heavy leptons. In the regime of radiatively generated neutrino masses the neutral components of fermion quintuplets could play a role of dark matter.

Abstract ID. 238 - 1

Title	The development of the method for investigating astronomical body soils by neutrino spectroscopy
Author	Victor Trapeznikov (Physicotechnical Institute of the Ural Division of the Russian Academy of Sciences)
Co-authors	I.N. Shabanova

The objective of the present paper is the application of the dense neutrino flux arising due to diffraction for investigating astronomical body soils by the neutrino spectroscopy method at the interaction of neutrinos with soil substance and the formation of studied electrons. In the present paper it is offered to obtain the information about the soil of a cosmic object by investigating the absorption spectrum of neutrinos coming from the object in two ways, i.e. by the registration of the electrons of excited neutrinos from a source placed on a space station circumrotating around an astronomical body, and by using a natural neutrino flux going through a cosmic object by a receiving station on the Earth. Such station is composed of bent crystals of diffractometers made in accordance with the inverse scheme of Johannes method similar to those used for the diffraction of neutrino radiation from nuclear reactors situated on the Earth.

Abstract ID. 239 - 2

Title	New physics search at near detectors of future neutrino experiments
Author	Toshihiko Ota (Max-Planck-Institut fuer Physik)
Co-authors	Stefan Antusch, Mattias Blennow, Enrique Fernandez-Martinez, Shinya Kanemura, Yoshitaka Kuno, Toshihiko Ota

We study the prospects of searching for New physics — Lepton flavour/number violating interactions — at a near detector in future neutrino facilities. We discuss which effective operators can lead to new physics effects and discuss the present bounds on such operators set by other experimental data currently available. We highlight to which kind of new physics a tau sensitive near detector would be most sensitive. This poster presentation is based on the paper JHEP **1006** (2010) 068 (Antusch et al.) and a work in progress.

Abstract ID. 240 - 3

Title	Is there an 'LSND anomaly'?
Author	Dmitry Dedovich (Joint Institute for Nuclear Reasearch)
Co-authors	HARP-CDP group

The 'LSND anomaly' is a 3.8 σ excess of electron antineutrinos found in the LSND beam dump experiment at Los Alamos, and interpreted as evidence for a $\bar{\nu}_e \rightarrow \bar{\nu}_\mu$oscillation with Δm^2 in the range $0.1 - 2eV^2$. This claim is in stark conflict with the widely accepted Standard Model of oscillations between three light neutrino species, and requires at least one 'sterile' neutrino. Tests by the MiniBooNe Collaboration did not clarify the situation. For the first time, it is argued that the 'LSND anomaly' is not a genuine physics phenomenon but is likely to arise from shortcomings in the analysis of the LSND data. The HARP-CDP group shows that backgrounds were underestimated and systematic errors were ignored. The overall conclusion is that the significance of the 'LSND anomaly' is not larger than 2.3 σ.

Abstract ID. 241 - 1

Title	Getting the best out of T2K and NOvA
Author	Sushant Raut (Indian Institute of Technology Bombay)
Co-authors	Suprabh Prakash, S. Uma Sankar

We explore the combined physics potential of T2K and NOvA in light of the large measured value of θ_{13}. For the measured values of θ_{13}, the hierarchy can be determined at 90 % C.L. only for the combinations (NH, $\delta_{CP} \in (-\pi, 0)$) and (IH, $\delta_{CP} \in (0, \pi)$), with the currently planned runs of NOvA and T2K. However, the hierarchy can essentially be determined for any value of δ_{CP}, if the statistics of NOvA are increased by 50% and those of T2K are doubled. This moderate increase in statistics will also determine the correct half plane of δ_{CP}. We demonstrate that any measurement of δ_{CP} is not possible without first determining the hierarchy. We find that comparable data from a shorter baseline (L $\sim$ 130 km) experiment will not lead to any significant improvement.

Abstract ID. 242 - 2

Title	Application of the Feldman-Cousins Method to the Combination of Datasets from Multiple Experiments
Author	Martin David Haigh (University of Oxford, UK)
Co-authors	A. V. Waldron, A. Weber

The precision with which physics parameters can be determined can often be improved by combining the results from multiple experiments. This is particularly true in the neutrino sector, where there is overlap in the physics capabilities of different projects, and combinations may help, for example, to resolve degeneracies between CP-violation and matter effects in the next generation of experiments. We present a method to combine results by using the Feldman-Cousins technique on a dataset comprising the measurements of several experiments. Such a method allows for correct coverage, and to include correlated systematic errors. As an example, we present a combination of the recent ν_e results from the T2K and MINOS experiments. We also describe the data required to enable inclusion in a combination by our method, and propose that collaborations consider routinely publishing this data in future.

Abstract ID. 243 - 3

Title	Neutrino Diffraction I
Author	Kenzo ISHIKAWA (Hokkaido University)
Co-authors	Yutaka Tobita

Neutrino reveals unique interference phenomena due to its tiny mass. The neutrino property is found from its reaction process, and the position dependent probability of detecting the neutrino in the pion decay shows an unusual diffraction pattern of unique natures. Its features, physical origins, derivation, and implications are presented in our poster I and II. In I,its physical origins and intriguing properties are presented.

Abstract ID. 244 - 1

Title	Neutrino Diffraction II
Author	Yutaka TOBITA (Hokkaido University)
Co-authors	Kenzo ISHIKAWA

A series of works on interference phenomena of neutrino waves is presented. In this II, the detailed derivation and implications of the neutrino diffraction are presented. 1. The LSND anomaly is understood with the neutrino diffraction. The helicity suppression is relaxed for the diffraction term and the electron mode is enhanced and becomes much larger than nomal mode. 2. A flux of the neutrino from the pion decay is modified by the diffraction. Then the νN total cross section is also modified and has a small energy dependence. This small dependence agrees the data of experiments. 3. The electron neutrino appearance at the near detector region is studied. Then, a possibility of measurement of absolute neutrino mass by using near detector is disscussed.

Abstract ID. 245 - 2

Title	The latest Borexino impact on the global analysis of neutrino data
Author	Alessandra Carlotta Re (INFN Milano)
Co-authors	The Borexino collaboration

I present a phenomenological analysis of neutrino data within the standard scenario of three non-sterile and mixed neutrinos. The impact of each piece of information coming from the Borexino experiment is analyzed. The outcome of the Borexino-only analysis is then combined with the results obtained by other solar experiments: it is shown that, thanks to the Borexino inclusion, the LOW region of MSW regime is strongly disfavored by solar neutrino data alone. The LMA solution is singled out with very high confidence without the inclusion of any anti-neutrino data that is without invoking CPT symmetry. The KamLAND and the T2K, DAYA BAY and RENO contributions are finally added to the global analysis and the best-fit are reported.

Abstract ID. 246 - 3

Title	Atmospheric Sterile Neutrinos
Author	Atsushi Watanabe (Max-Planck-Institut fuer Kernphysik)
Co-authors	Takehiko Asaka

We study production of the sterile neutrinos in the atmosphere and their detection at Super–Kamiokande (SK). A sterile neutrino with the mass of $1 - 105\,\mathrm{MeV}$ is produced by $\mu^{\pm}$ or $\pi^{\pm}$ decay, and decays to an $e^{\pm}$ pair and an active neutrino, leaving $2e$-like Cherenkov rings in the detector. The upper bound of the active–sterile mixing placed by SK is shown in comparison with other types of experiments, such as the meson peak searches and the decay search by PS191. We also demonstrate that the opening angle and the total energy of the rings may serve as diagnostic tools to discover the sterile neutrinos. The directional asymmetry of the events is a sensitive measure of the diminishment of the sterile neutrino flux due to the decays on the way to the detector.

Abstract ID. 247 - 1

Title	Stronger limits for the Violation of Equivalence Principle from atmospheric neutrino data
Author	G. A. Valdiviesso (Federal University of Alfenas)
Co-authors	D. R. Gratieri, M. M. Guzzo, P. C. Holanda, O. L. G. Peres

We re-examine the limts for the Violation of Equivalence Principle (VEP) using updated observations from solar and reactor neutrino experiments and for the first time including the atmospheric neurino data. The VEP phenomena can induce muon to electron neutrino oscillations and distort the neutrino zenith distribution. Due to their higher energy, the inclusion of atmospheric neutrinos in the full analysis imposes significantly stronger constraints on the relevant VEP parameters, on all neutrino sectors.

Abstract ID. 248 - 2

Title	An alternative parametrization for neutrino mixing
Author	Shao-Hsuan Chiu (Physics Group, Chang Gung University)
Co-authors	C. C. Huang and T. K. Kuo

The neutrino mixing matrix is examined through a set of rephrasing invariant parametrization. The parameters are shown to obey evolution equations as functions of the induced mass in matter. These equations are found to preserve some characteristic features of the matrix, and facilitate both the experimental and the theoretical analyses of the neutrino properties. In addition, applications to the renormalization group (RG) running of the neutrino mass and mixing will be explored

Abstract ID. 249 - 3

Title	Predicting Theta-13 in June 2012
Author	Pedro A. N. Machado (Universidade de São Paulo and IPhT, CEA-Saclay)
Co-authors	H. Minakata, H. Nunokawa, R. Zukanovich Funchal

The lepton mixing angle θ_{13}, the only unknown angle in the standard three-flavor neutrino mixing scheme, is finally measured by the recent reactor and accelerator neutrino experiments. We perform a combined analysis of the data coming from T2K, MINOS, Double Chooz, Daya Bay and RENO experiments and find $\sin^2 2\theta_{13} = 0.096 \pm 0.013(\pm 0.040)$ at 1 σ (3 σ) CL and that the hypothesis $\theta_{13} = 0$ is now rejected at a significance level higher than 7 σ. We also discuss the near future expectation on the precision of the θ_{13} determination by using expected data from these ongoing experiments.

Abstract ID. 250 - 1

Title	Δm^2_{13} Measurement using Reactor Complementary Study
Author	Thiago Junqueira de Castro Bezerra (Tohoku University)
Co-authors	Fumihiko Suekane

Presently, the experiments to measure the last unknown neutrino oscillation mixing angle, θ_{13}, are: the Double Chooz in France, Daya Bay in China and Reno in South Korea. They make use of a technique of placing identical electron anti-neutrino detectors located near and far to nuclear reactors, the neutrino source, and measure the electron anti-neutrino survival probability. However, to calculate precisely θ_{13}, the value of other parameter, the mass difference Δm^2_{13}, is needed. Currently, this value is calculated by association with the measurements of Δm^2_{23} and Δm^2_{12}, based on three flavor hypothesis. In this work, we propose a calculation of Δm^2_{13} and θ_{13}, combining results of the three reactor neutrino experiments, taking advantage of the fact that the experiments have different base lines.

Abstract ID. 251 - 2

Title	Cosmological lepton asymmetry with a nonzero mixing angle θ_{13}
Author	Urbano França (IFIC (CSIC/Universidad de Valencia))
Co-authors	E.Castorina et al.

While the baryon asymmetry of the Universe is nowadays well measured by cosmological observations, the precision of the bounds on the lepton asymmetry in the form of neutrinos are still significantly weaker. We place limits on the relic neutrino asymmetries using some of the latest cosmological datasets, taking into account flavor oscillations. We present our results for two different values of the neutrino mixing angle θ_{13}, and show that for large θ_{13} the limits on the total neutrino asymmetry become more stringent, diluting even large initial flavor asymmetries. Finally, we perform a forecast for COrE as an example of a future CMB experiment, and find that it could improve the limits on the total lepton asymmetry approximately by up to a factor 5.

Abstract ID. 252 - 3

Title	Cosmological neutrino mass constraint from the WiggleZ Dark Energy Survey
Author	Signe Riemer-Sørensen (University of Queenland)
Co-authors	C. Blake, D. Parkinson, and T. Davis

The absolute neutrino mass scale can be constrained from observations of the cosmological large-scale structure. Using data from the WiggleZ galaxy Survey we obtain a limit of $\sum m_\nu < 0.29$eV (95%CL) when combining with WMAP data and measurements of the Hubble parameter and the baryon acoustic oscillation scale. The WiggleZ high redshift star-forming blue galaxy sample is less sensitive to systematic effects from non-linear structure formation, pairwise galaxy velocities, redshift-space distortions, and galaxy bias than previous surveys providing a robust neutrino mass constraints.

Abstract ID. 253 - 1

Title	Sensitivity Studies for LBNE using GLoBES
Author	Jonathan Insler (Louisiana State University)
Co-authors	

The proposed Long Baseline Neutrino Experiment (LBNE) aims to determine neutrino mass hierarchy and detect possible CP violation in the neutrino sector. We use GLoBES, a software package created to simulate neutrino experiments, to predict the sensitivity of the experiment to these parameters. In particular, we are interested in quantifying the effects of the detector's energy resolution and energy bias on the sensitivity. To reach a more accurate representation of systematic uncertainties in GLoBES such as energy resolution and bias, we have performed an independent crosscheck of GLoBES's sensitivity calculations. In this poster we present a summary of our sensitivity studies with GLoBES for LBNE.

Abstract ID. 254 - 2

Title	Constraining neutrino masses using observations of 21cm radiation
Author	Yoshihiko Oyama (SOKENDAI)
Co-authors	Kazunori Kohri, Akie Shimizu

These days there is growing interest in observations of the high-redshift universe with the 21cm radiation of neutral hydrogen.The 21cm radiation traces a distribution of matter in the universe, and obtained signals can be used to constrain cosmological parameters.We explore prospects for future observations of the 21cm signal from an epoch of reionization, and show possibilities of constraining neutrino mass, effective number of neutrino species and its mass hierarchy.

Abstract ID. 255 - 3

Title	Magnetic dipole moment and keV neutrino dark matter
Author	Ryo Takahashi (Osaka University)
Co-authors	Chao-Qiang Geng

We study magnetic dipole moments of right-handed neutrinos in a keV neutrino dark matter model. This model is a simple extension of the standard model with only right-handed neutrinos and a pair of charged particles added. One of the right-handed neutrinos is the candidate of dark matter with a keV mass. Some bounds on the dark matter magnetic dipole moment and model parameters are obtained from cosmological observations.

Abstract ID. 256 - 1

Title	Taking into account the change of neutrino momentum in matter in Wolfenstein's equation for passing neutrino through matter
Author	Kh. M. Beshtoev (JINR)
Co-authors	

It is shown that Wolfenstein's equation, for neutrino passing through the matter, contains a disadvantage. There it is supposed that neutrino energy and effective mass in matter change but its momentum does not change. It leads, for example, to changing of neutrino effective mass by the value of $0.87 \cdot 10^{-2}$ eV from the very small value of energy interaction neutrino in matter, which is equal to $5 \cdot 10^{-12} eV$. This work is also devoted to solution this equation when it is taking into account not only change neutrino energy and effective mass in matter but also its momentum. Then in solution this equation a very small enhancement of neutrino oscillations in the solar matter appears due to the smallness of the energy interaction neutrino in matter but at very high matter densities (for example, in super new stars) there can arise resonance enhancements of neutrino oscillations.

Abstract ID. 257 - 2

Title	Asymmetric Neutrino Reactions from Magnetized Proto-Neutron Stars in fully Relativisitc Framework
Author	Tomoyuki Maruyama (Colege of Biorecouce Sciences, Nihon University)
Co-authors	

Abstract ID. 258 - 3

Title	The LBNE Near Detector Complex
Author	Christopher Mauger (Los Alamos National Laboratory)
Co-authors	The LBNE Collaboration

Abstract ID. 259 - 1

Title	The three-loop neutrino mass model and its constraints from current experimental data and theoretical bounds
Author	Kei Yagyu (National Taiwan University)
Co-authors	Mayumi Aoki, Shinya Kanemura and Kei Yagyu

Abstract ID. 260 - 2

Title	Ricochet: A Coherent Neutrino Scattering Experimental Program
Author	Enectali Figueroa-Feliciano
Co-authors	The Ricochet Collaboration

Coherent elastic Neutrino-nucleus Scattering (CNS) is a precisely-predicted but as-yet undetected standard model interaction. Measurements of the CNS spectrum and CNS oscillation searches provide a probe of physics beyond the standard model, through potential non-standard neutrino interactions and/or sterile neutrinos. Low-energy-threshold crystalline cryogenic detectors are very well suited for CNS experiments. The Ricochet experimental program comprises several potential experiments, from an initial 'CNS discovery' experiment at the MIT nuclear research reactor, to searches for sterile neutrinos at reactor, decay-at-rest, and electron-capture neutrino sources. These experiments will open a completely new channel to probe physics beyond the standard model.

Abstract ID. 261 - 3

Title	Project X at Fermilab
Author	Robert S Tschirhart (Fermi National Accelerator Laboratory)
Co-authors	

Abstract ID. 262 - 1

Title	The LUX Experiment
Author	Simon Fiorucci (Brown University)
Co-authors	The LUX Collaboration