

LOIs Relevant to NF07 - Applications

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Applications Topical Group

NF07 LOI Statistics

- 41 LOIs tagged or found to be relevant for ‘Applications’
 - 11 LOIs with NF07 as Primary Topical Group

- Near universal application focus is nuclear nonproliferation

- Largest overlap with:
 - NF02 - Sterile Neutrinos 21/41
 - NF09 - Artificial Neutrino Sources 24/41
 - NF10 - Neutrino Detectors 28/41

Thematic Groupings - 'CEvNS'

- Efforts developing very low threshold detectors that may be able to detect reactor neutrinos via CEvNS

CF189	CYGNUS: A nuclear recoil observatory with directional sensitivity
CF012	Metastable Water: Breakthrough Technology for Dark Matter & Neutrinos
NF157	Magnetic Microcalorimeters for CEvNS Detection
NF017	Neutrino Physics with Noble Liquid Bubble Chambers
NF095	Future COHERENT physics program at the SNS
NF104	MIVER CEvNS Experiment - A Tool for Discovery of New Physics and Applied Reactor Monitoring
NF067	Far-Future COHERENT physics program at the SNS
NF011	Noble Liquids for the Detection of CEvNS from Artificial Neutrino Sources

Thematic Groupings - 'Far-Field'

- large, underground experiments and R&D efforts - detect reactor neutrinos via IBD at medium-to-long baselines

NF185	Reactor and Geo Neutrinos at SNO+
NF186	Detecting Antineutrinos from Distant Reactors using Pure Water at SNO+
NF099	Neutrino Detection and Ranging
NF096	The deployment of kiloton-scale neutrino detectors at the Advanced Instrumentation Testbed in Boulby England
NF100	Encapsulation of Photosensors in kton–Mton Scale Neutrino Detectors
NF098	A kiloton-scale water-based liquid scintillator detection concept for the Advanced Instrumentation Testbed in Northern England
NF097	A kiloton-scale gadolinium-doped water detection concept for Neutrino Experiment One at the Advanced Instrumentation Testbed in Northern England
NF095	Antineutrino detection at THEIA
NF201	Ocean Bottom Detector

Thematic Groupings - 'Near-Field'

- small, shallow or surface experiments and R&D efforts - detect reactor neutrinos via IBD (mostly) at short baselines

NF179	NuLat: A Compact Anti-Neutrino Detector
NF075	CHANDLER: A Technology for Surface-level Reactor Neutrino Detection
NF168	Forthcoming Science from the PROSPECT-I Data Set
NF169	The Expanded Physics Reach of PROSPECT-II
NF035	The JUNO-TAO Experiment
NF030	LiquidO: a Novel Approach to Detecting Neutrinos
NF118	3D-projection Scintillator Tracker (3DST) in SAND, a DUNE Near Detector Subsystem
NF180	Neutrino Physics and Nuclear Security Motivations for the Continued Development of Organic Scintillators with Pulse Shape Discrimination Capability and ⁶ Li-doping
NF149	An Application of Pulse Shape Sensitive Plastic Scintillator - Segmented AntiNeutrino Directional Detector (SANDD)
NF153	Measuring Inelastic Charged- and Neutral-Current Antineutrino-Nucleus Interactions with Reactor Neutrinos
NF108	ORNL Neutrino Sources for Future Experiments
NF184	ROADSTR: a Mobile Antineutrino Detector Platform for enabling Multi-Reactor Spectrum, Oscillation, and Application Measurements

'Reactor Flux and Spectrum'

- Improving Reactor Flux and Spectrum knowledge

NF086	Legacy of the Daya Bay Reactor Antineutrino Experiment
NF140	High-Resolution Multiphysics Reactor Modeling for the Antineutrino Source Term
NF117	Prediction and Measurement of the Reactor Neutrino Flux and Spectrum

'Pipeline'

- Importance of small experiments for training

CommF48	<i>Training a Diverse HEP Workforce in Small Neutrino Experiments</i>
NF135	Neutrino Town Hall Input

'Synergies and Utility'

- Describing the utility case for nonproliferation applications and synergies with HEP topics

NF183	PROSPECT: a Case Study of Neutrino Physics Research providing Enabling Capabilities for Nuclear Security Applications
NF128	Mutual Benefits derived from the Application of Neutrino Physics to Nuclear Energy & Safeguards
NF136	Nu Tools: Exploring Practical Roles for Neutrinos in Nuclear Energy and Security

Thoughts on White Papers

- NF07 topical conveners would like to see white papers (or sections) that further develop the overlaps and synergies between HEP and nonproliferation applications

- Synergies specific to a class of experiment might naturally be coordinated within the relevant thematic group, e.g.:
 - CEvNS
 - Far-Field
 - Near-Field

Future Activities

- Discuss white papers with identified thematic groupings
- Participate in workshop activities of overlapping Topical Groups, eg
 - NF02 (Sterile Neutrinos) in late September
 - NF09 (Artificial Sources) in December - session dedicated to reactor flux and spectrum predictions

- *Please reach out with any questions or suggestions*