



Introduction to WG5 talks

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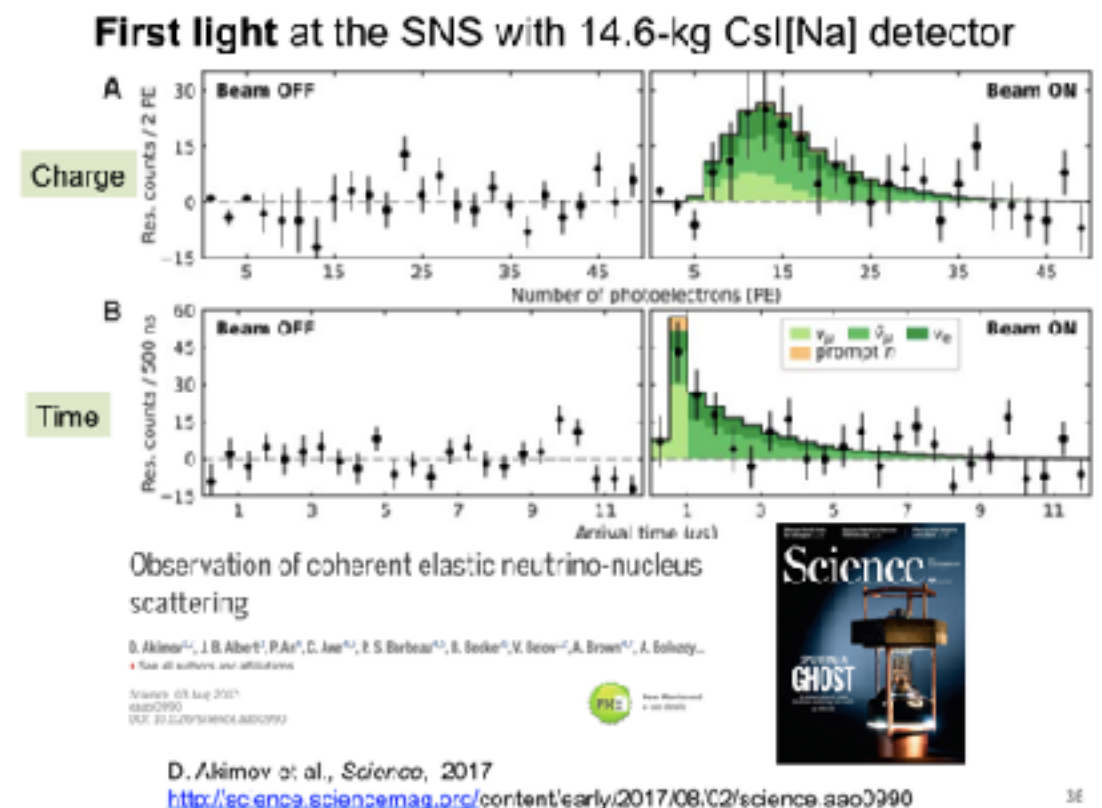
Pedro Machado, FNAL, USA

WG5 created back in 2016

We try to cover both theory and experiments
(and 2 conveners are theorist, one is experimentalist, this is my 3rd year)

Highlight of 2017: observation of CENNS
—> It becomes a new tool to look for NP!

(we have section on Tuesday about that!)



K.Scholberg- NUFAC2017

SM well established with the Higgs discovery back in 2012

NO firm evidence of BSM physics anywhere

Still (at least) some experimentally driven questions need to be answered:

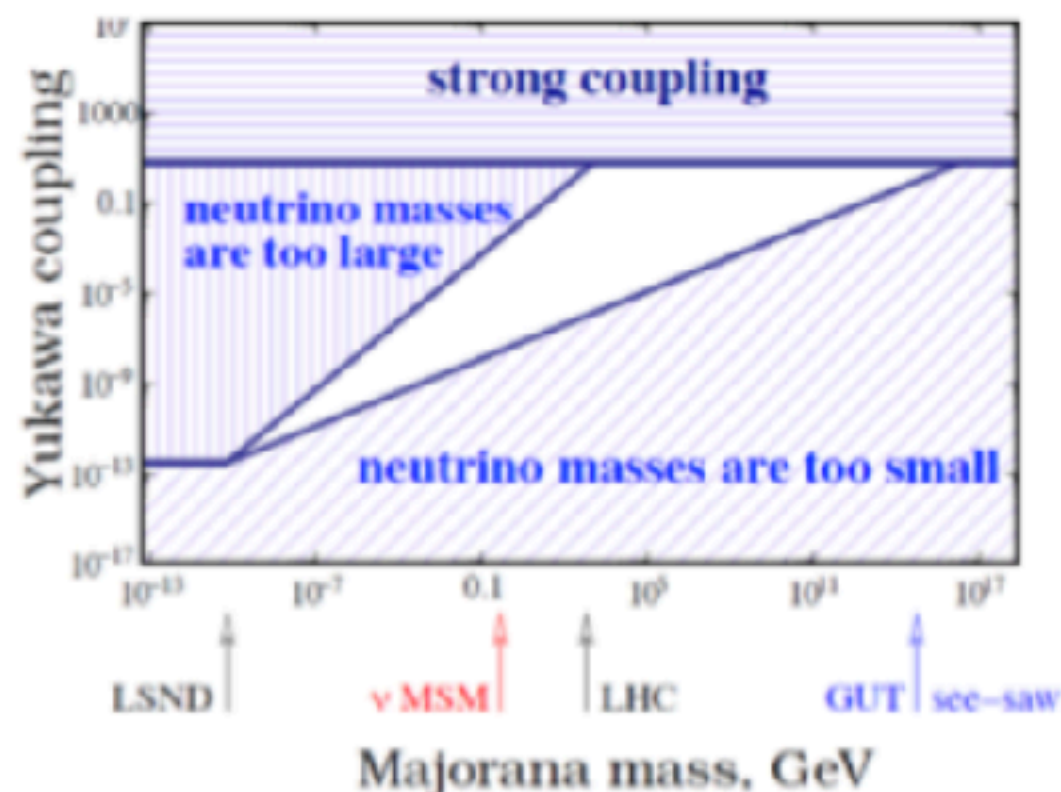
- what is the origin of the active neutrino masses?
- what is dark matter made of?
- baryogenesis

Neutrinos can help answering these questions!

consequences of neutrino oscillations

Where does the ν mass come from?

One remarkable possibility: see-saw mechanism (type I) with one/two/three massive and sterile Majorana-type neutrinos



WIF - KOREA 11-15 JULY 2016

WB

WB-NUFACT2016

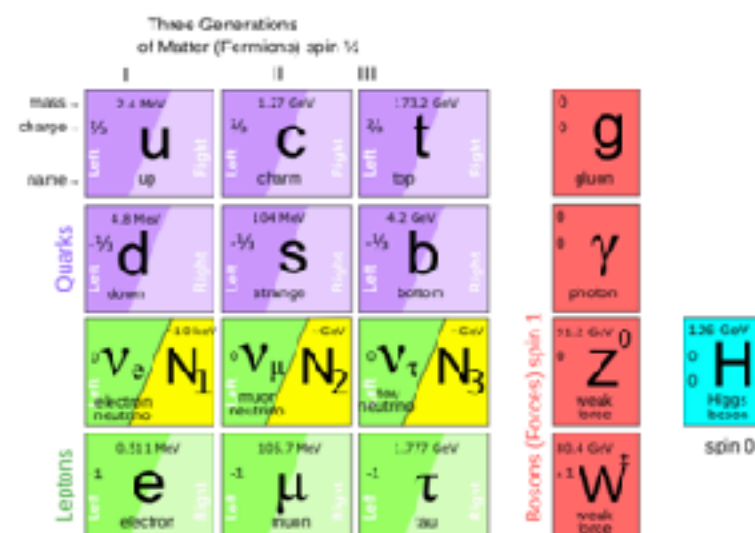
The neutrinos can come in rescue!

An example:

3 Majorana (HNL) partners of ordinary ν , with $M_N < M_W$

In a peculiar parameter space ν MSM explains:

neutrino masses (see-saw),
baryogenesis (via lepto-genesis)
and DM (N_1)!



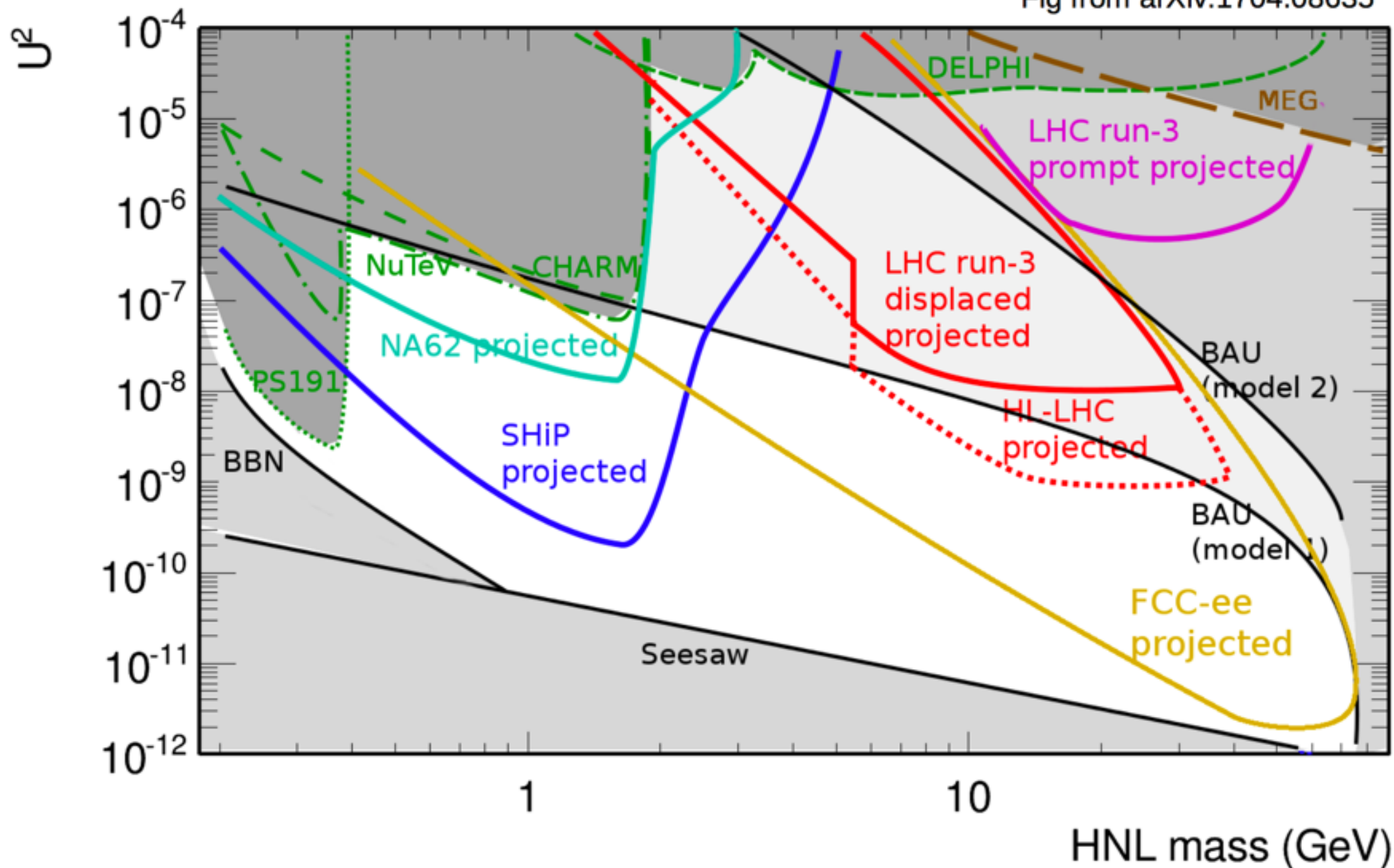
ν MSM: T.Asake, M.Shaposhnikov PL **B620** (2005) 17
M.Shaposhnikov Nucl. Phys. B763 (2007) 49

Topics of WG5 - Beyond PMNS:

- non-unitarity of the PMNS matrix and theoretical models beyond PMNS
- searches for right handed sterile neutrinos with oscillation experiments —> **very hot topic with many competing experiments to check hints from reactors and LNSD anomalies; new very exciting results are coming out or expected very soon!**
 one sad news this year with the canceling of SOX experiment
 —> **a combined session with WG1 on new measurements**
 A discovery here may be around a corner BUT also the rejection of the sterile neutrino hint could be around the corner!
- searches of right handed sterile neutrinos with missing mass/direct decay
 —> **next year very important since the ESPP is expected to give an indication about SHiP@CERN approval; this NUFACT edition talk on LHC results**

N at CERN in a 10-year timesecale ... and beyond

Fig from arXiv:1704.08635



Topics of WG5- Beyond PMNS:

- **sterile neutrinos and $0\nu 2\beta$ decay, measurements of $0\nu 2\beta$ decay**
- **connection between neutrinos and dark matter**
 - > **there were good hopes to resolve the 3.5KeV hint with X-ray observation from the (Astro-H) Hitomi satellite ; unfortunately lost—> need to wait for a new mission**
- **dark sector and dark matter searches at neutrino experiments**

Topics of WG5- Beyond PMNS:

- **neutrinos and non-standard interactions (NSI)**
- **NSI and non unitarity as systematics to CP Dirac phase measurement in oscillation experiments**
- **BSM physics in oscillation experiments**
 - > **we have a whole session about what could be measured with DUNE**
- **CENNS and new physics with CENNS (many talks at this conf)**
- **leptogenesis models**

Almost all these topics covered also this year with plenary or parallel sessions
Of course a lot of overlap with the other WG's!

Strategy for talk selection for our parallel sections:

select speakers, possibly young post-docs, authors of papers posted on arXiv during the last year

- > most up-to-date topics of research**
- > frontier talks!**

Also we try not to be repetitive from previous years

Grouping of talks in sessions of similar topics not trivial at all due to non availability of speakers, cancellations or request for specific dates from speakers...

Monday 13 August 2018

Convener: Paul Soler

14:00	[81] Probing neutrino coupling to a light scalar with coherent neutrino scattering	XU, Xun-Jie
14:30	[82] Average Csl neutron density distribution from COHERENT data	CADEDDU, Matteo
15:00	[84] Coherent Elastic Neutrino Nucleus Scattering (CEvNS) as a probe of Z-prime through kinetic and mass mixing effects	DENT, James
15:30	[83] A short travel for neutrinos in Large Extra Dimensions	VITTI STENICO, Gabriela

Monday 13 August 2018

16:30	[85] Neutrino flavor transformation in supernova as a probe for nonstandard neutrino-scalar interactions	KNELLER, Jim
17:00	[86] Standard and non-standard neutrino physics at reactor experiments	FORERO , David Vanegas
17:30	[194] Measuring the Leptonic Dirac CP Phase with Muon Decay at Rest	GE, Shao-Feng

Tuesday 14 August 2018

WG5 - 110B (14:00-16:00)

time	[id] title	presenter
14:00	[87] Boosted Dark Matter at DUNE	KIM, Doo Jin
14:30	[88] Probing secret interactions of eV-scale sterile neutrinos with the diffuse supernova neutrino background	RENO, May Hall
15:00	[89] Neutrino Oscillations in Dark Backgrounds	VECCHI, Luca
15:30	[90] Light scalar dark matter at neutrino oscillation experiments	WHISNANT, Kerry

Thursday 16 August 2018

Plenary VII - 130 (09:00-10:30)

-Conveners: Georgia Karagiorgi

time	[id] title	presenter
09:00	[141] Shedding light on low energy excess anomaly with MiniBooNE and MicroBooNE	PAVLOVIC, Zarko
09:30	[17] LHC Results on heavy Neutrino Searches	YANG, Un Ki
09:50	[18] FNAL SBL Program Status	FAVA, Angela

WG5 - 110B (14:00-16:00)

time	[id] title	presenter
14:00	[91] A reappraisal of constraints on Z-prime models from unitarity and direct searches at the LHC	BHANDOPDHAY, Triparno
14:30	[92] Model independent non-unitarity	MINAKATA, Hisakazu
15:00	[93] Exploring the Potential of Short-Baseline Physics at Fermilab	PASQUINI, Pedro
15:30	[94] Status of the ISODAR project	AXANI, Spencer

WG5 - 110B (16:30-18:00)

time	[id] title	Convener: Alain Blondel	presenter
16:30	[95] Lepton-Number-Charged Scalars and Neutrino Beamstrahlung		KELLY, Kevin
17:00	[96] Sterile neutrinos searches		HERNANDEZ-GARCIA, Josu
17:30	[97] New technique for neutrinoless double beta decay		PSIHAS, Fernanda

Friday 17 August 2018

Plenary X - 130 (11:00-12:30)

-Conveners: Alex Friedland

time [id] title presenter

11:30	[35]	Neutrino Dark Matter Connections	KRNJAIC, Gordon
12:00	[16]	Coherent Scattering Results and Future	BARBEAU, Phil

WG5 - 110B (14:00-16:00)

time [id] title presenter

14:00	[98]	DUNE and CPT-violating Neutrinos	TERNES, Christophe
14:30	[99]	Future DUNE constraints on EFT	DI CORTONA, Giovanni Grilli
15:00	[100]	Solar nu at DUNE and BSM	LI, Shirley
15:30	[101]	Neutrino trident at DUNE	HOSTERT, Matheus

WG1+WG5 - 130 (16:30-18:02)

Convener: Jianming Bian

time [id] title presenter

16:30	[192]	ICARUS	TSA, Yun-Tse
16:53	[190]	Sterile Neutrinos search via NC dis at NOvA	WALLBANK, Michael
17:16	[191]	Latest Results from MINOS+ on Sterile Neutrinos search	TODD, Jacob
17:39	[193]	First Results from the PROSPECT Short Baseline Reactor Experiment	BOWDEN, Nathaniel

We expect many exciting sessions!

For a summary of results that will be presented I invite you to the summaries session on Saturday morning!