Winter Workshop on Neutrino-Nucleus Interactions

Joint Experimental-Theoretical Working Group

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Report to NuSTEC Board, 16 November 2017

Winter Workshop on Neutrino-Nucleus Interactions

- About a year ago, the theory group was brainstorming workshops for 2017.

- Pilar Coloma and I suggested this topic, which met with unanimous enthusiastic response.

- In our parlance, “winter workshops” do not entail work (by us in the TPD), but are intended as learning events.

- Chat with Jorge Morfin last Dec’16 $\Longrightarrow$ irresistible idea to make use of the speakers coming @ NuSTEC School.

Winter Workshop on Neutrino-Nucleus Interactions

chaired by Andreas Kronfeld (Fermilab), Pilar Coloma (Fermilab)

from Monday, 6 November 2017 at **10:00** to Thursday, 16 November 2017 at **16:00** (US/Central)
at **Fermilab, Wilson Hall**
Kirk Road and Pine Street, Batavia IL 60510

Manage

Description No registration necessary: come as you would to any Theoretical Physics Seminar.

The future neutrino program at Fermilab will aim to measure neutrino oscillation parameters with an accuracy at the percent level. Since oscillation experiments rely on the interactions of neutrinos with bound nucleons inside atomic nuclei, a commensurate effort is therefore needed towards the understanding and modeling of the hadronic and nuclear physics of such interactions. The aim of this workshop is to provide a pedagogical introduction to the key aspects of neutrino-nucleus interactions and the open problems in the field.

Questions? ***Email:*** ask@fnal.gov

Go to day

Monday, 6 November 2017

10:30 - 12:00 Theoretical Description of Neutrino-Nucleon Scattering *1h30'* (Curia II)
Speaker: Richard Hill (University of Kentucky & Fermilab)
Material: **Slides**

13:00 - 14:30 Theoretical Description of Lepton-Nucleus Scattering *1h30'* (WH1E)
Speaker: Wally Van Orden (Old Dominion)
Material: **Slides**

15:00 - 16:30 Effective Field Theories for Electroweak Interactions in Nuclei *1h30'* (WH1E)
Speaker: Saori Pastore (LANL)
Material: **Slides**

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Tuesday, 7 November 2017

10:30 - 12:00 Lepton-nucleus Scattering in the Impulse Approximation *1h30'* (Curia II)
Speaker: Artur Ankowski (SLAC)
Material: **Slides**

13:30 - 15:00 Lepton-nucleus Scattering in the Random-phase Approximation *1h30'* (Curia II)
Speaker: Natalie Jachowicz (Ghent University)
Material: **Slides**

Thursday, 16 November 2017

10:30 - 12:00 Systematics in Neutrino Oscillation Experiments *1h30'* (WH10NW)
Speaker: Sara Bolognesi (IRFU, CEA Saclay)

14:30 - 15:30 The Quantum Monte Carlo Approach to Nuclear Structure and Neutrino-Nucleus Interactions (Theoretical Physics Seminar) *1h0'* (WH3NE)
Speaker: Alessandro Lovato (Argonne)

https://indico.fnal.gov/event/14934/

Joint Experimental-Theoretical Working Group

- Minerba Betancourt suggested expt-theo, (young-old?) group to foster real work on the topic in Fermiland.

- Some theory projects:
  - interfacing theory and generators: lattice QCD, nuclear models, software frameworks in collider physics;
  - radiative corrections for $\sigma_{\nu e}/\sigma_{\nu \mu}$, including structure dependence & signal definition;
  - ever shallower “deep” inelastic scattering.

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As soon as I understand what they're doing,
I'll work on something!

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- ever shallower "deep" inelastic scattering.