

Particle Physics with Neutrons at the ESS

Monday 10 December 2018 - Friday 14 December 2018

Geovetenskaps hus (room:Högbomsalen), Stockholm University

Programme

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Monday 10 December 2018

Registration (08:00-09:00)

Introduction and welcome (09:00-11:00)

time	title	presenter
09:00	Welcome from Nordita	
09:15	Welcome and practical details	
09:30	The ANNI instrument	SOLDNER, Torsten
10:00	The HIBEAM experiment	Prof. MILSTEAD, David
10:30	How far can we get with in-beam UCN production at the ESS?	ZIMMER, Oliver

The European Spallation Source (11:15-12:15)

time	title	presenter
11:15	Status of the ESS	KENNEDY, Shane
11:45	Q&A ESS	

nEDM (14:00-17:00)

time	title	presenter
14:00	Neutron EDM: * Why we want to measure it * Why is it so difficult	PIGNOL, Guillaume
14:20	nEDM at the SNS	SWANK, Christopher
14:40	The Neutron Beam EDM Experiment at ESS	FLORIAN PIEGSA
15:00	Status of the TUCAN EDM experiment	PICKER, R
15:20	Break	
15:40	Search for a neutron EDM at PSI	PHILIPP SCHMIDT WELLENBURG
16:00	Neutron EDM searches at the ILL: present and future	DEGENKOLB, Skyler
16:20	Strategies for a cryogenic neutron EDM measurement	CLARK GRIFFITH
16:40	nEDM experiment at LANL	TAKEYASHU ITO

Tuesday 11 December 2018

Mirror neutrons (1) -- Chair Yuri Kamyshev (09:00-12:30)

- Conveners: Prof. BEREZHIANI, Zurab; Prof. KAMYSHKOV, Yuri

time	title	presenter
09:00	A. Serebrov (PNPI, NRC KI) Neutron Lifetime and Sterile Oscillations	Prof. SEREBROV, Anatoly
09:50	Z. Berezhiani (L'Aquila and LNGS) The nn' oscillations and neutron lifetime	Prof. BEREZHIANI, Zurab
10:20	Coffee Break 20'	
10:40	Prof. Kenji MISHIMA (KEK) Neutron Lifetime by Appearance	Prof. MISHIMA, Kenji
11:10	Z. Tang (LANL) Proposed UCNProbe Experiment to Measure Branching $n \rightarrow p/n \rightarrow$ all	Dr. TANG, Zhaowen
11:40	A. Dolgov (ITEP and Novosibirsk U.) Viewing Cosmological Issues with Mirror Matter	Prof. DOLGOV, Alexandre
12:00	Discussion 20'	

Hadronic Parity violation (14:00-16:40)

time	title	presenter
14:00	Nonleptonic weak interactions in NN and few nucleon systems	MICHELLE, Vivani
14:20	Lattice gauge theory calculations of NN weak amplitudes	EVAN BERKOWITZ, Juelich
14:40	Parity odd and time reversal odd NN interactions	VLADIMIR, Gudkov
15:00	NOPTREX time reversal violation experiment and NN weak interactions	DAVID, Bowman
15:20	Break	
15:40	Present status of the NN weak interaction and recent results	FRY, Jason
16:00	NN weak interaction experiment opportunities at the ESS	CRAWFORD, Chris
16:20	Results from the NPDGamma n-p weak interaction experiment at SNS	BARRÓN-PALOS, Libertad

Wednesday 12 December 2018

Mirror neutrons (2) -- Chair Zurab Berezhiani (09:00-12:30)

- Conveners: Prof. BEREZHIANI, Zurab; Prof. KAMYSHKOV, Yuri

time	title	presenter
09:00	Ricardo Biondi (U. L'Aquila and LNGS) Analysis of nn' Experiments at ILL/Grenoble	Dr. BIONDI, Ricardo
09:30	Klaus Kirch (PSI, ETH) Analysis of Current nn' Search Experiment at PSI	Prof. KIRCH, Klaus
10:00	Albert Young (NCSU) Search for nn' by spin precession	Prof. YOUNG, Albert Young
10:30	Coffee Break 20'	
10:50	Yuri Kamyshev (U. Tennessee) Neutron Transition Magnetic Moment and nn' Oscillations	Prof. KAMYSHKOV, Yuri
11:20	Leah Broussard (ORNL) Search for nn' at HFIR at ORNL	Dr. BROUSSARD, Leah
11:50	Joshua Barrow (U. Tennessee) Sensitivity of HBEAM at ESS/ANNI to nn' search	Mr. BARROW, Joshua
12:20	Discussion 10'	

Neutron-antineutrons oscillations (1) (14:00-17:45)

time	title	presenter
14:00	Processes that break baryon number by two units and their implications	GARDNER, Susan
14:25	Neutron-antineutron oscillations in nuclei	RICHARD, Jean Marc
14:50	nnbar - title tba	VAINSHTEIN, Akady
15:15	HIBEAM/nnbar backgrounds	MEIROSE, Bernhard
15:40	Break	
16:00	A new operating mode in experiments searching for free neutron-antineutron oscillations based on coherent neutron and antineutron mirror reflections	NESVIZHEVSKY, Valery
16:25	nnbar discussion/plans	YOUNG, Albert

Workshop Dinner (19:00-21:00)

Thursday 13 December 2018

Neutron-antineutrons oscillations (2) (09:00-10:50)

time	title	presenter
09:00	UCN facility at VVRM	A. SEREBROV
09:25	Lattice calculations for nnbar	RINALDI, Enrico
09:50	Project of an experiment to search for neutron-antineutron oscillations at reactor WWR-M	FOMIN, Alexey
10:10	nnbar and dinucleon decay at DUNE	JWA, Yeon-jae
10:30	Break	

Precision neutron decay (1) (10:50-12:40)

- Conveners: SOLDNER, Torsten; GONZALEZ-ALONSO, Martin

time	title	presenter
10:50	Most promising strategy for future measurements in neutron beta decay: a theory view	GONZALES-ALONSO, Martin
11:20	Precise theory predictions in neutron decay	Dr. CZARNECKI, Andrzej
11:45	Precise theory predictions in neutron beta decay: current limitations and challenges	Dr. GORSHTEYN, Mikhail
12:10	First-principles lattice QCD calculations of the neutron beta decay: challenges and prospects	Dr. RINALDI, Enrico

Precision neutron decay (2) (14:10-17:10)

time	title	presenter
14:10	UCNtau and prospects of neutron lifetime measurements	Dr. PATTIE, Robert
14:40	An attempt to discuss the "ultimate" determination of correlation coefficients in neutron beta decay	Dr. BAESSLER, Stefan
15:15	Measurements of correlation coefficients with electron tracking and electron spin determination	Dr. BODEK, Kazimierz
15:45	break	
16:00	Magnet concept for measurements of neutron decay correlations at the ESS	Dr. MÄRKISCH, Bastian
16:25	Cyclotron radiation spectroscopy for neutron decay	Dr. VANDEVENDER, Brent

Friday 14 December 2018

Neutrons in cosmology -- Chair Katherine Freese (09:00-12:25)

- Conveners: Prof. BEREZHIANI, Zurab; Prof. KAMYSHKOV, Yuri

time	title	presenter
09:00	Shmuel Nussinov (Tel Aviv U.) Clustering of Dark Matter	Prof. NUSSINOV, Shmuel
09:30	Pierluigi Belli (INFN, Rome II) New Results of DM Search with MM as a Possible Candidate	Prof. BELLI, Pierluigi
10:00	Massimo Mannarelli (LNGS) nn' Conversion and Neutron Stars	Prof. MANNARELLI, Massimo
10:30	Coffee Break 20'	
10:50	Zurab Berezhiani (for Fabrizio Nesti, U. L'Aquila and LNGS) DM Distribution in Galaxies - Does It Limit MM?	Prof. BEREZHIANI, Zurab
11:20	Torsten Bringmann (U. Oslo) Cogenesis from Neutron-Dark Matter Oscillations	Prof. BRINGMANN, Torsten
11:50	Christophe Grojean (DESY and Humboldt U.) Implications of an Improved Neutron-Antineutron Oscillation Search for Baryogenesis: A Minimal Effective Theory Analysis	Prof. GROJEAN, Christophe
12:15	Discussion 10'	

Outlook and summary (13:25-14:45)

time	title	presenter
13:25	ESS in the Future HEP landscape	Dr. FALKOWSKI, Adam
14:00	Workshop summary/proceedings	