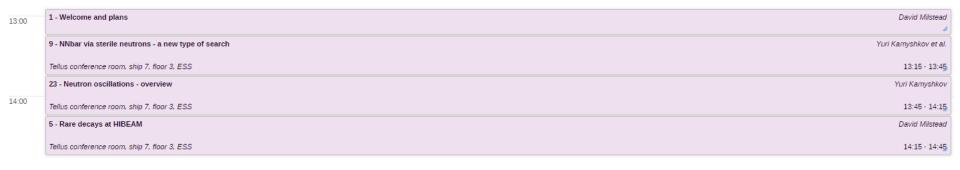
Welcome

Afternoon sessions

- Yuri + Tennessee/US folk connecting
- Mike in grant review



15:00		
	2 - ESS - status and plans	Valentina Santoro
	Tellus conference room, ship 7, floor 3, ESS	15:20 - 15:50
	3 - Lower moderator	Luca Zanini
16:00		
	Tellus conference room, ship 7, floor 3, ESS	15:50 - 16:20
	12 - Engineering issues for NNBAR	Luca Zanini
	Tellus conference room, ship 7, floor 3, ESS	16:20 - 16:50
	20 - Differential reflectors	Matthew Frost
17:00		
	Tellus conference room, ship 7, floor 3, ESS	16:50 - 17:20

10:00	6 - Lucia procession/celebration	
		10:00 - 10:30
	7 - Tour of ESS	
11:00		
		10:30 - 11:30
13:00	16 - Using the annihilation generator	Joshua Barrow

	20 Comp and animalian generalist	
	Tellus conference room, ship 7, floor 3, ESS	13:00 - 13:30
	19 - Shielding for HIBEAM and NNBAR	Valentina Santoro
	Tellus conference room, ship 7, floor 3, ESS	13:30 - 14:00
14:00	15 - Backgrounds and how the complete simulation/estimation chain	Bernhard Meirose et al.
	Tellus conference room, ship 7, floor 3, ESS	14:00 - 14:30
		# A D D D

	21 - Test bench in Stockholm	Katherina Dunne
	Tellus conference room, ship 7, floor 3, ESS	14:30 - 15:00
15:00	17 - Neutron detectors	Lisa Debeer-Schmitt et al.

Break	
Tellus conference room, ship 7, floor 3, ESS	15:00 - 15:30
2 10000	Elsa Dobber Comma et al.

	Tellus conference room, ship 7, floor 3, ESS	15:00 - 15:3 <u>0</u>
	Break	
16:00	14 - Annihilation detector	Anders Oskarsson
	Tellus conference room, ship 7, floor 3, ESS	15:45 - 16:15
	10 - HIBEAM/NNBAR@ILL	Albert Young

16:00	Tellus conference room, ship 7, floor 3, ESS	15:45 - 16:15
	10 - HIBEAM/NNBAR@ILL	Albert Young
	Tellus conference room, ship 7, floor 3, ESS	16:15 - 16:45
	13 - HIBEAM funding/plans	
17:00	Tally conference seem this 7 feet 2 ESS	16:45 17:15

16:45 - 17:1<u>5</u>

Tellus conference room, ship 7, floor 3, ESS

Where are we?

- Paper nearly "oven ready"
 - Fair estimates of nn' and nnbar sensitivity for HIBEAM and the challenges for the next steps
- Open questions of shielding, engineering amd detector design.

New high-sensitivity searches for neutrons converting to antineutrons and/or sterile neutrons

HIBEAM/NNBAR collaboration: names

the date of receipt and acceptance should be inserted later

Abstract The HIBEAM/NNBAR experiment is a proposed two-stage experiment for the European Spallation Source (ESS) to search for baryon number violation. The experiment would make high-sensitivity searches for baryon number violating processes: $n \to \bar{n}$ (neutron-antineutron oscillation via mixing), $n \to [n', \bar{n}'] \to \bar{n}$ (neutron-antineutron oscillation via regeneration from a sterile neutron state) $n \to n'$ (neutron disappearance), $n \to [n', \bar{n}'] \to n$ (neutron regeneration), corresponding to baryon number violation of one or two units. The experiment addresses topical open questions such as baryogenesis and dark matter, and is sensitive to a scale of new physics substantially in excess of that available at colliders. This is a cross-disciplinary experiment with a clear particle physics goal. The diverse community encompasses physicists from large collider and low energy nuclear physics experiments, together with scientists specialising in neutronics and magnetics. European, US and Asian communities are represented. The experiment would increase the sensitivity to neutron conversion probabilities by three orders of magnitude compared with previous searches. The opportunity to make such a leap in sensitivity in tests of an unexplained yet apparent global symmetry is rare and should not be missed.

Addresses of institutes

Money

- 2019
- Three applications in (KAW build the detector, environment – design, prototype, project – design)
- Obtained 3MSEK (300000 Euro) project grant
- Depending on how internal money can be used combination of 1-2 PhD students, short term money for interested folk, test set-up.

Papers

- Capability quantified with Geant (priority with personpower) and full MC (downstream and upstream)
- HIBEAM is a kind environment.
- NNBAR may not be.

What can we do?

- Test set-up at SU
 - Calo (low energy gammas + triggerless read-out, see Katie's talk)
- What type of bg measurements can be done in-situ at a commissioning ESS?
- Mirror neutrons at Oak Ridge, ILL?
- NNBAR@ILL (Albert) ?
- Plan for tests of non-bounce idea?
- Do we have PhD students/postdocs?
- Can we have a program with physics and R&D stretching over the next decade?