

NuFact 2018 - August 12-18

WG4

Muon Physics Sessions

Craig Group, MyeongJae Lee, and Frederik Wauters

Why muons at NuFact?

- Same production mechanism for muons and neutrinos.
- A neutrino factory is also a muon factory and vice versa.
- Excellent probe for physics beyond the standard model.
- Are there other connections between muon and neutrino physics?

Focus questions for WG4:

Q1: Neutrino/Muon Physics: (Overlaps with WG1 and WG5)

- What overlaps exist to non-standard model neutrino interactions?
- How would these manifest in both the near term muon/precision measurements sector & in the neutrino sector?

Q2: Beam/Machine/Detector Design: (Overlaps with WG3)

- Are the ultimate sensitivities really exploited with current facilities?
- How can we improve experiments without increasing the beam power?
- What will be the ultimate sensitivity that we can reach even by increasing beam power, and what are its implications?
- Cooled muon beams w/ phase rotations? New methods?

Q3: Program Planning: (Overlaps with WG3)

- How do you support the physics needs for both DC and pulsed (high sculpted) beam structures in the planning (and cost) of new facilities?
- How can muon physics benefit from future neutrino facilities?
- Could new ideas from muon physics developments turn out to be useful for future neutrino facilities?

Plenary Session / Review talks

Plenary session IX (8/17, Friday) 9am

Experiment - pulsed beam



Mark Lancaster

Experiment - continuous beam








Angela Papa

WG4-only sessions

Session #1 (8/13, Monday) 2-4 pm

Group - Muon cLFV Experiments - all talks 25

Charge of Working Group 4		Conveners
Status of the MEGII experiment		Angela Papa
The Search for Lepton-Flavour Violation with the Mu3e Experiment		Frederik Waters
Status of the COMET Experiment		Manabu Moritsu
The DeeMe Experiment		Daiki Nagao

WG4-only sessions

Session #2 (8/13, Monday) 4:30-6 pm

Wauters - Muon cLFV Experiments II - all talks 25

The Mu2e Experiment at Fermilab



Steve Boi

Mu2e II - A Proposed Evolution of the Mu2e Experiment



Craig Group

Studies of PRISM/PRIME - the next generation muon to electron conversion experiment.



Jaroslav Pasternak

WG4-only sessions

Session #3 (8/14 Tuesday) 2-4 pm

Wauters - Precision Physics (g-2) - all talks 25

The g-2 Experiment at Fermilab (40 min)



Jarek Kaspar

Standard Model prediction for the muon g-2



Daisuke Nomura

WG4 discussion



All

WG4-only sessions

Session #4 (8/16, Thursday) 2-4 pm

Group - cLFV at Colliders - all talks 25 min

Search for lepton flavour violation with the ATLAS detector



Wing Sheung Chang

Status of Charged Lepton Flavor Violation searches at CMS
and future prospects



Diego Beghin

Lepton Flavour Universality at LHCb



Francesca Dordei

WG4-only sessions

Session #5 (8/16, Thursday) 4:30-6 pm

Wauters - Muonic atoms/proton radius - all talks 25

The MUon Scattering Experiment (MUSE) at the Paul Scherrer Institute



Steffen Strauch

Data Analysis and Preliminary Results of the Proton Charge Radius Experiment at JLab



Chao Gu

Precision spectroscopy of exotic atoms involving muon



Sohtaro Kanda

WG4 discussion



All

WG3-WG4 joint session

Session #6 (8/17, Friday) 2-4 pm

Alex Bogacz: Accelerator and Targets for CLFV - all talks 25

Cold muonium beam for atomic physics and gravity experiments



Anna Soter

Towards a new High Intensity Muon Beam at PSI: Status and Prospects



Angela Papa

Commissioning and first results of the Fermilab Muon Campus



Ditkys Stratakis

Status of the Facility/Accelerator/Beam-line for Muon Programs at J-PARC



Hajime Nishiguchi

WG4-only sessions

Session #7 (8/17, Friday) 4:30-6 pm

Group - Overflow - all talks 25

Distinguishing muon LFV effective couplings using $\mu + e \rightarrow e + e$



Joe Sato

Searches for Electric Dipole Moments (EDM) at a Storage Ring with JEDI



Maria Zurek

Searches for heavy neutral lepton production and lepton flavour violation in kaon decays at the NA62 experiment



Stoyan Trilov

Working Group 4 summary discussions



All

Summary

- We have prepared an exciting working group program on muon physics.
- Please feel free to join any WG4 sessions - contribute, or just follow a talk or two.
- We hope to make progress on our three focus areas:
 - Synergies between muon and neutrino physics.
 - Beam/machine/experiment design.
 - Program planning - how does muon physics fit in?
- The muon working group is a somewhat unique aspect for NuFact, lacking from many other neutrino workshops.
- WG4 includes a rich physics program that naturally correlates with neutrinos from accelerators.