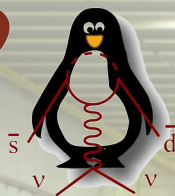


P326 **NA62**



UNIVERSITY OF
BIRMINGHAM

XXVIII International Conference on Neutrino Physics
and Astrophysics, Heidelberg, June 2018

Heavy neutral lepton searches at NA62

Lorenza Iacobuzio
University of Birmingham

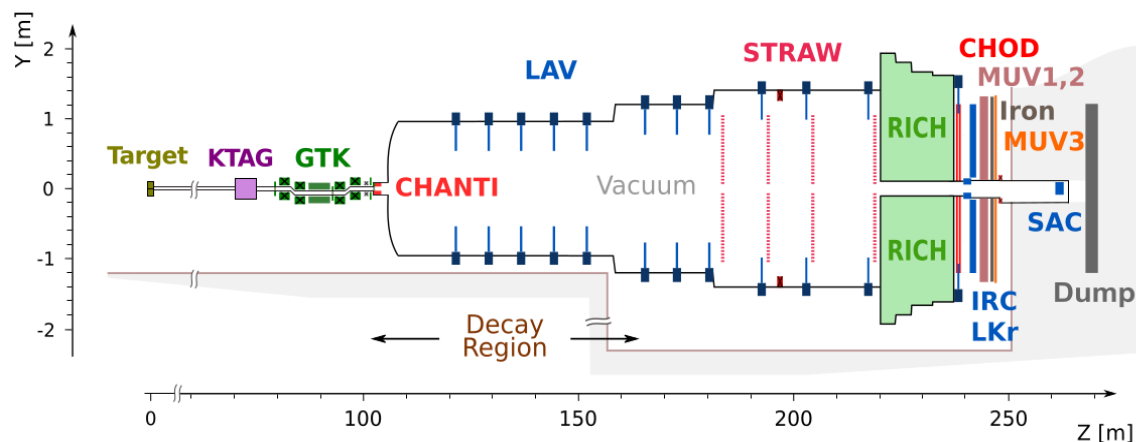
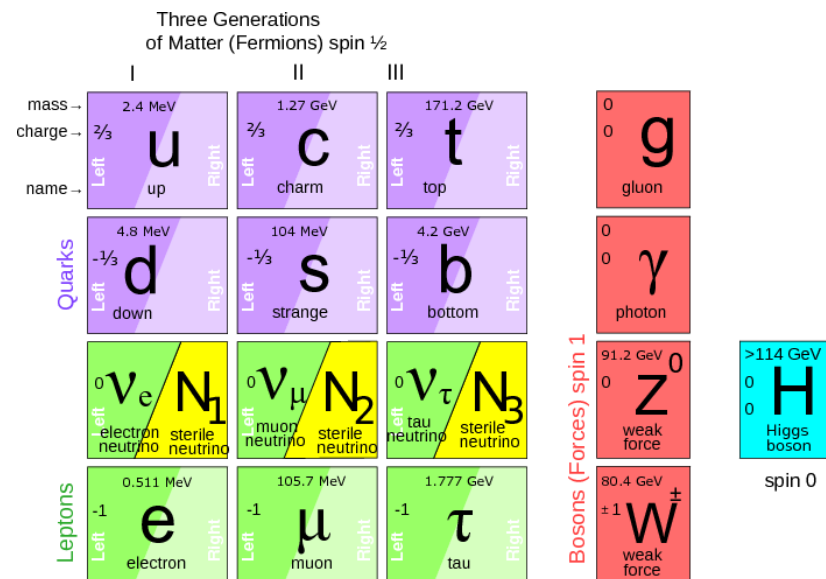
Theoretical framework and NA62 setup

- Neutrino Minimal Standard Model:

- SM extension accounting for baryon asymmetry of the universe (BAU), dark matter (DM), neutrino masses and oscillations
- 3 additional right-handed, singlet, Majorana HNLs (not observed yet)

- NA62 at CERN SPS:

- Fixed-target experiment to produce kaons and measure $B(K^+ \rightarrow \pi^+ \nu \bar{\nu})$ with 20% precision
- Data taking (2015-2018)
- Possibility to run beyond 2021
- Minimum bias run (2015) to search for HNL production in $K^+ \rightarrow l^+ N$ decays



$$B(K^+ \rightarrow \ell^+ N) = B(K^+ \rightarrow \ell^+ \nu) \cdot \rho_\ell(m_N) \cdot |U_{\ell 4}|^2$$

Technique and results

- Event selection:
 - One positive track in time with kaon
 - e, μ identified through energy-momentum ratio
- No HNL signal observed
- UL established on $B(K^+ \rightarrow l^+ N)$ and $|U_{e, \mu}^2|$
- Results improve world existing limits on HNL production searches on $|U_e^2|$ (over whole mass range) and on $|U_\mu^2|$ (for masses above 300 MeV/c²)
- Opportunity to further improve with 2016-2018 data sample

