Alessandro Granelli

University of Bologna (UniBO) and INFN

- Post-doc at UniBO, with **Prof. S. Pascoli** on **neutrino physics** and **leptogenesis** (LG).
- Ph.D. at SISSA with **Prof. S. T. Petcov** on **LG**, with **Prof. P. Ullio** on **dark matter pheno** and **astrophysics**.
- Master in Padua (Italy), with Prof. F. D'Eramo on dark matter pheno.
- Lead Singer and Guitarist in the Italian Progressive Rock Band named **Tacita Intesa**, check it out on Spotify and YouTube...

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

INFN

Theory and Phenomenology
of Fundamental Interactions
UNIVERSITY AND INFN · BOLOGNA

Alessandro Granelli

University of Bologna (UniBO) and INFN

- Post-doc at UniBO, with **Prof. S. Pascoli** on **neutrino physics** and **leptogenesis** (LG).
- Ph.D. at SISSA with **Prof. S. T. Petcov** on **LG**, with **Prof. P. Ullio** on **dark matter pheno** and **astrophysics**.
- Master in Padua (Italy), with Prof. F. D'Eramo on dark matter pheno.
- Lead Singer and Guitarist in the Italian Progressive Rock Band named **Tacita Intesa**, check it out on Spotify and YouTube...

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Theory and Phenomenology
of Fundamental Interactions
UNIVERSITY AND INFN · BOLOGNA

Testing LG with charged Lepton Flavour Violation (cLFV) searches

- Searches for $\ell \to e\gamma$, $\ell \to eee$ and $\mu \to e$ conversion in nuclei:
  - Current limits: $\mathrm{BR}(\mu \to e\gamma) < 4.2 \times 10^{-13}$ (MEG), $\mathrm{BR}(\mu \to eee) < 1.0 \times 10^{-12}$ (SINDRUM I), $\mathrm{CR}(\mu + {}^{48}_{22}\mathrm{Ti} \to e + {}^{48}_{22}\mathrm{Ti}) < 4.3 \times 10^{-12}$, $\mathrm{CR}(\mu + {}^{197}_{79}\mathrm{Au} \to e + {}^{197}_{79}\mathrm{Au}) < 7.0 \times 10^{-13}$ (SINDRUM II).
  - Planned sensitivities: $\mathrm{BR}(\mu \to e\gamma) \simeq 6 \times 10^{-14}$ (MEG II), $\mathrm{BR}(\mu \to eee) \simeq 10^{-15}$ (Mu3e), $\mathrm{CR}(\mu + {}^{27}_{79}\mathrm{Al} \to e + {}^{27}_{79}\mathrm{Al}) \simeq 6.0 \times 10^{-17}$ (Mu2e and COMET), $\mathrm{CR}(\mu + {}^{48}_{22}\mathrm{Ti} \to e + {}^{48}_{22}\mathrm{Ti}) \simeq 10^{-18}$ (PRISM/PRIME).
- Limits on the parameter space of low-scale LG with 3 quasi-degenerate HNLs:

- A. G., J. Klarić and S. T. Petcov (2206.04342), included in FIPs report (2305.01715). See also K. A. U. Calderón, I. Timiryasov and O. Ruchayskiy (2206.04540).

Testing LG with charged Lepton Flavour Violation (cLFV) searches

- Searches for $\mu \to e\gamma$, $\mu \to eee$ and $\mu \to e$ conversion in nuclei:
  - Current limits: BR($\mu \to e\gamma$) $< 4.2 \times 10^{-13}$ (MEG), BR($\mu \to eee$) $< 1.0 \times 10^{-12}$ (SINDRUM I), CR($^{48}_{22}\mathrm{Ti}\ \mu \to e\ ^{48}_{22}\mathrm{Ti}$) $< 4.3 \times 10^{-12}$, CR($^{197}_{79}\mathrm{Au}\ \mu \to e\ ^{197}_{79}\mathrm{Au}$) $< 7.0 \times 10^{-13}$ (SINDRUM II).
  - Planned sensitivities: BR($\mu \to e\gamma$) $\sim 6 \times 10^{-14}$ (MEG II), BR($\mu \to eee$) $\sim 10^{-15}$ (Mu3e), CR($^{27}_{79}\mathrm{Al}\ \mu \to e\ ^{27}_{79}\mathrm{Al}$) $\sim 6.0 \times 10^{-17}$ (Mu2e and COMET), CR($^{48}_{22}\mathrm{Ti}\ \mu \to e\ ^{48}_{22}\mathrm{Ti}$) $\sim 10^{-18}$ (PRISM/PRIME).
- Limits on the parameter space of low-scale LG with 3 quasi-degenerate HNLs:

- A. G., J. Klarić and S. T. Petcov (2206.04342), included in FIPs report (2305.01715). See also K. A. U. Calderón, I. Timiryasov and O. Ruchayskiy (2206.04540).

Live in Tokyo, October 2019

Thanks for your attention!