High Energy Physics Phenomenology

Prof. Dr. Alberto Mariotti

email: *alberto.Mariotti@vub.be*

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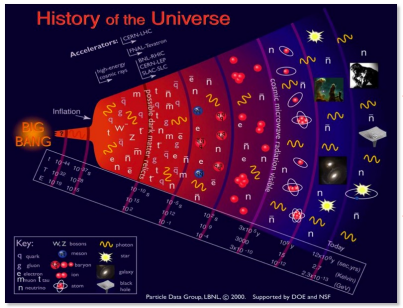
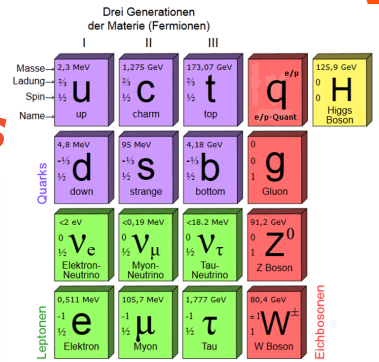
Where do we stand in HEP?



✦*Standard Model of Particle Physics*

✦*Standard Model of Cosmology*



Many fundamental questions still open…

Force Unification ?

String Theory ?

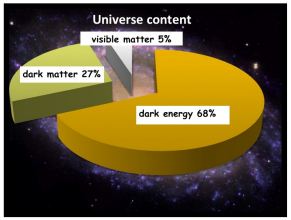
Quantum Gravity ?

Inflation ?

Hierarchy problem ?

Dark matter?

Matter-Antimatter ?



Physics Beyond the Standard Model (BSM)

What is the experimental signatures?

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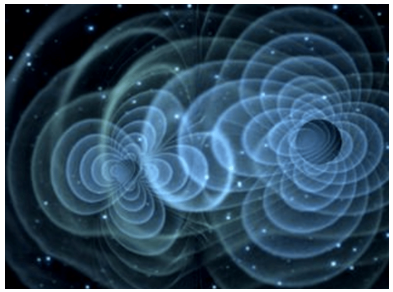
Research Lines

✦*BSM physics at colliders*

- Model building on dark matter physics and axions
- Unconventional signatures at the LHC (e.g. displaced vertices)
- Future colliders (FCC, muon collider ...)

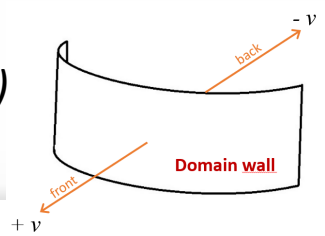
✦*Gravitational waves*

- Focus on Stochastic Gravitational Wave background (SGWB)
- Data analysis to detect astrophysical SGWB (BH and NS mergers)
- Modelling of cosmological SGWB to explore early stages of Universe, Phase transitions and cosmological defects
- Members of LIGO-Virgo-Kagra and Einstein Telescope



E.G. 2023 Master Thesis

- *Superconducting Domain Walls and GW (R. Camphyn 2023)*



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