

# PARTICLE THEORY

School of Physics and Astronomy, Monash University

## Quantum Chromodynamics



- Understand the physics of high-energy particle collisions at the LHC
- Develop detailed models of physical processes and use Markov-Chain Monte Carlo methods to sample the (quantum) probability distributions
- Contribute to one of the most important computer programs in physics!
- Speak to Peter Skands

## Flavour physics

- Investigate the origin of flavour in the Standard Model
- Link flavour to grand unification of forces
- Speak to German Valencia



Illustration: © Johan Jarnestad/The Royal Swedish Academy of Sciences

## Speak to German Valencia

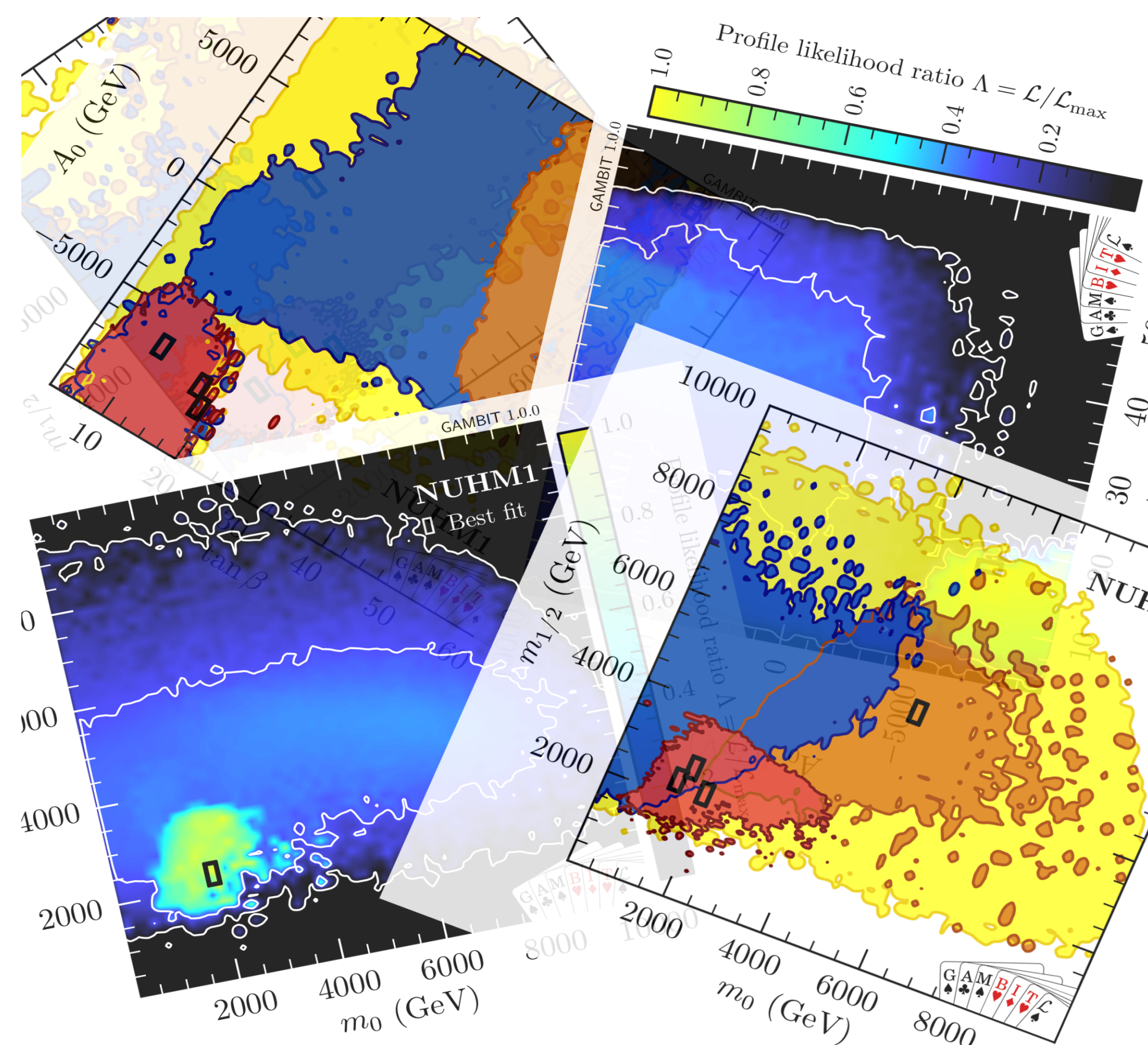
- Study of Flavour Anomalies and rare decays
- Properties of the Higgs boson
- Effective field theories

## Speak to Peter Skands

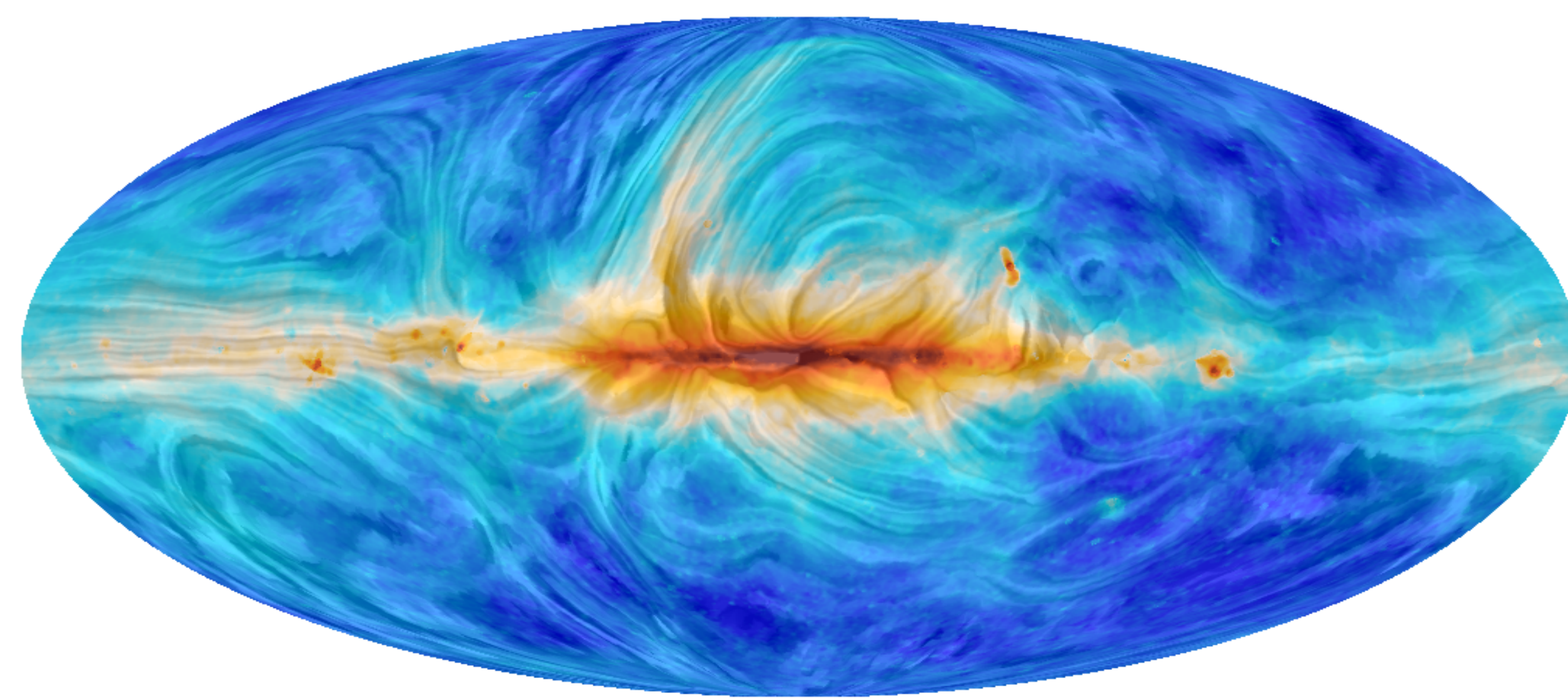
- “Virtual Colliders”: Monte Carlo simulations of high-energy processes
- Confronting theory and experiment at the Large Hadron Collider
- Physics of “jets”: radiation patterns of interacting high-energy particles
- Colour strings: Hadronisation in Quantum Chromodynamics

## Particle phenomenology

- Discover which models are compatible with the latest data
- Study beyond the Standard Model physics
- Investigate its signatures in dark matter and LHC experiments
- Speak to Csaba Balázs, Peter Skands or German Valencia



## Particle cosmology



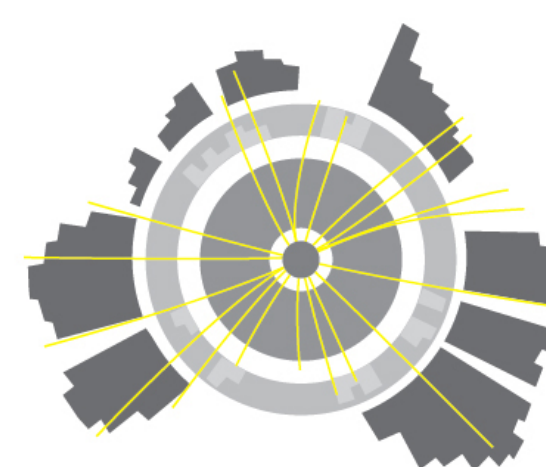
- Investigate the origin of cosmological matter-antimatter asymmetry
- Model symmetry breaking and gravitational waves in the early Universe
- Study aspects of the dark Universe: dark matter, dark forces, dark energy
- Speak to Csaba Balázs

## Speak to Csaba Balázs

- Cosmology of electroweak, and other fundamental, symmetry breaking
- Supersymmetric origin of matter probed by gravitational waves
- Extra dimensional and other models of dark matter

## For more information, please contact:

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Particle Physics at the Terascale

