Theory, observation & cosmological inference

Introduction to KICC: 5 minutes on Will Handley's research

Will Handley
<wh260@cam.ac.uk>

Royal Society University Research Fellow & Turing Fellow
Astrophysics Group, Cavendish Laboratory, University of Cambridge
Kavli Institute for Cosmology, Cambridge
Gonville & Caius College
willhandley.co.uk/talks

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Research overview

Theory

- Early universe cosmology
- Modified gravity

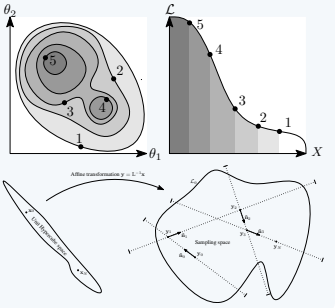
Inference

- Nested sampling
- Likelihood free inference

Observation

- REACH
- GAMBIT

PolyChord



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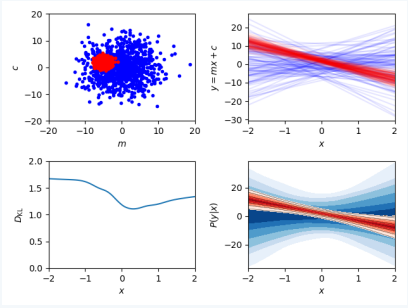
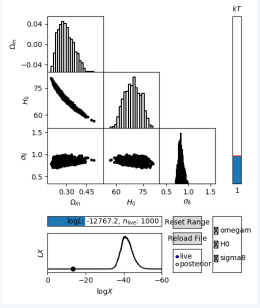


anesthetic



Coming soon: `unimpeded`, `supernest`

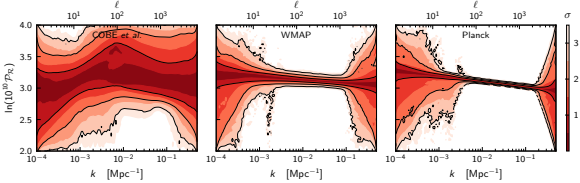
Theory of the primordial and late-time universe

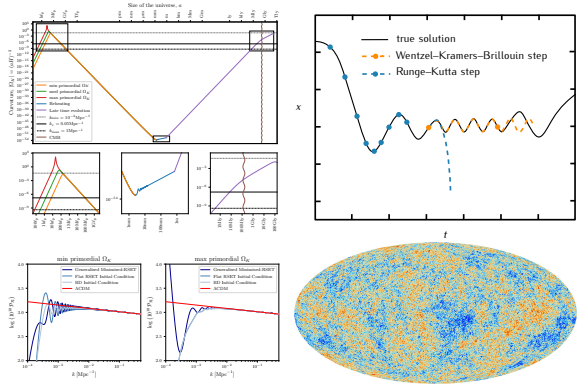
Metha Prathaban (PhD1)
Palindromic & two-sheeted universes – boundary conditions & Boltzmann solvers.

Wei-Ning Deng (PhD1)
Primordial curvature & comoving curvature perturbations $\mathcal{R}$.

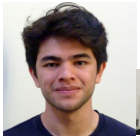
Sinah Legner (PhD1) 
Predictions & perturbations from gravitational gauge-theories.

Danielle Dineen (MPhil)
Israel junction conditions and potential-independent predictions from inflation.

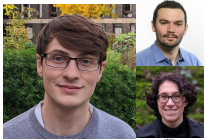




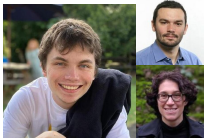
Observation: REACH & GAMBIT



Ian Roque (PhD4)
Bayesian radiometer calibration for the REACH radio telescope.

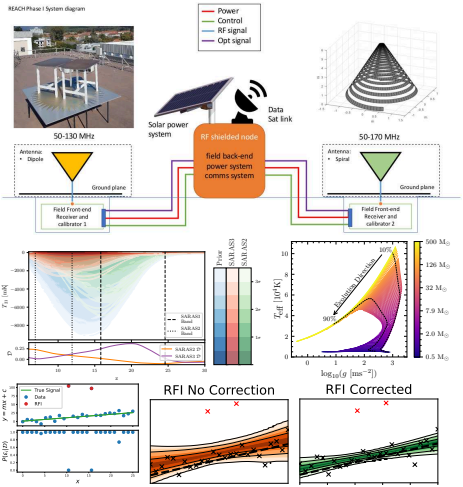


Thomas Gessey-Jones (PhD3)
REACH 21cm universe theory: Pop III stars & cosmic rays.



Harry Bevins (PhD4)
21cm data analysis and machine learning: `margarine`, `maxsmooth` & `globalemu`.

Sam Leeney (MPhil)
Bayesian RFI excision for REACH and pulsars.



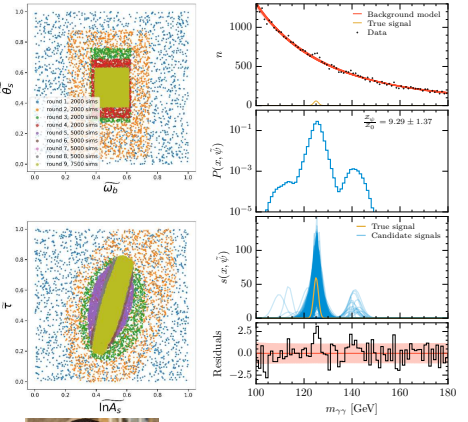
Inference: Nested sampling and Bayesian machine learning

Adam Ormondroyd (PhD2)
Cosmic history reconstructions, clustering in nested sampling.

Kilian Scheutwinkel (PhD2)
Likelihood-free inference and nested sampling

George Carter (PhD3)
Bayesian global sky modelling

Sahibzada Allahyar (MPhil)
High-precision nested sampling, gravitational wave astrometry.



David Yallup (PostDoc)
Bayesian Neural Nets, sparse reconstruction, & Gaussian Processes