

Inflation and primordial signals of new physics

One of the main directions at DAMTP / the CTC:

*Using the **early Universe** to uncover **new fundamental physics***

Inflation and primordial signals of new physics

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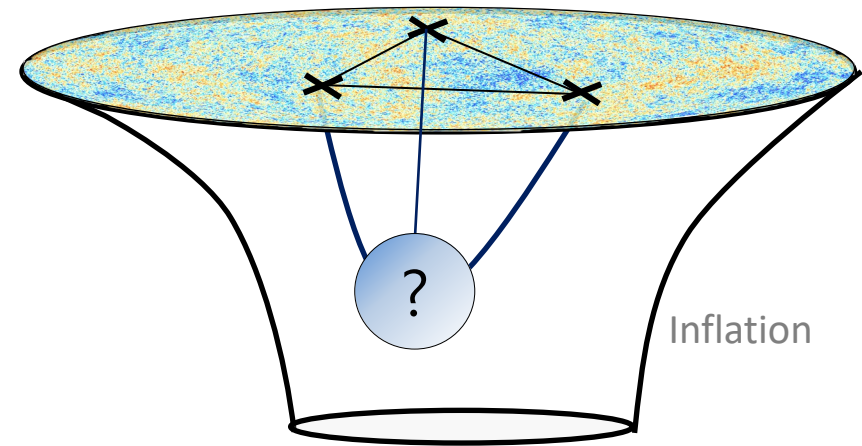
*Using the **early Universe** to uncover **new fundamental physics***

The early Universe is characterised by:

- Rapidly expanding spacetime background
- Very high energy scales ($\sim 10^{13}$ TeV)
- Particle production

Perfect laboratory for studying:

- QFT on curved spacetime
- Gravity at high energies
- New physics beyond Standard Model



Inflation and primordial signals of new physics



Enrico Pajer



Carlos Duaso-Pueyo
(postdoc)



Dong Gang Wang
(postdoc)



Harry Goodhew
(PhD student)



Mang Hei Gordon Lee
(PhD student)



Santiago Aguei-Salcedo
(PhD student)



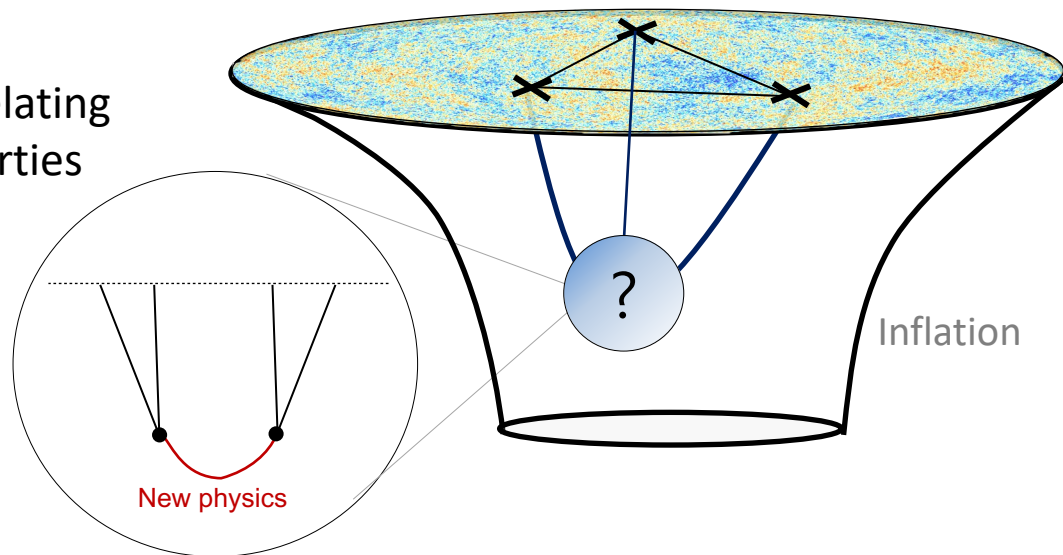
Ciaran McCulloch
(PhD student)

Explores theoretical techniques for relating **primordial non-Gaussianity** to properties of **new inflationary physics**

QFT on curved backgrounds



Correlation functions



Inflation and primordial signals of new physics



Blake Sherwin



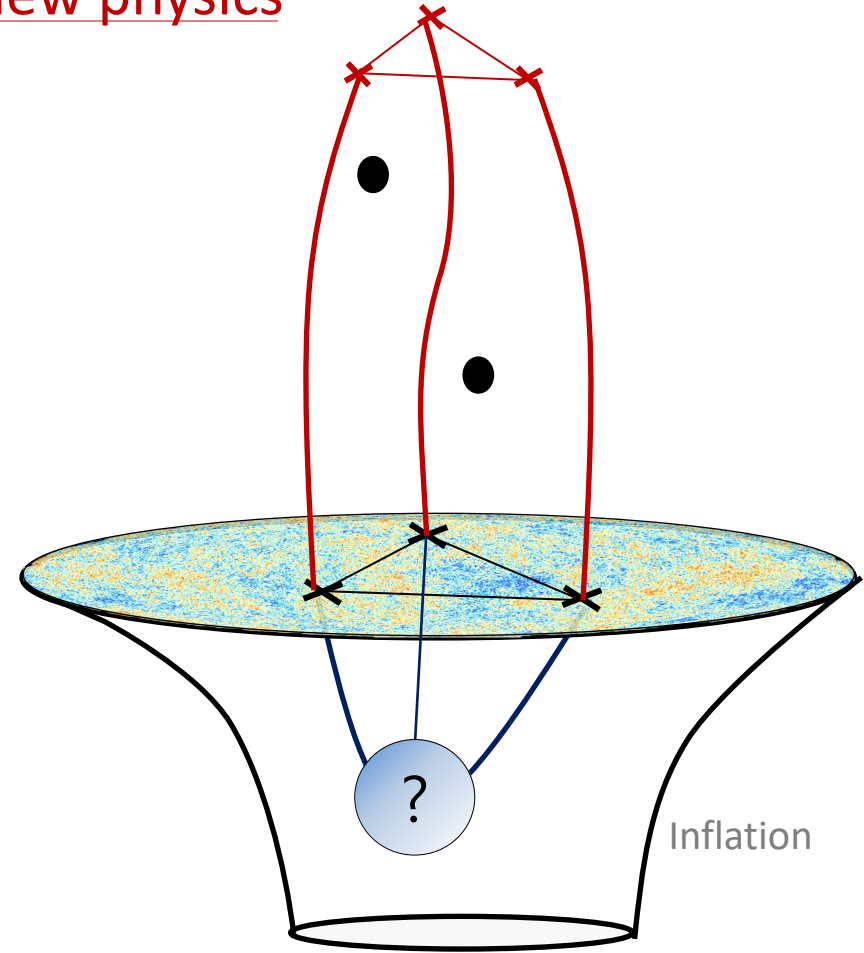
Irene Cabezas
(PhD student)



Gerrit Farren
(PhD student)

Research interests across
CMB and **large-scale structure**

Particular focus on measurements
of the **gravitational lensing** of the CMB



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Paul Shellard



Amelia Drew
(JRF)



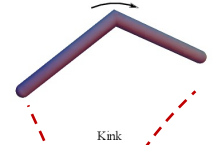
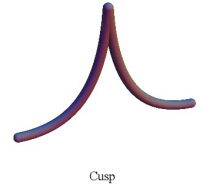
Ericka Florio
(PhD student)



David Baker
(PhD student)

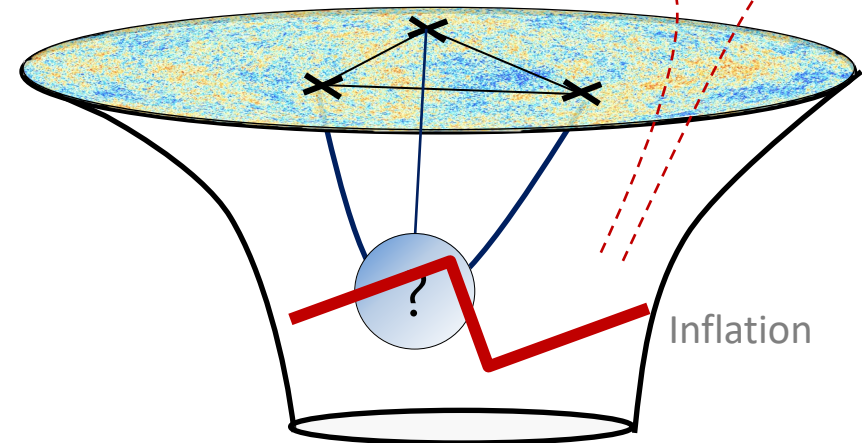


Yoann Launay
(PhD student)



Use **primordial fluctuations** and **large-scale structure formation**
To constrain early Universe theories

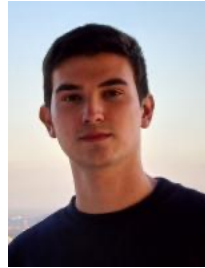
One focus is **cosmic strings** / **axions**
produced by a **phase transition**



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James Fergusson



Petar Suman
(PhD student)

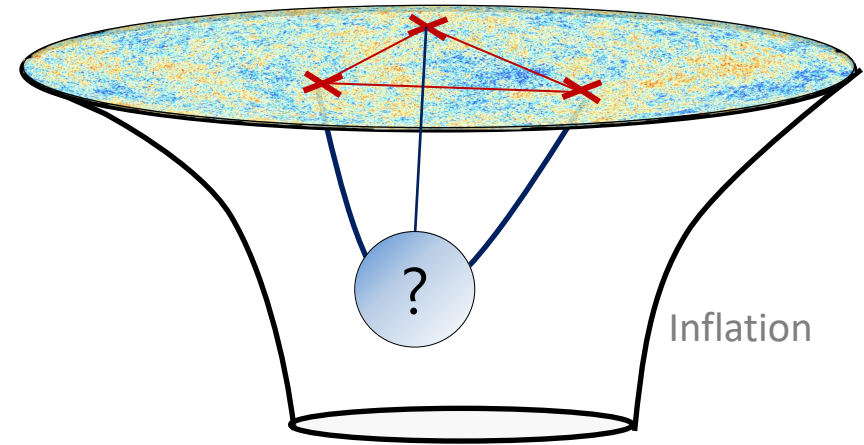


David Baker
(PhD student)

Director of the CDT in Data Intensive Science

Searches for **primordial non-Gaussianity**

In particular the **bispectrum**
in the CMB / LSS



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Scott Melville



Santiago
Aguei-Salcedo
(PhD student)

UKRI Hawking Fellow (until 2025)

Import amplitude techniques from
particle physics into **cosmology**

The use (and misuse) of
effective field theories

