

Creating synthetic observations for a next-generation sub-millimetre telescope

Masters research project offered by UiO, in collaboration with the UK
Astronomy Technology Centre, Royal Observatory Edinburgh

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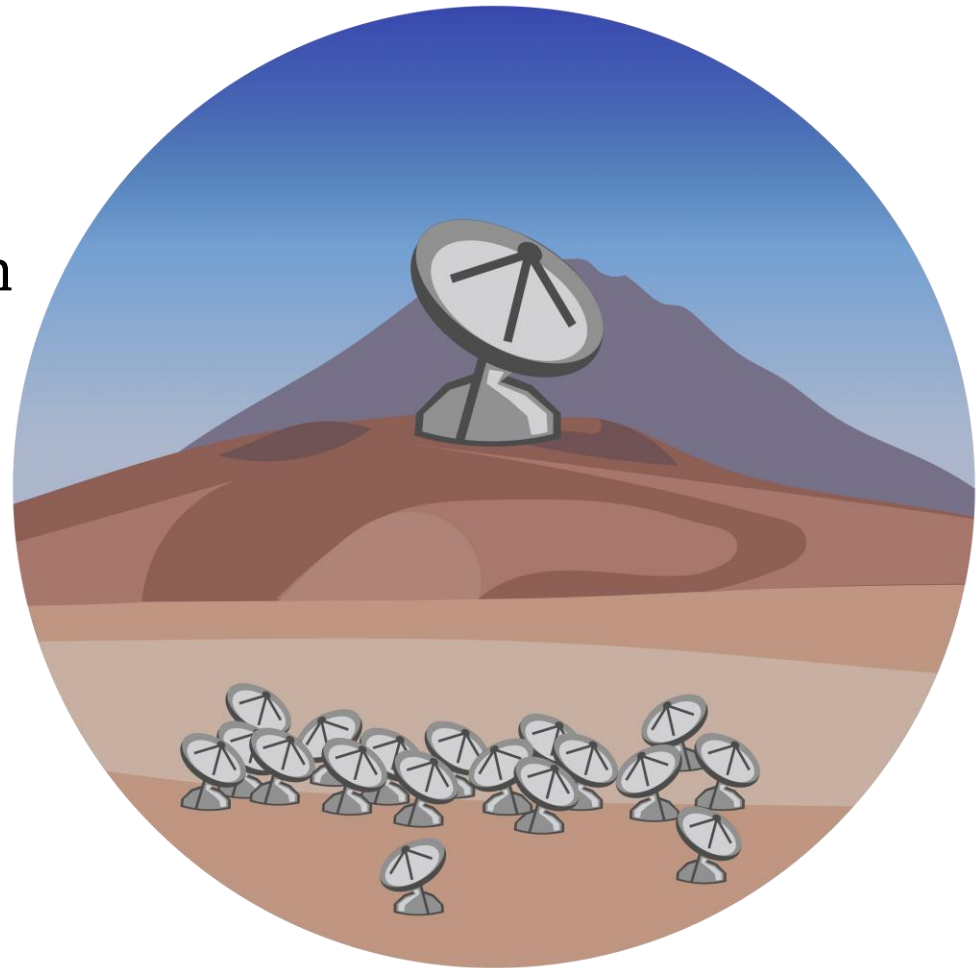
Science and
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Project outline

- Overall goal: use state-of-the-art cosmological simulations to investigate star formation in galaxies
- Put constraints on next-generation instrumentation required for this science!
 - Technical literature review on cosmological simulations and sub-millimetre telescopes
 - Investigate subject of interest to be explored with simulations
 - Develop an example instrument setup for chosen observations
 - Simulate instrument using sensitivity calculator in Python and create synthetic observations
 - Analyse results

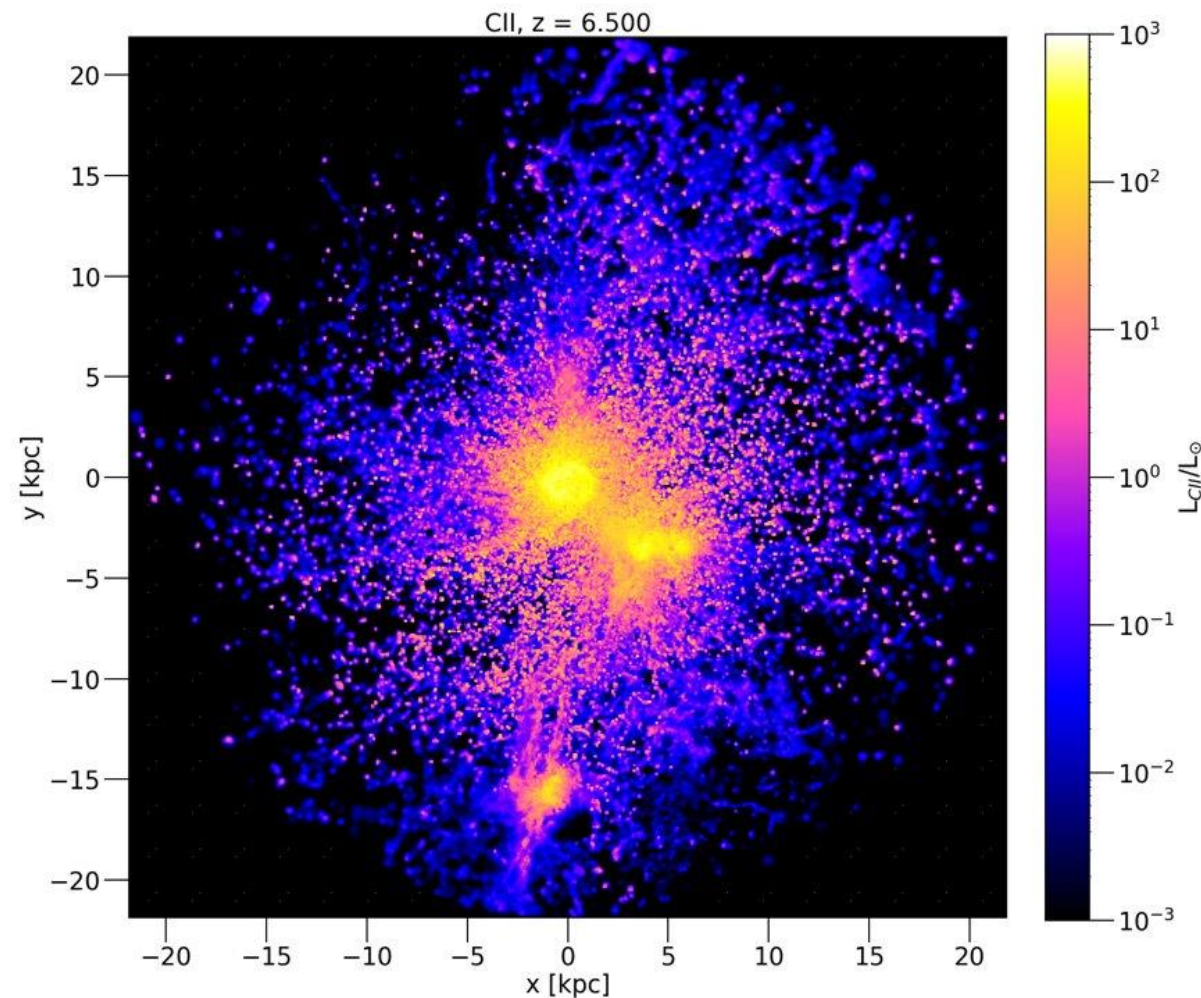
The AtLAST telescope

- 3 year design study
- International collaboration (UiO, UK ATC, ESO...)
- All aspects of science & technology to build a 50m single dish sub-millimetre telescope in the Atacama desert in Chile, in the 2030s
- Will allow us to observe a very large area of sky – FoV 2 degrees
- 50 m dish = much higher resolution & sensitivity than existing facilities: transformational science results!



The simulations

- Ponos
 - Zoom-in simulations of individual galaxies
 - Project would be to investigate the large-scale, diffuse emission from cold gas in the circumgalactic medium: the source of fuel for star formation in galaxies



The simulations

- Simba
 - Large volume cosmological simulation of the Universe at high redshift
 - Project would be to investigate the properties of highly star-forming, extremely dusty galaxies, that are thought to be the progenitors of massive elliptical galaxies in the nearby universe

