Power spectrum of the Cosmic Microwave Background radiation

Balázs Pál[1]

[1]Eötvös Loránd University

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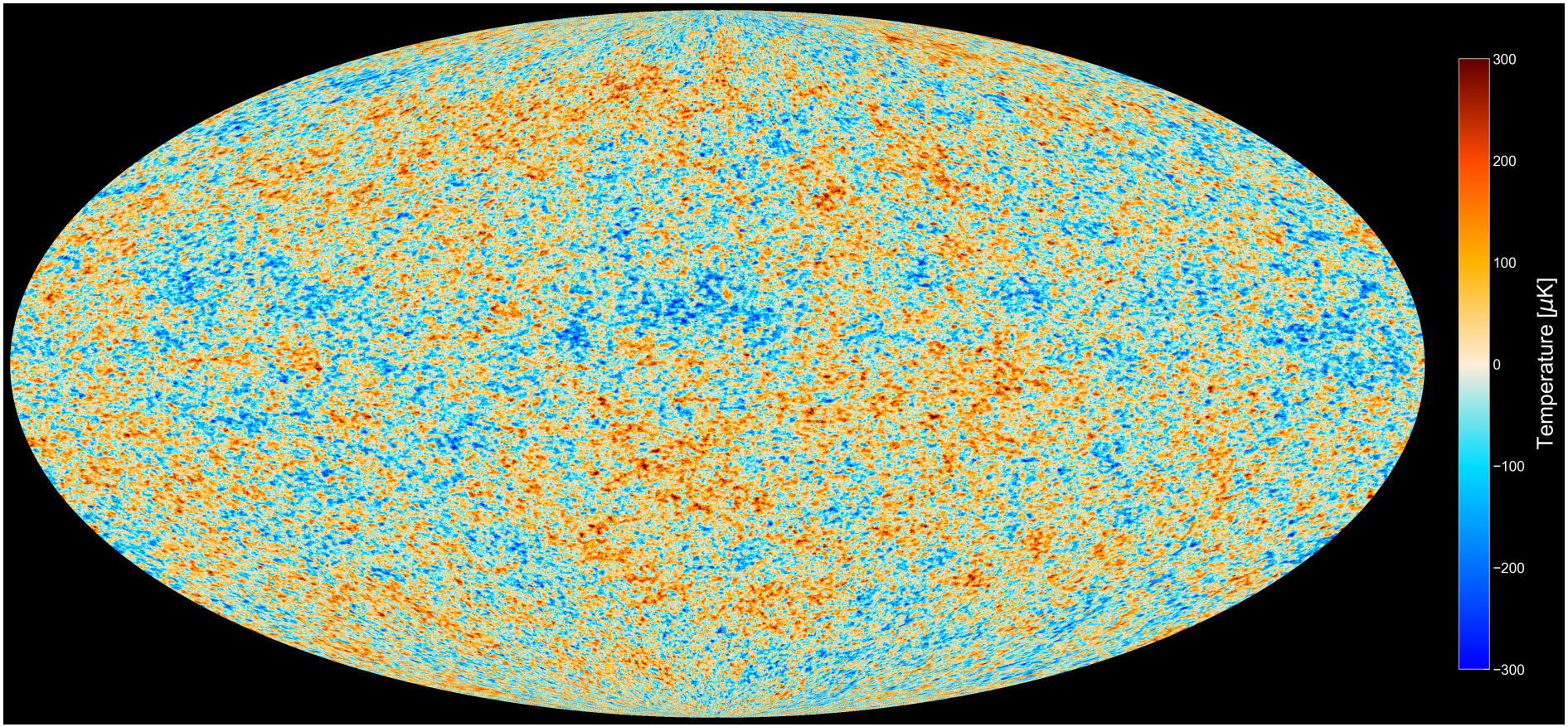
300
200
100
0
−100
−200
−300
Temperature [μK]

Theoretical considerations

- Black-body radiation with average colour temperature of $2.725\ \mathrm{K}$ and excessive redshift ($z = 1100$)
  - Recombination period ($\approx 370\,000$ years after the Big Bang)
  - Mean free path of photons increases by an imponderable extent (decoupling of photons)

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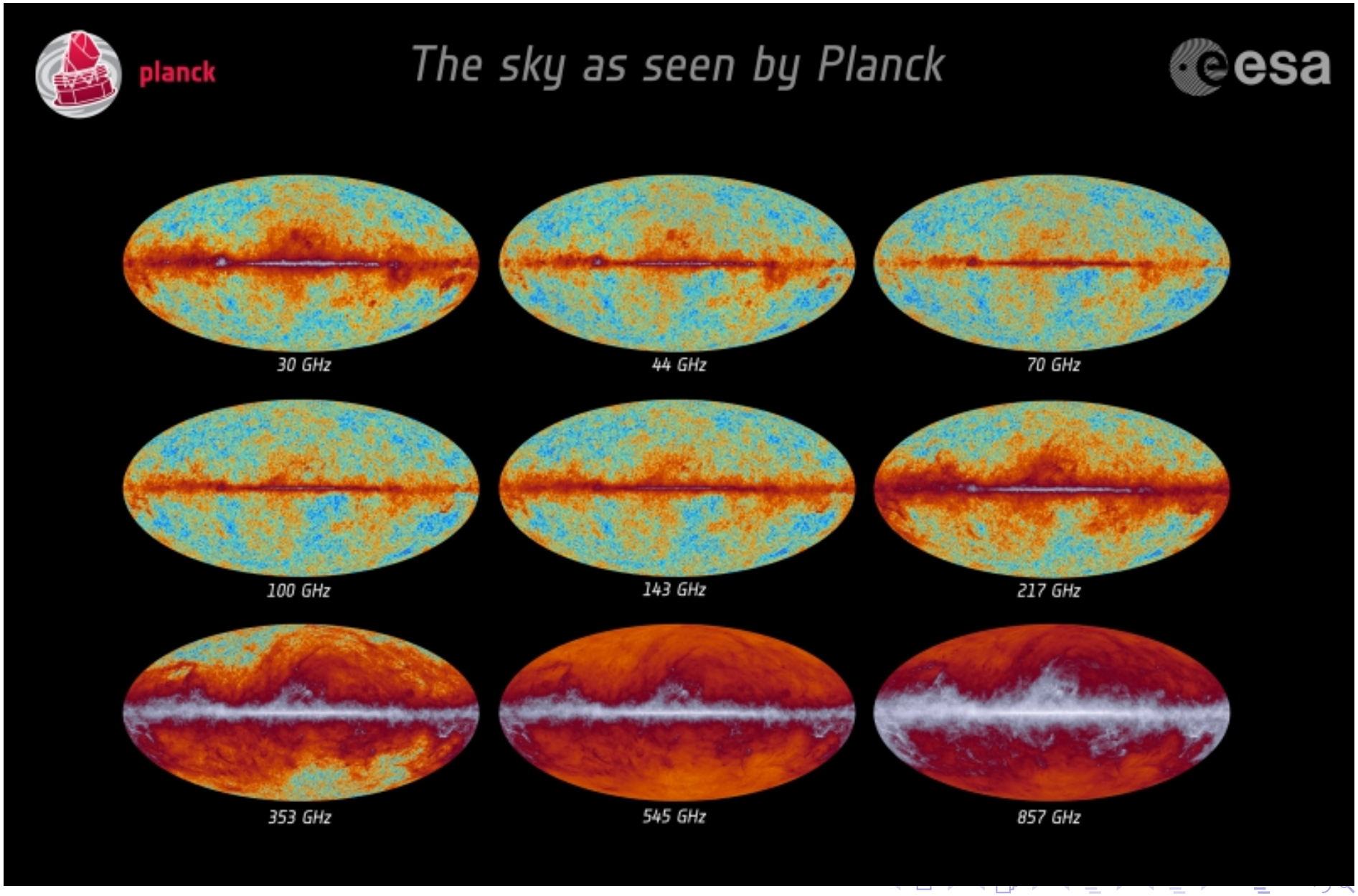
- A lot of superimposed effects on each other in the CMB also
  - Effects due to the movement of Sun and Earth
  - Point sources, Sunyev-Zeldovich effect
  - Lensing effects
  - $\vdots$

Theoretical considerations



Project goals

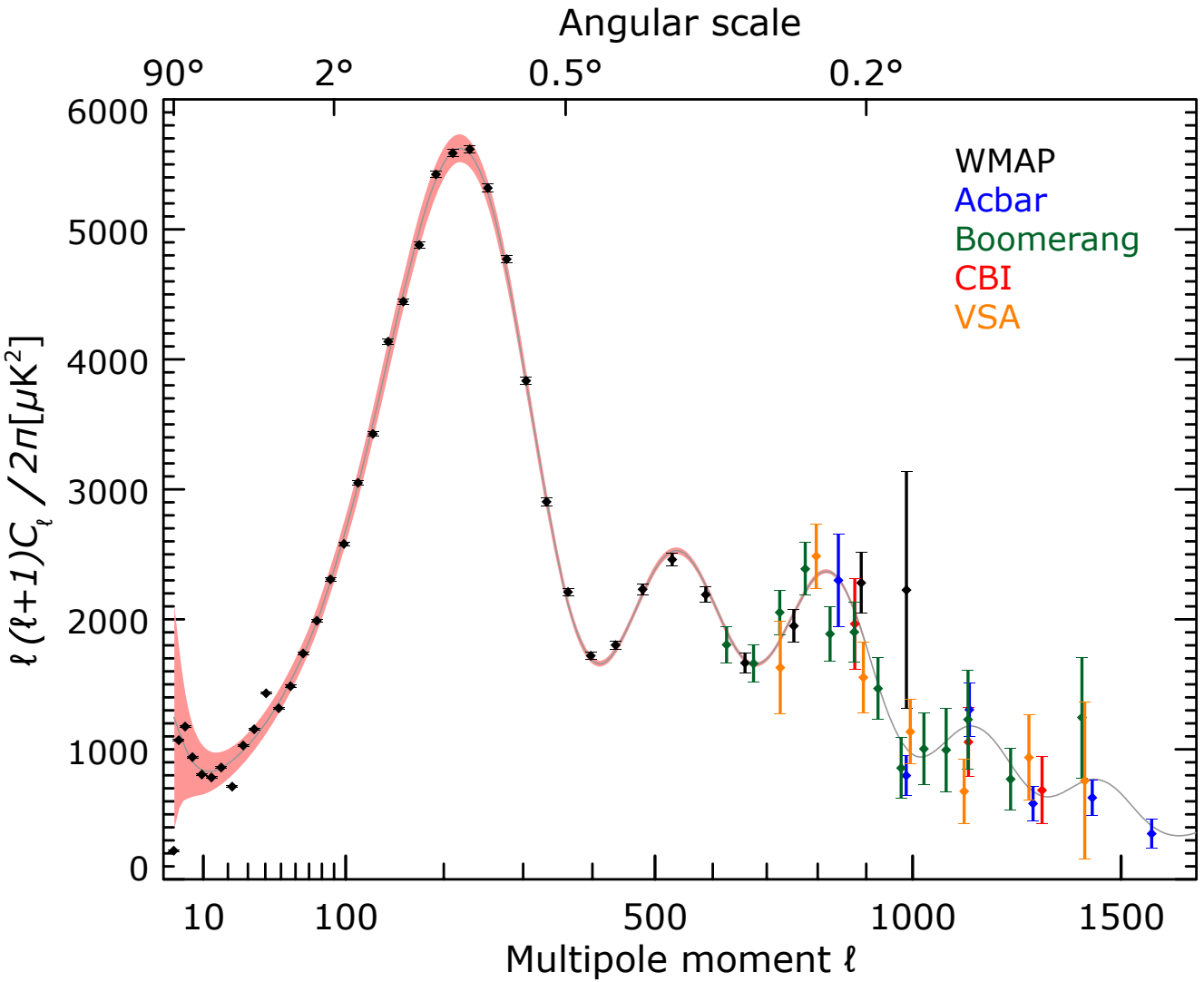
Simulation

- Simulate map of the CMB
- Explore spectra of generated map
- Simulate noise from different effects

Analysis of measurements

- Reverse engineer power spectrum
- Filter noise as much as possible
- Estimate cosmological parameters

Power spectrum of CMB



Real Planck CMB map