

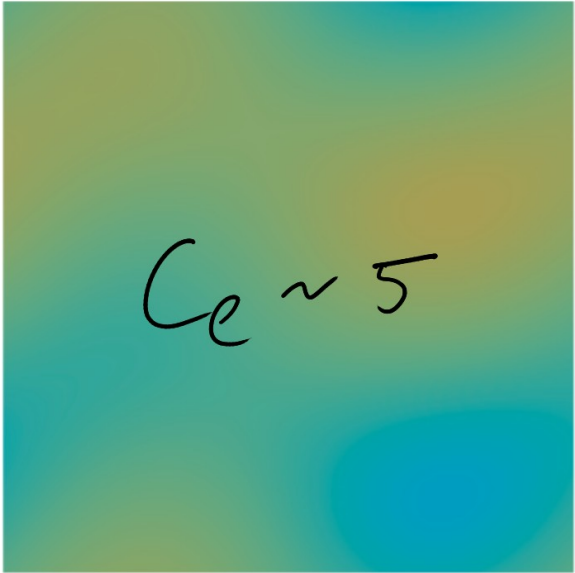
Theoretical Cosmology

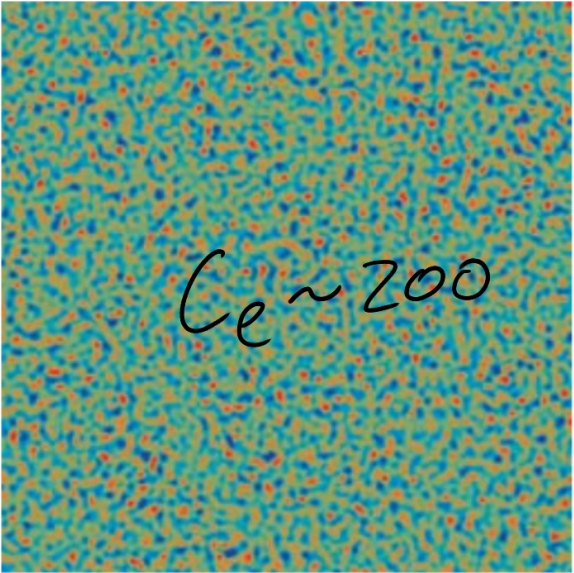
Lecture course – Sommersemester 2023

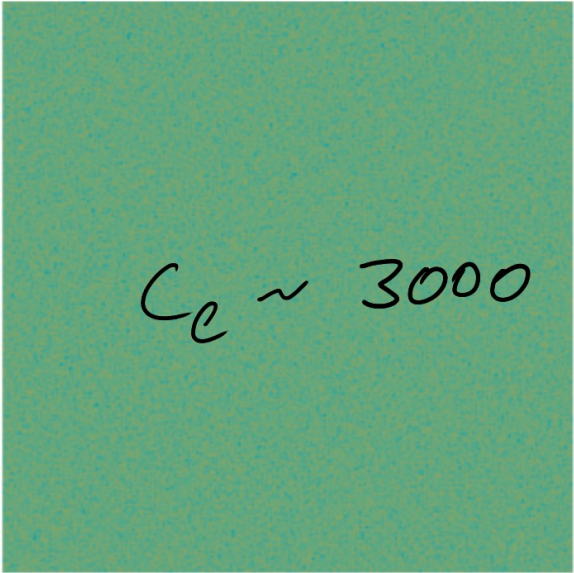


Felix Kahlhoefer
TTP - KIT

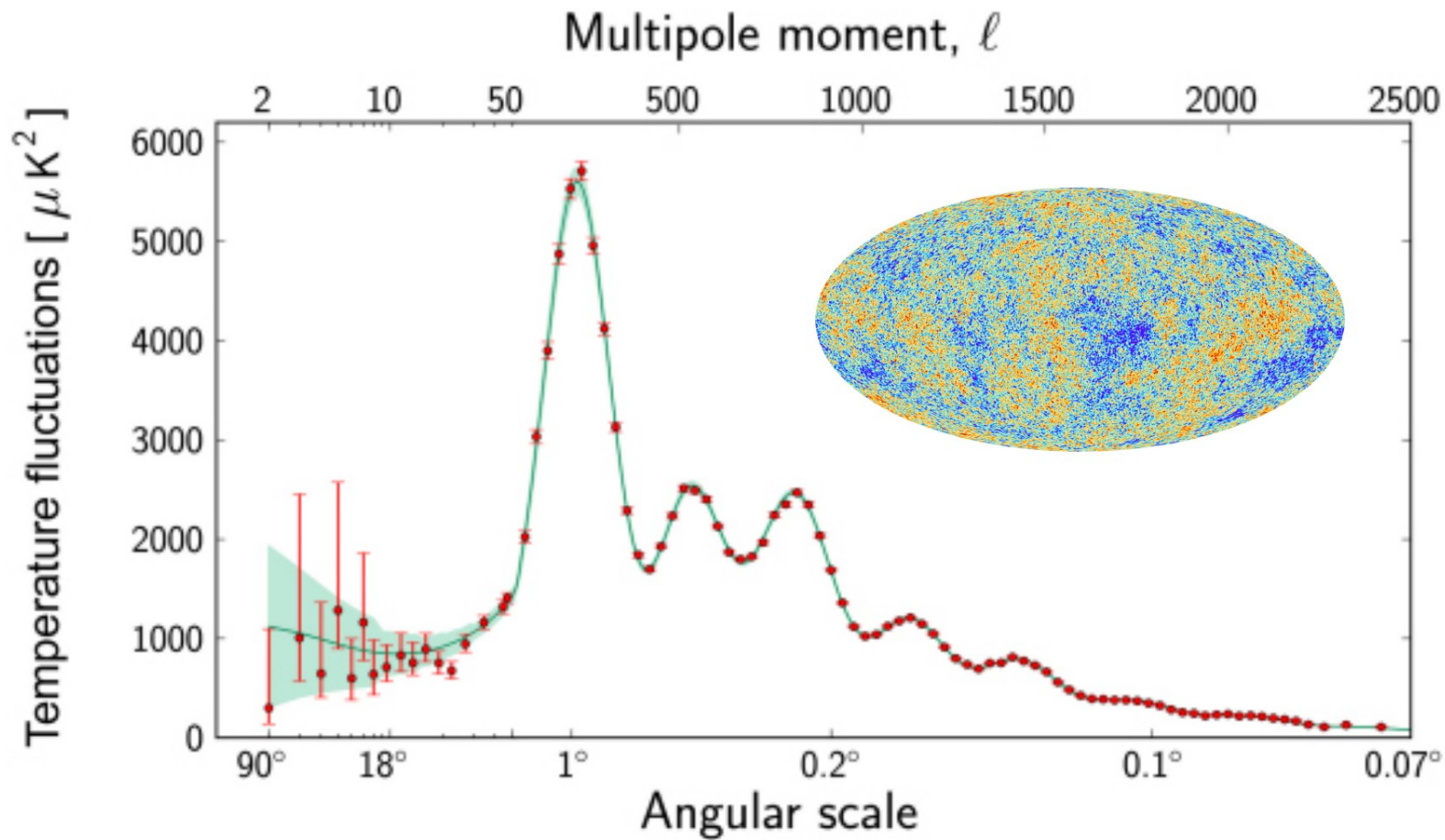
CMB multipoles


$$C_\ell \sim 5$$

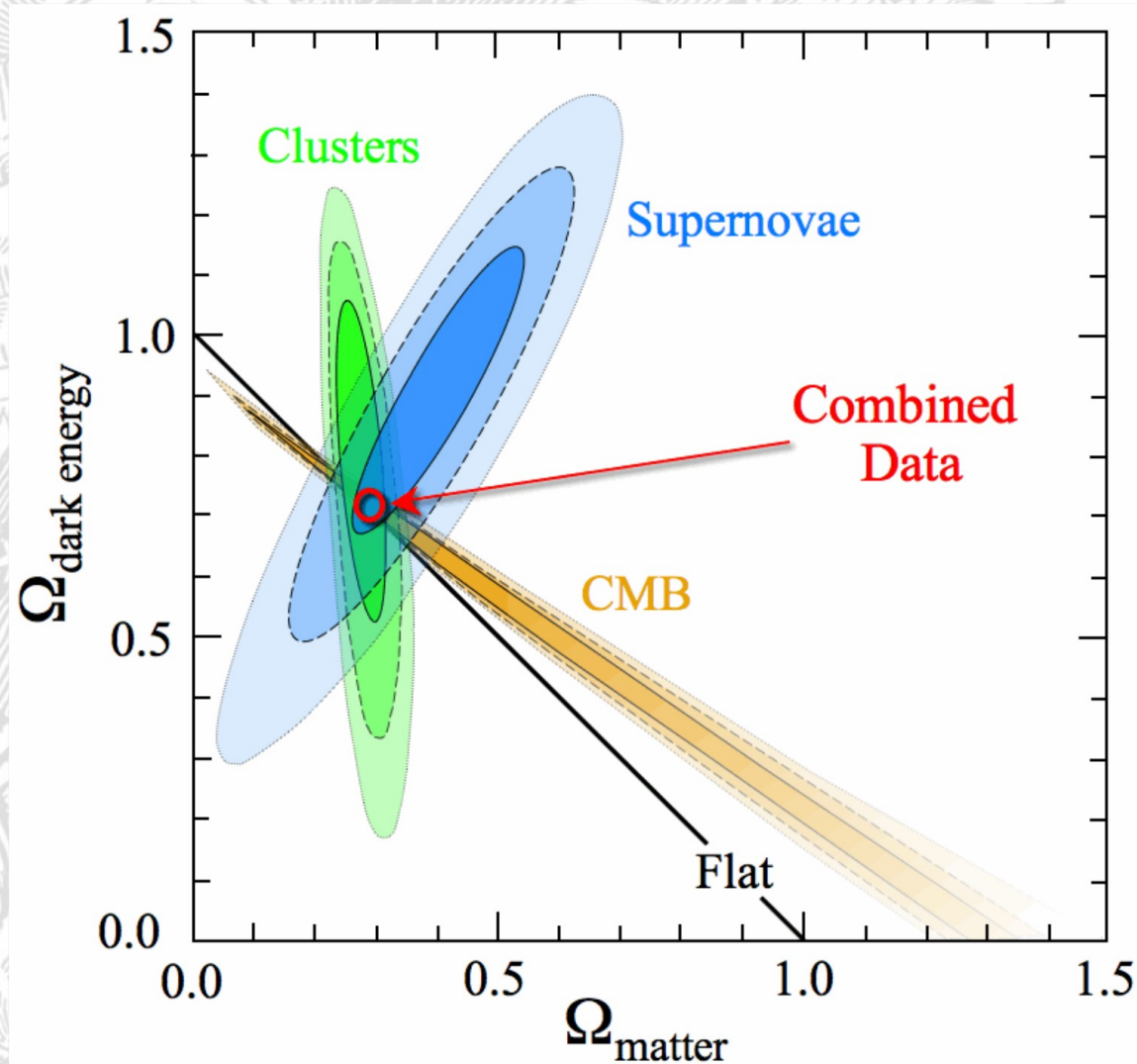

$$C_\ell \sim 200$$


$$C_\ell \sim 3000$$

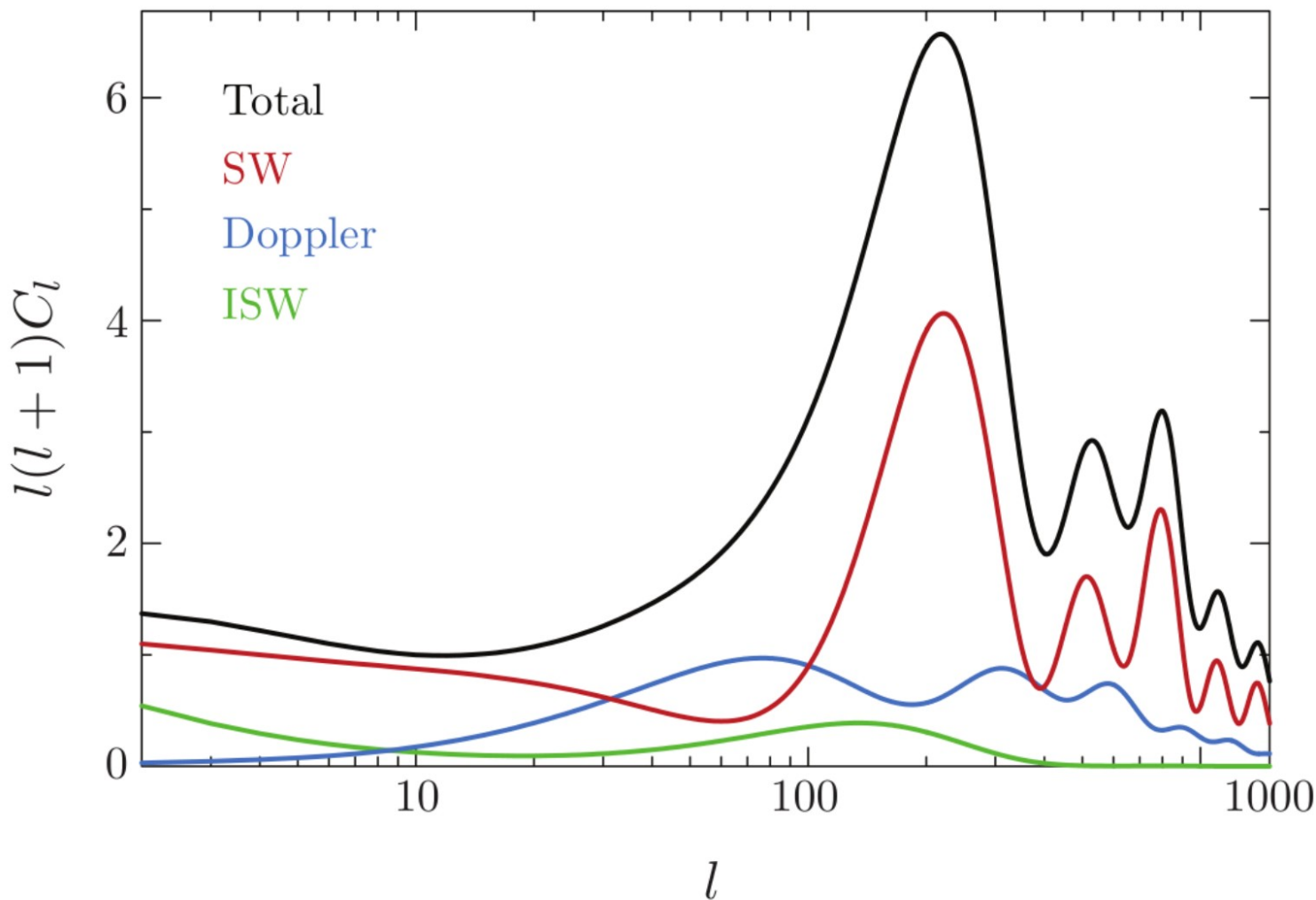
Angular power spectrum



Cosmological concordance



Prediction of CMB multipoles



Planck measurements

Parameter	Plik best fit	Plik [1]	CamSpec [2]	([2] - [1])/σ ₁	Combined
Ω _b h ²	0.022383	0.02237 ± 0.00015	0.02229 ± 0.00015	-0.5	0.02233 ± 0.00015
Ω _c h ²	0.12011	0.1200 ± 0.0012	0.1197 ± 0.0012	-0.3	0.1198 ± 0.0012
100θ _{MC}	1.040909	1.04092 ± 0.00031	1.04087 ± 0.00031	-0.2	1.04089 ± 0.00031
τ	0.0543	0.0544 ± 0.0073	0.0536 ^{+0.0069} _{-0.0077}	-0.1	0.0540 ± 0.0074
ln(10 ¹⁰ A _s)	3.0448	3.044 ± 0.014	3.041 ± 0.015	-0.3	3.043 ± 0.014
n _s	0.96605	0.9649 ± 0.0042	0.9656 ± 0.0042	+0.2	0.9652 ± 0.0042
Ω _m h ²	0.14314	0.1430 ± 0.0011	0.1426 ± 0.0011	-0.3	0.1428 ± 0.0011
H ₀ [km s ⁻¹ Mpc ⁻¹] ...	67.32	67.36 ± 0.54	67.39 ± 0.54	+0.1	67.37 ± 0.54
Ω _m	0.3158	0.3153 ± 0.0073	0.3142 ± 0.0074	-0.2	0.3147 ± 0.0074
Age [Gyr]	13.7971	13.797 ± 0.023	13.805 ± 0.023	+0.4	13.801 ± 0.024
σ ₈	0.8120	0.8111 ± 0.0060	0.8091 ± 0.0060	-0.3	0.8101 ± 0.0061
S ₈ ≡ σ ₈ (Ω _m /0.3) ^{0.5} ..	0.8331	0.832 ± 0.013	0.828 ± 0.013	-0.3	0.830 ± 0.013
z _{re}	7.68	7.67 ± 0.73	7.61 ± 0.75	-0.1	7.64 ± 0.74
100θ*	1.041085	1.04110 ± 0.00031	1.04106 ± 0.00031	-0.1	1.04108 ± 0.00031
r _{drag} [Mpc]	147.049	147.09 ± 0.26	147.26 ± 0.28	+0.6	147.18 ± 0.29