

HET LAATSTE NIEUWS VAN HET OUDSTE LICHT

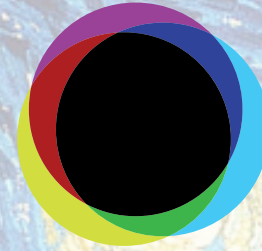
DE STATUS VAN KOSMOLOGISCHE INFLATIE



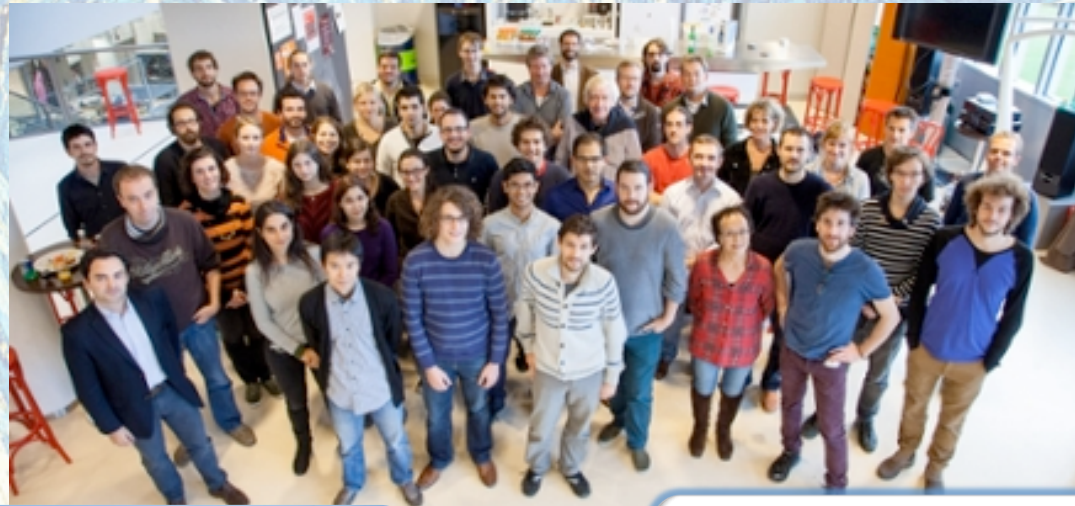
**Jan Pieter
van der Schaar**

GRAPPA

x
x
x
x



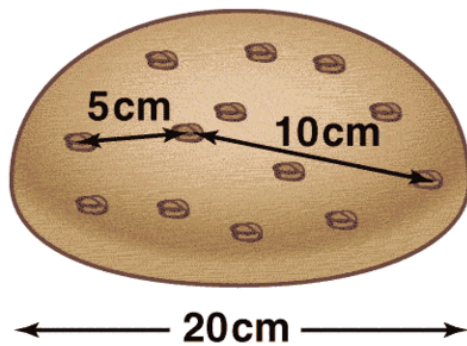
GRavitation AstroParticle Physics Amsterdam



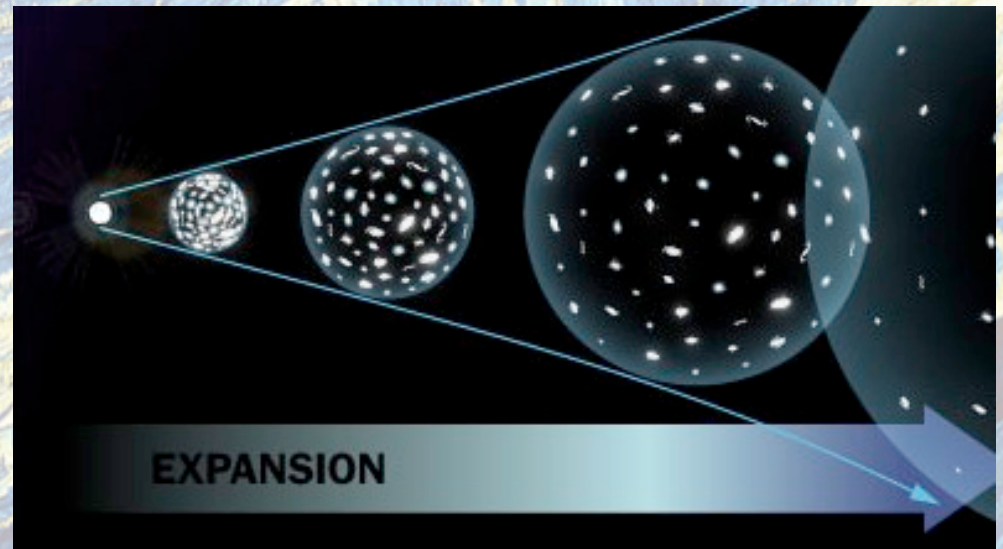
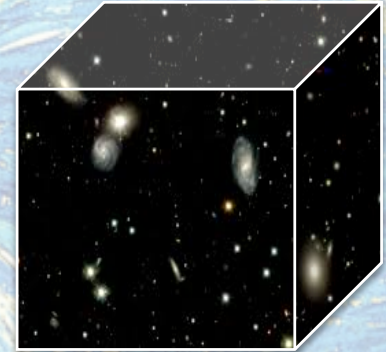
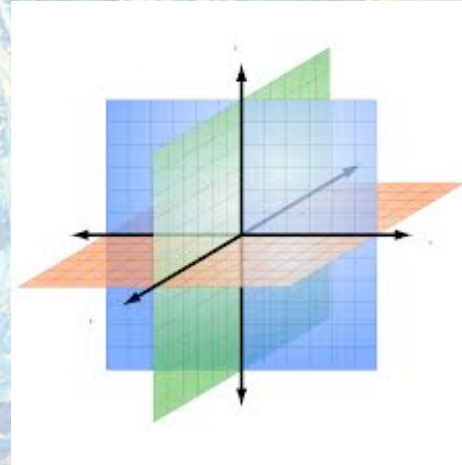


<http://wmap.gsfc.nasa.gov/media/030657/index.html>

EEN UITDIJEND HEELAL



MAP990404

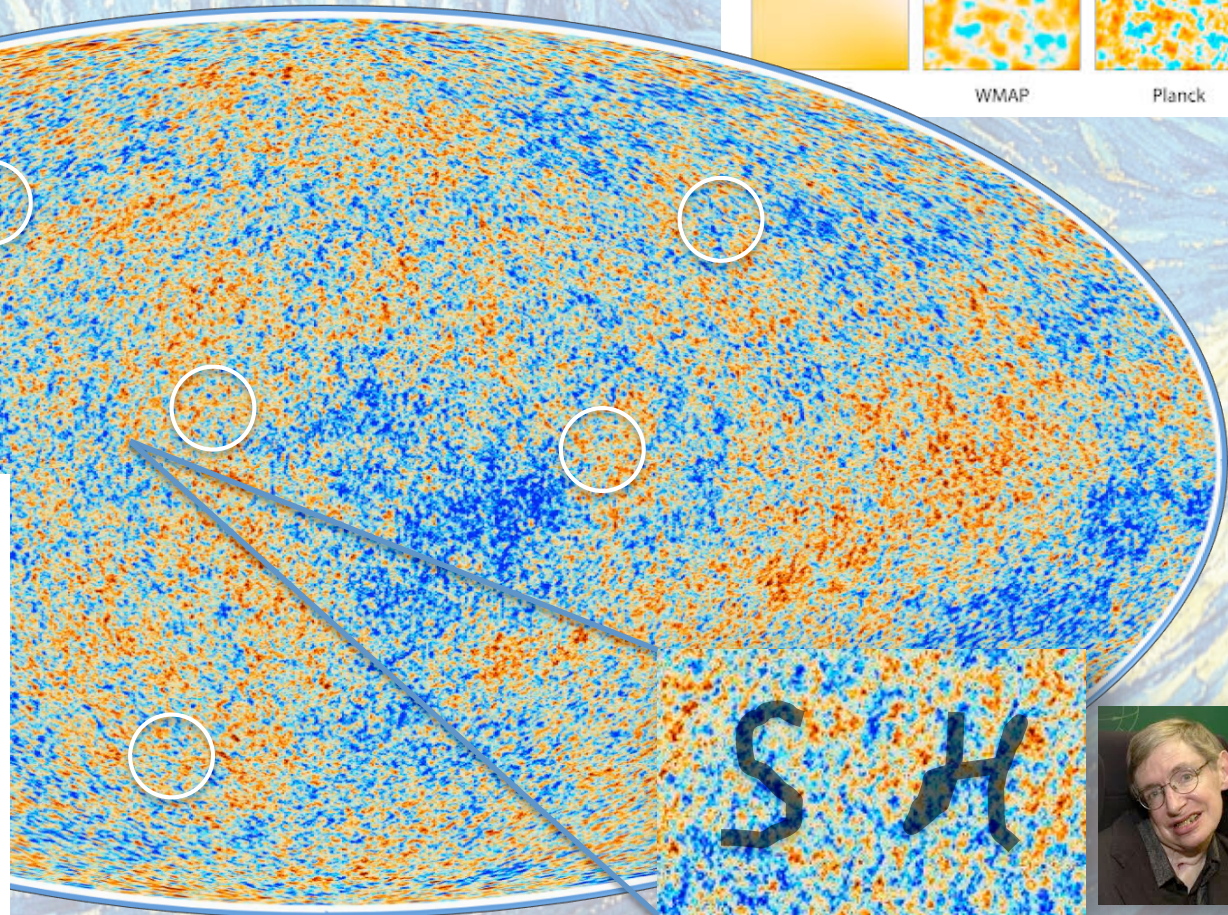
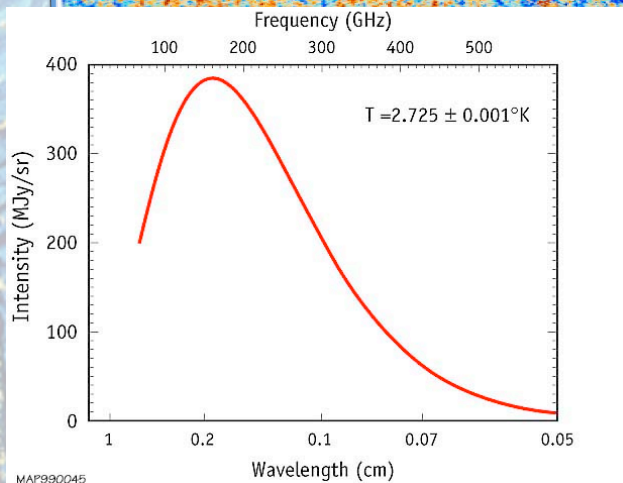
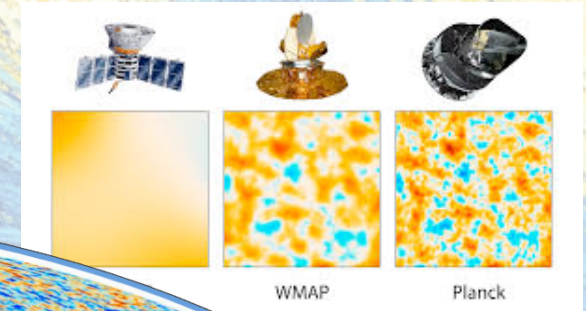
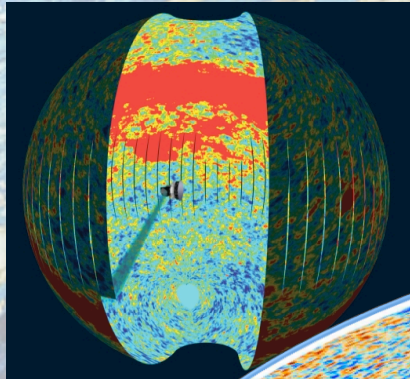


STRUCTUUR OP GROTE SCHAAAL

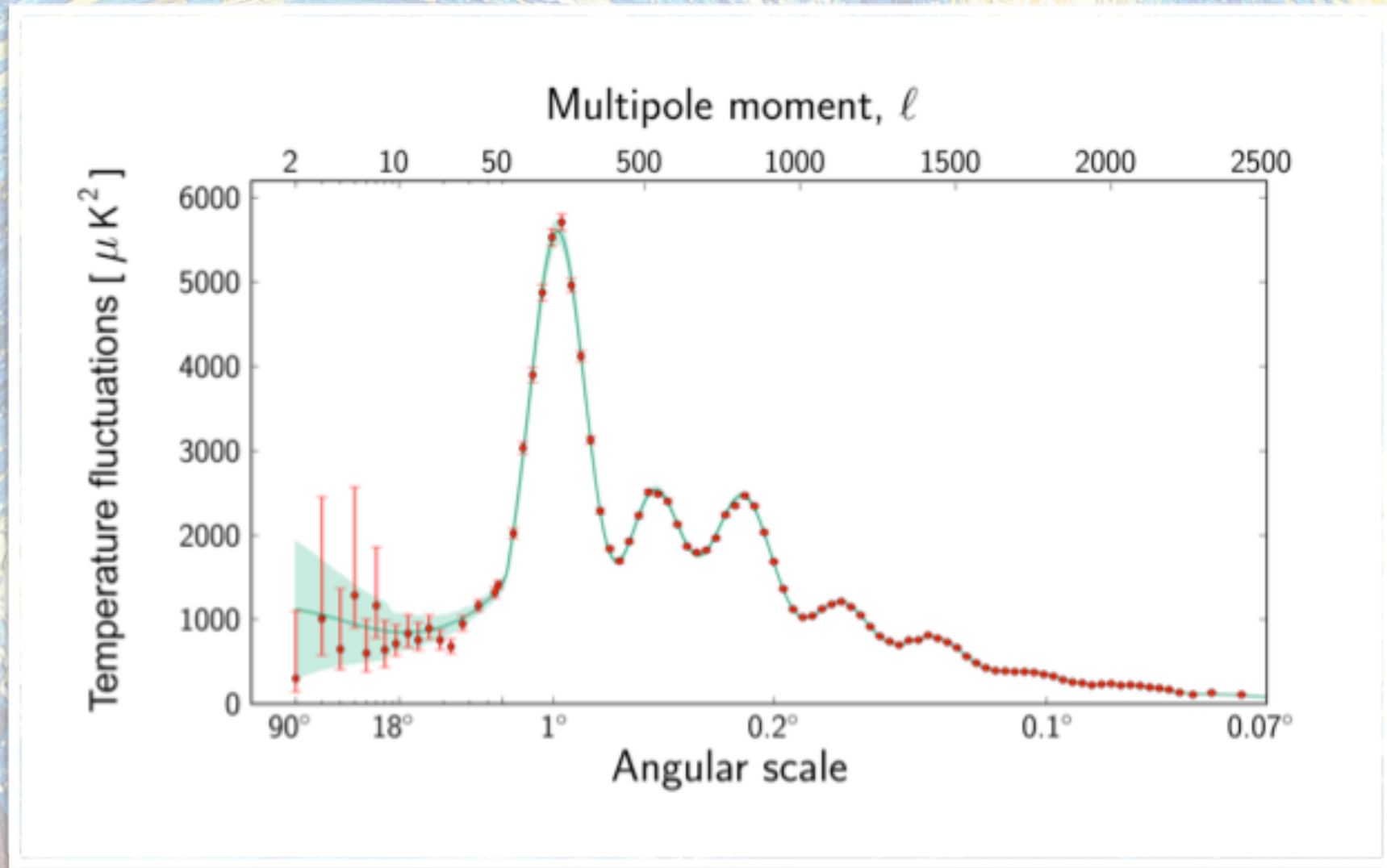
<http://astro.uchicago.edu/cosmus/projects/sloanmovie/>

NAGLOED VAN DE OERKNAL

2,725 KELVIN, $Z=1000$
 $\Delta T/T = 1/100.000$

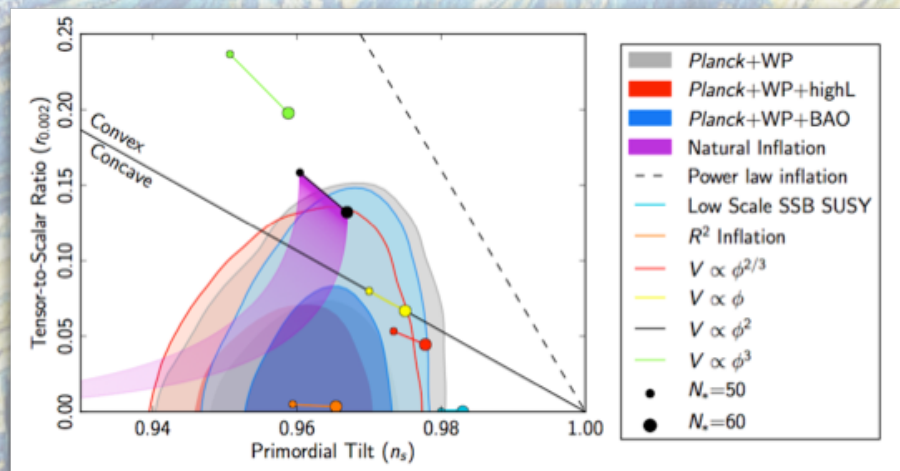
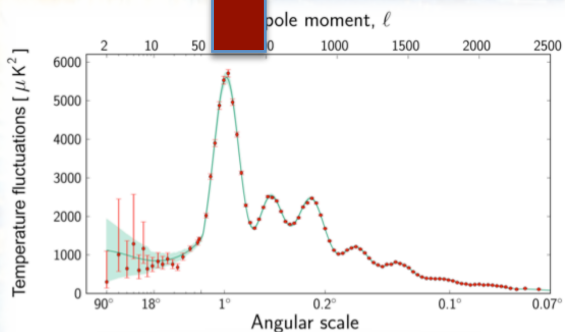
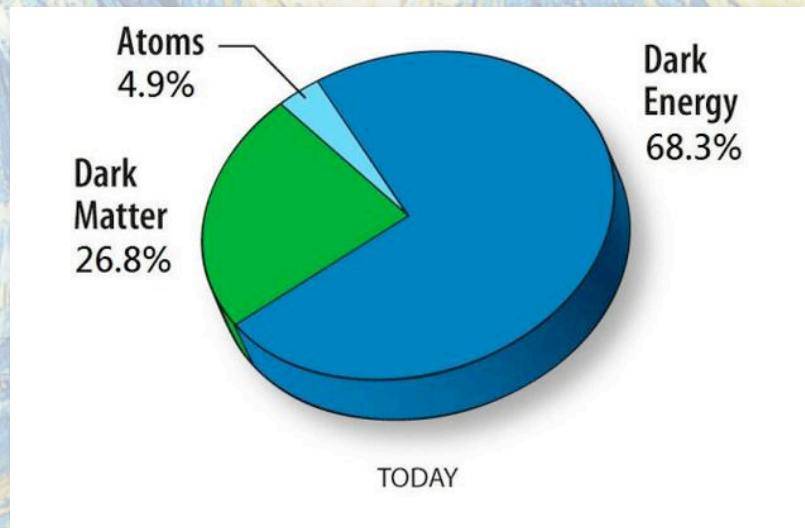


PRECISIE KOSMOLOGIE

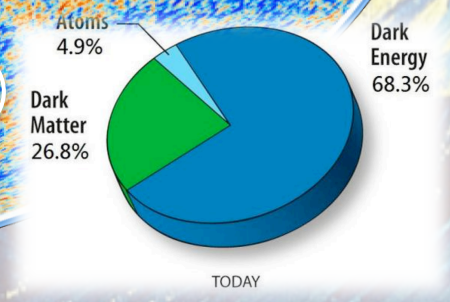
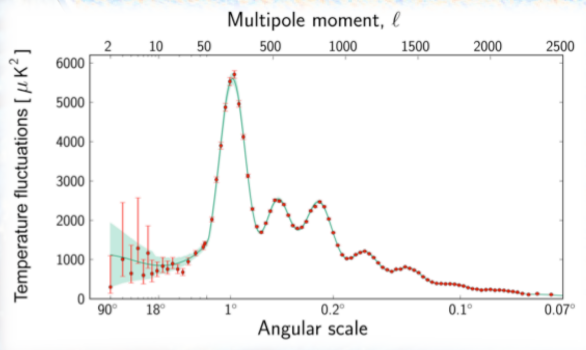
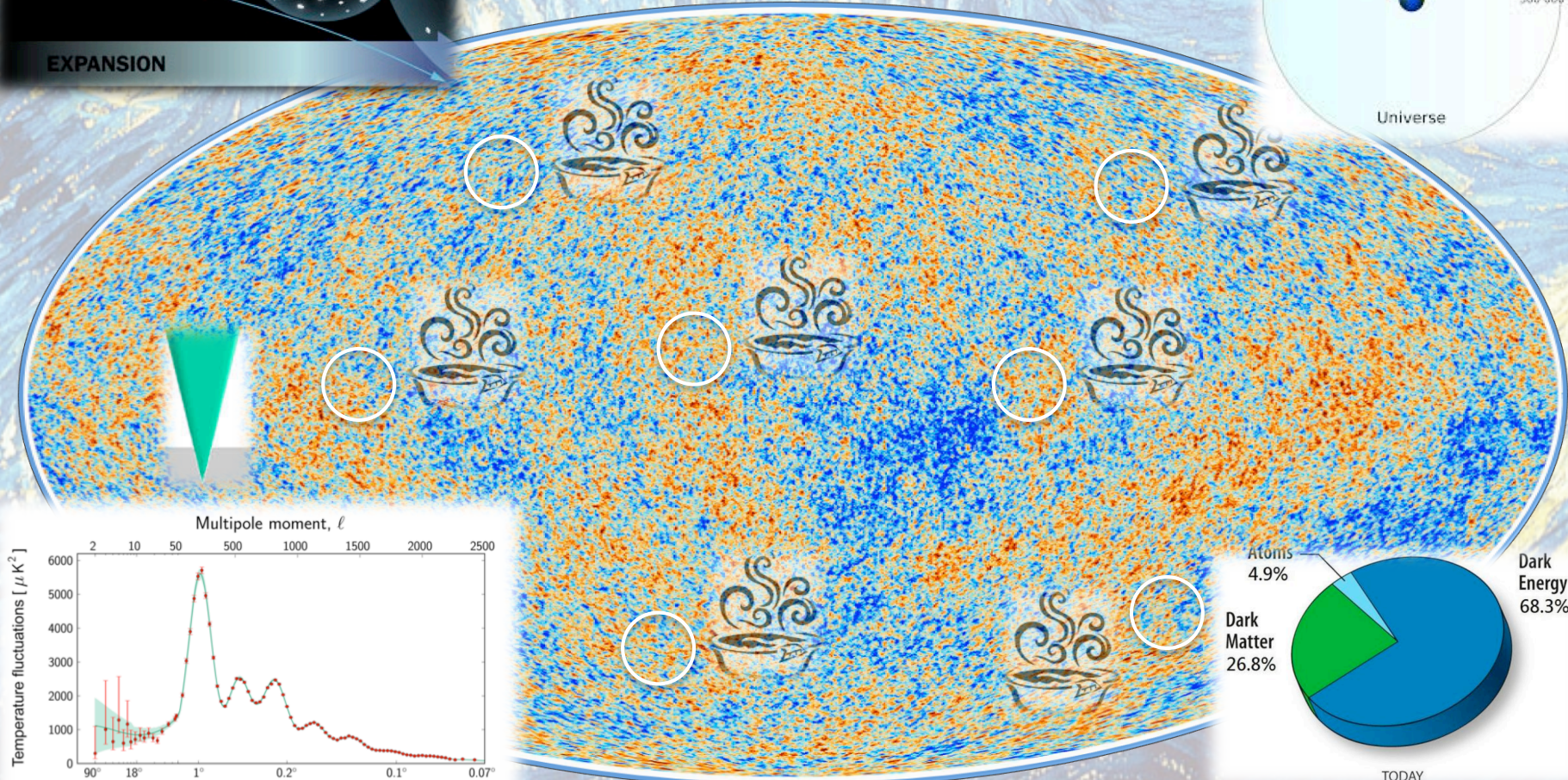
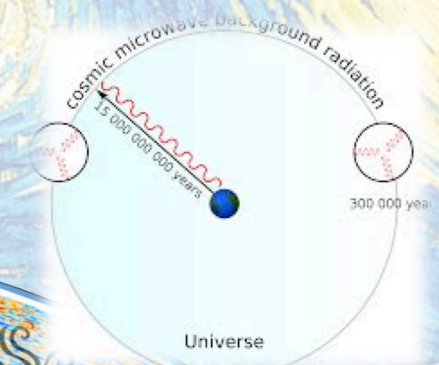
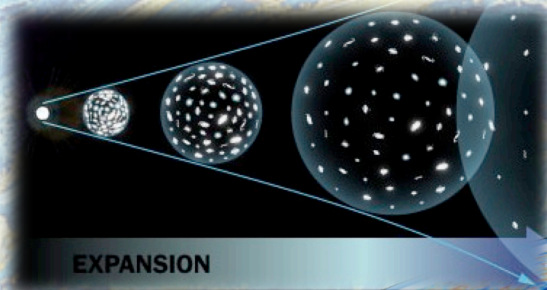


RESULTATEN

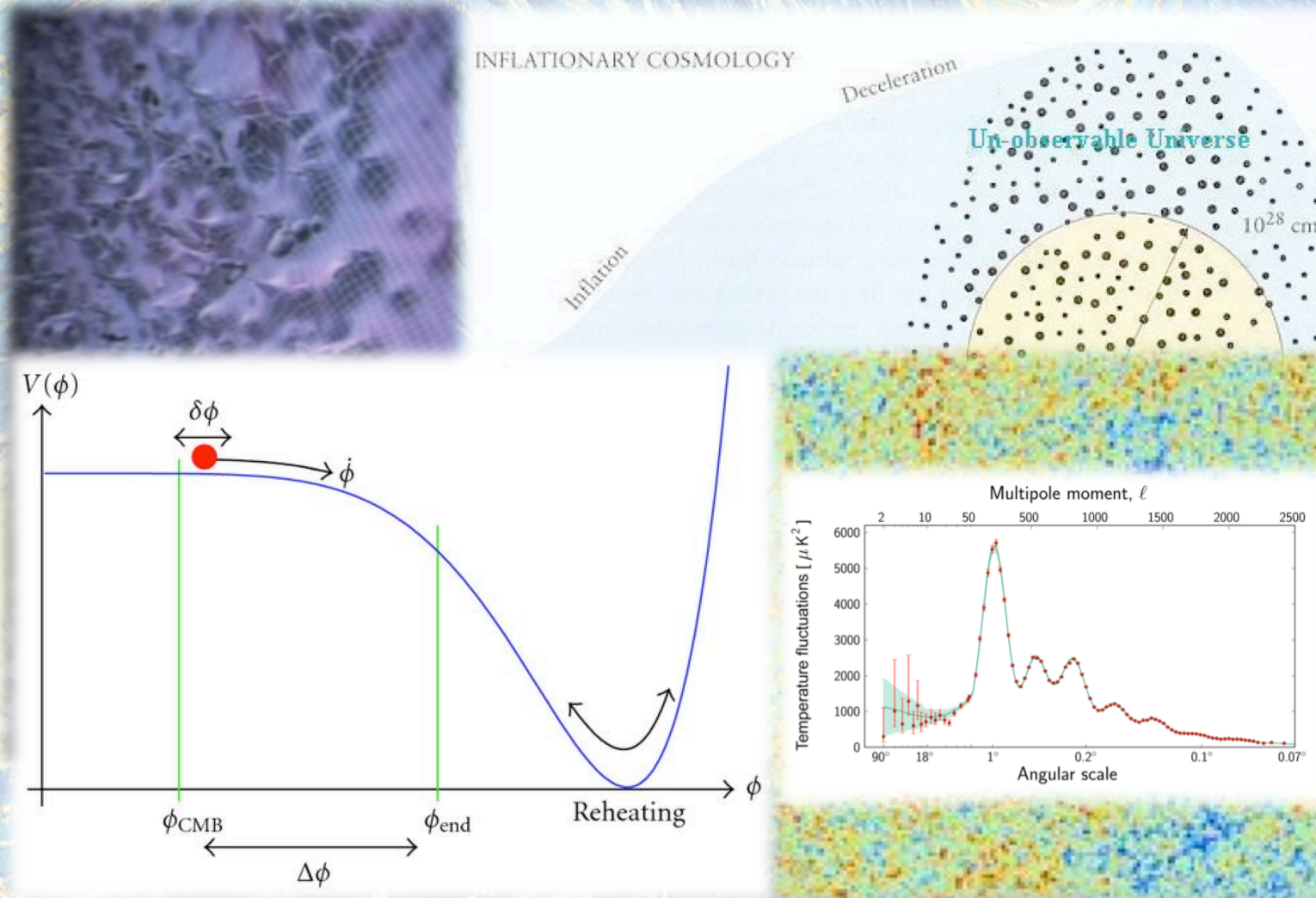
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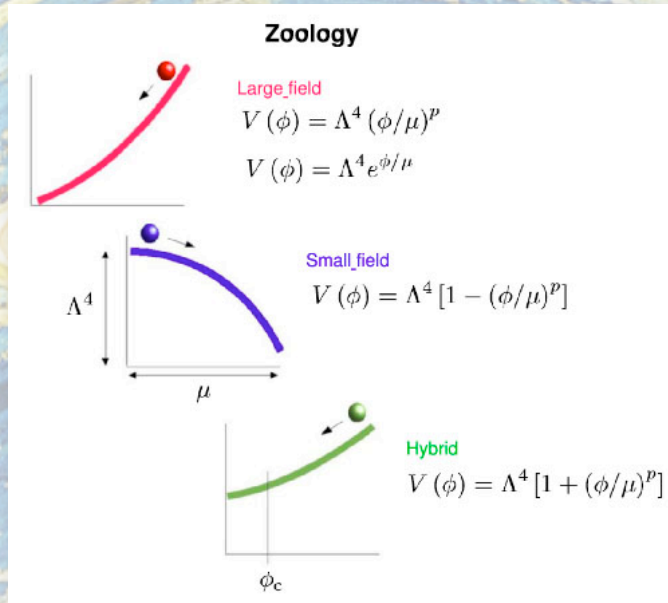
EEN ABSURDE OERKNAL?



KOSMOLOGISCHE INFLATIE



PARADIGMA VERSUS MODEL

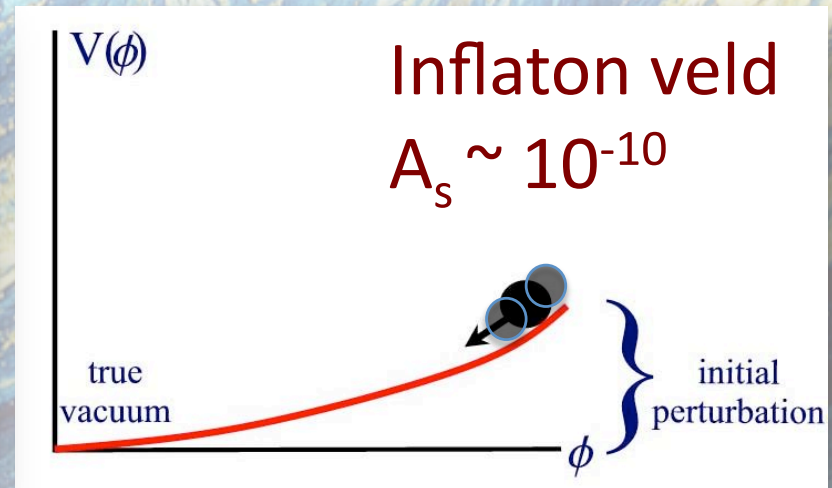


$$P_s = A_s \left(\frac{k}{k_*} \right)^{n_s - 1}$$

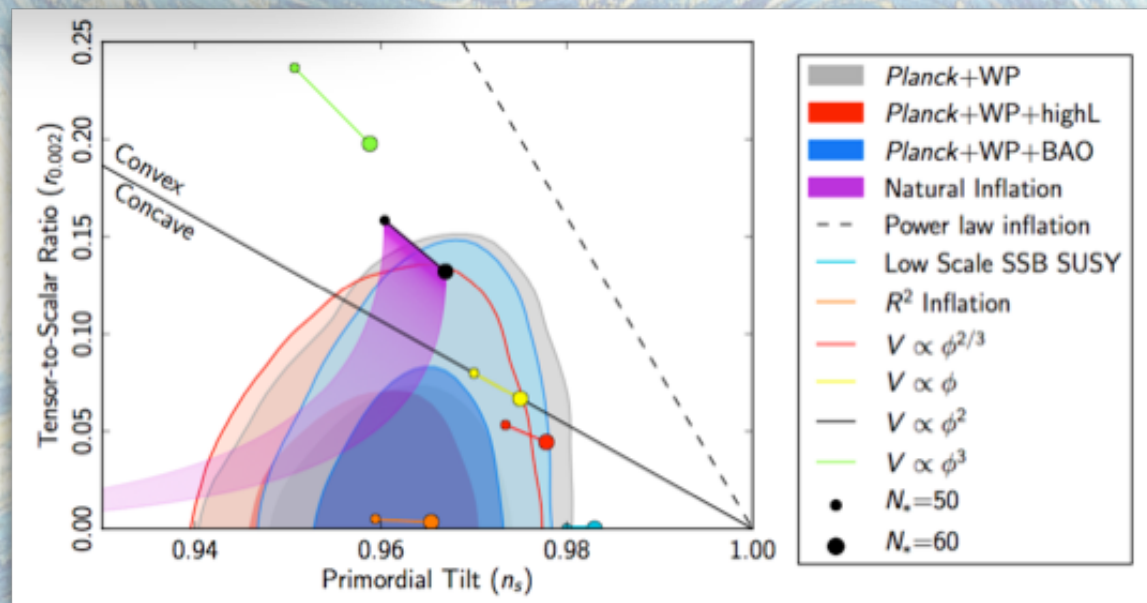
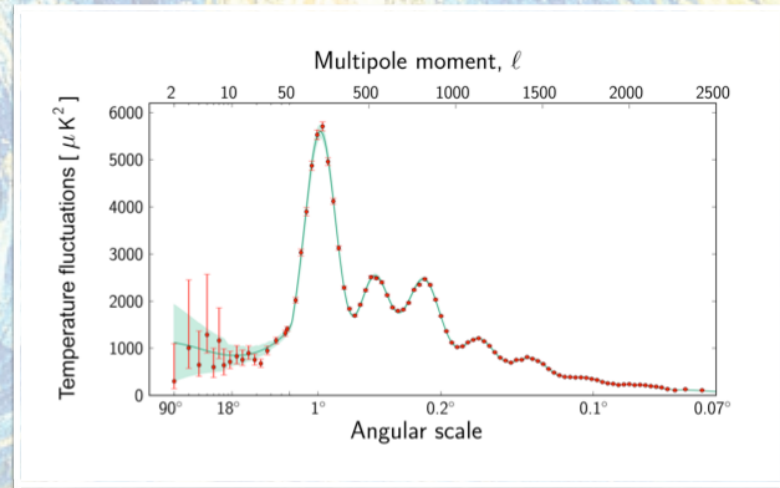
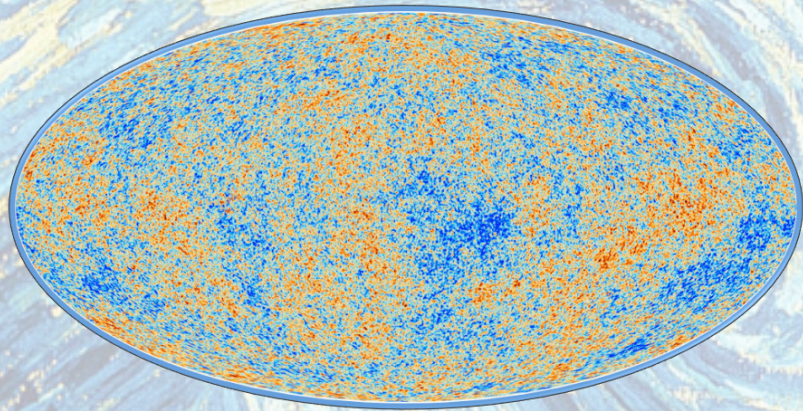
$$P_t = A_t \left(\frac{k}{k_*} \right)^{n_t}$$

$$n_s - 1 = 2\eta - 6\epsilon$$

$$r = \frac{A_t}{A_s} = 16\epsilon$$



OBSERVATIES EN INFLATIE



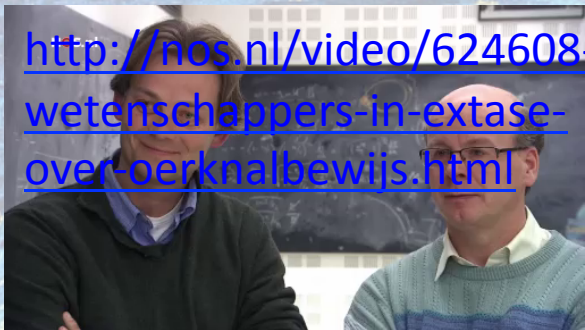
BICEP2 I: DETECTION OF B -mode POLARIZATION AT DEGREE ANGULAR SCALES

BICEP2 COLLABORATION - P. A. R. ADE¹, R. W. AIKIN², D. BARKATS³, S. J. BENTON⁴, C. A. BISCHOFF⁵, J. J. BOCK^{2,6},
J. A. BREVIK², I. BUDER⁵, E. BULLOCK⁷, C. D. DOWELL⁶, L. DUBAND⁸, J. P. FILIPPINI², S. FLIESCHER⁹, S. R. GOLWALA²,
M. HALPERN¹⁰, M. HASSELFIELD¹⁰, S. R. HILDEBRANDT^{2,6}, G. C. HILTON¹¹, V. V. HRISTOV², K. D. IRWIN^{12,13,11}, K. S. KARKARE⁵,
J. P. KAUFMAN¹⁴, B. G. KEATING¹⁴, S. A. KERNASOVSKIY¹², J. M. KOVAC^{5,16}, C. L. KUO^{12,13}, E. M. LEITCH¹⁵, M. LUEKER²,
P. MASON², C. B. NETTERFIELD⁴, H. T. NGUYEN⁶, R. O'BRIENT⁶, R. W. OGBURN IV^{12,13}, A. ORLANDO¹⁴, C. PRYKE^{9,7,16},
C. D. REINTSEMA¹¹, S. RICHTER⁵, R. SCHWARZ⁹, C. D. SHEEHY^{9,15}, Z. K. STANISZEWSKI^{2,6}, R. V. SUDIWALA¹, G. P. TEPLY²,
J. E. TOLAN¹², A. D. TURNER⁶, A. G. VIEREGG^{5,15}, C. L. WONG⁵, AND K. W. YOON^{12,13}

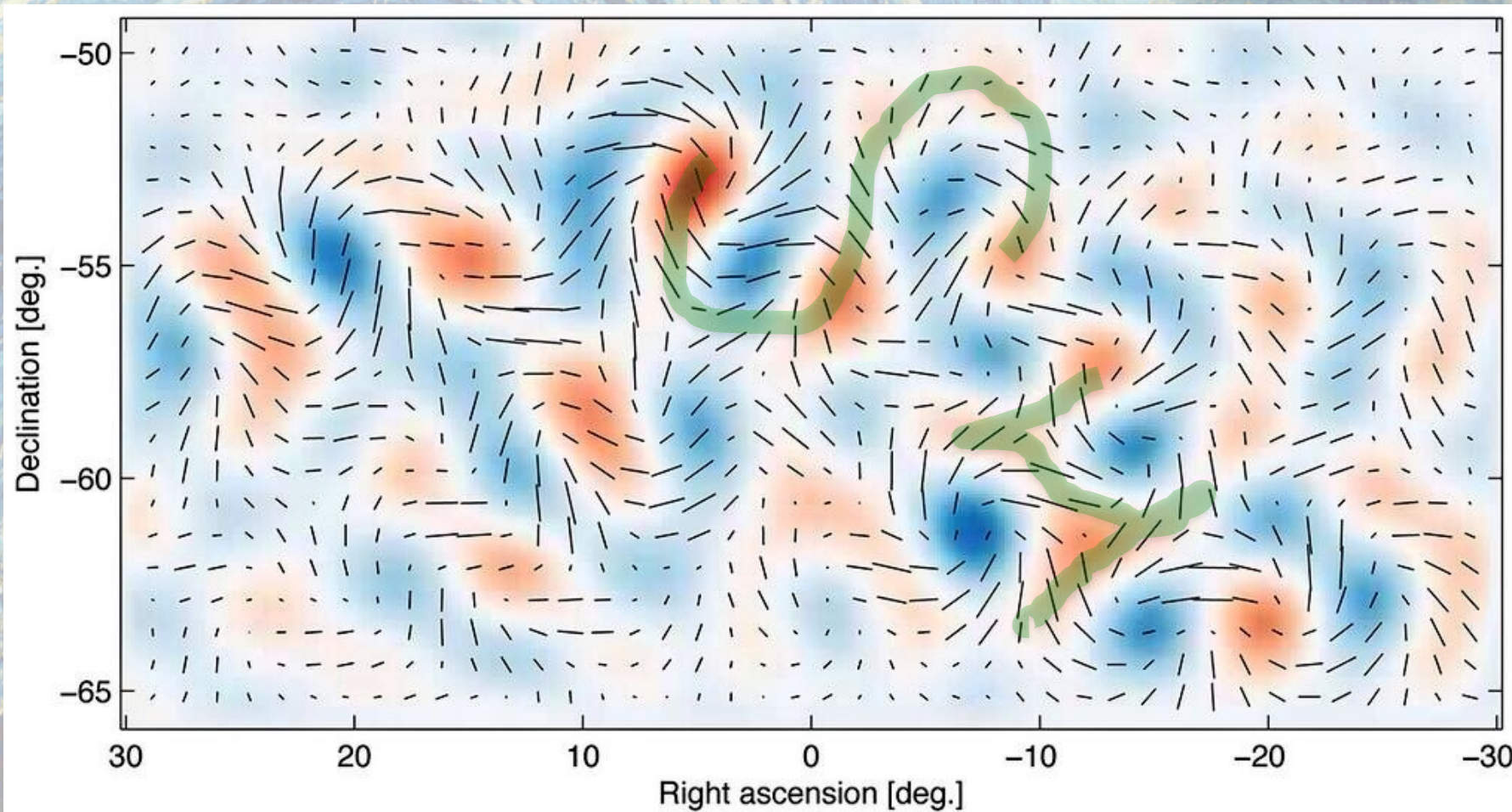
to be submitted to a journal TBD



<http://nos.nl/video/624608-wetenschappers-in-extase-over-oerkrnalbewijs.html>

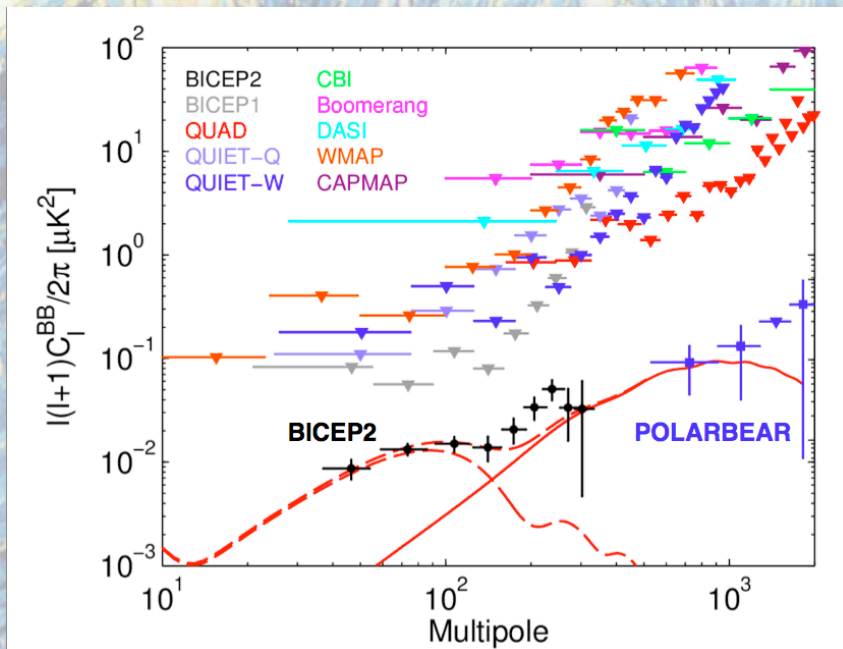


BICEP2

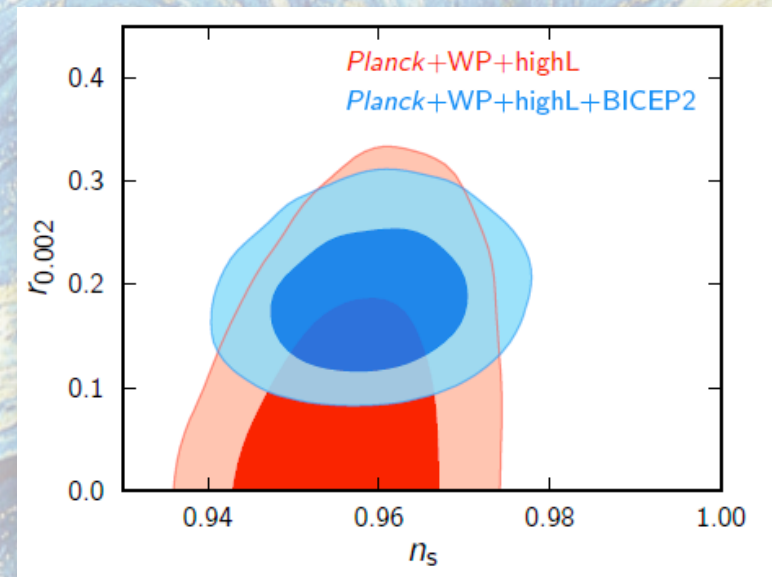


INTERPRETATIE

signal is confirmed with 3σ significance and its spectral index is found to be consistent with that of the CMB, disfavoring synchrotron or dust at 2.3σ and 2.2σ , respectively. The observed B -mode power spectrum is well-fit by a lensed- Λ CDM + tensor theoretical model with tensor/scalar ratio $r = 0.20^{+0.07}_{-0.05}$, with $r = 0$ disfavored at 7.0σ . Subtracting the best available estimate for foreground dust modifies the likelihood slightly so that $r = 0$ is disfavored at 5.9σ .



The simplest and most economical remaining interpretation of the B -mode signal which we have detected is that it is due to tensor modes — the IGW template is an excellent fit to the observed excess. We therefore proceed to set a constraint on the tensor-to-scalar ratio and find $r = 0.20^{+0.07}_{-0.05}$ with $r = 0$ ruled out at a significance of 7.0σ . Multiple lines of evidence



- 'Smoking gun' inflatie
- Energieschaal 10^{16} GeV

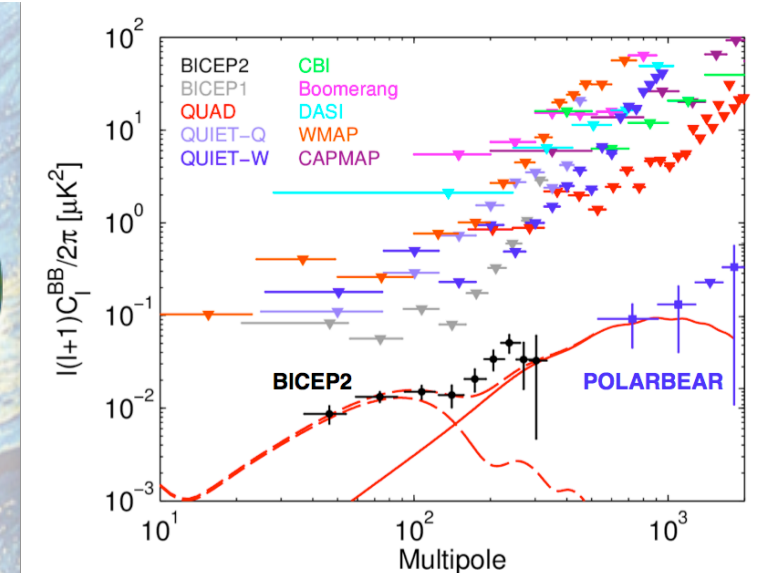
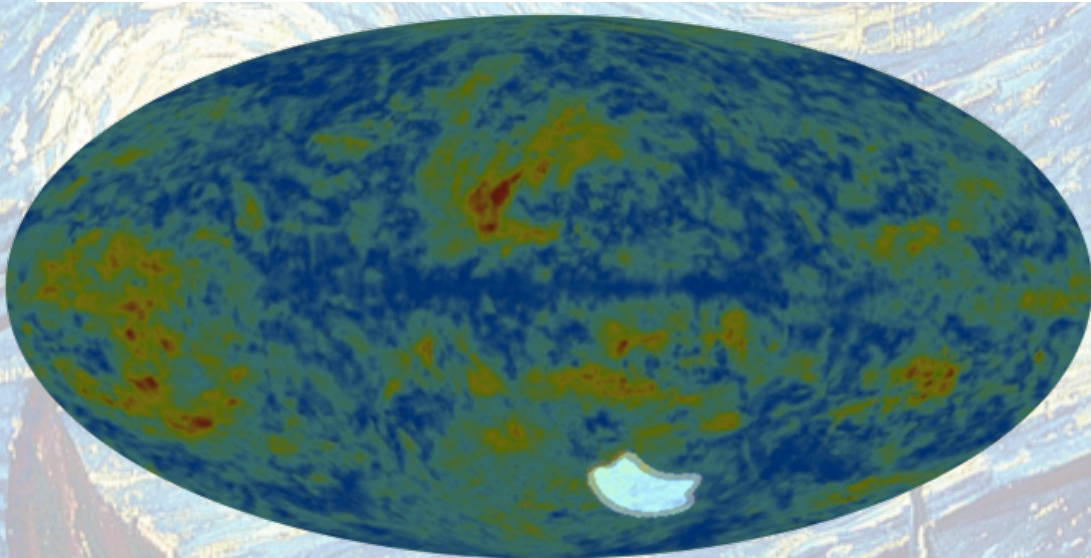
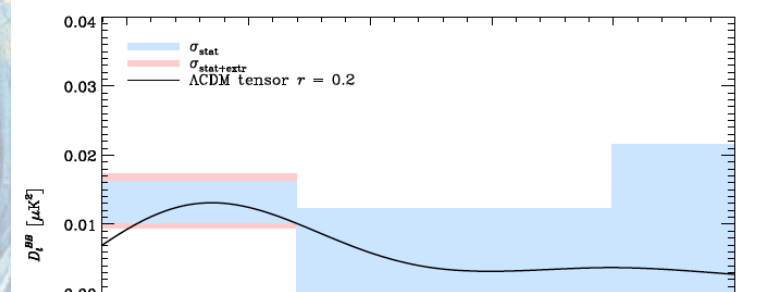
PLANCK, BICEP2 EN STOF

Astronomy & Astrophysics manuscript no. Dust Polarized Cl astro-ph
September 22, 2014

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Planck intermediate results. XXX. The angular power spectrum of polarized dust emission at intermediate and high Galactic latitudes

level of dust polarization in the specific field recently targeted by the BICEP2 experiment. Extrapolation of the *Planck* 353 GHz data to 150 GHz gives a dust power $\mathcal{D}_\ell^{BB} \equiv \ell(\ell+1)C_\ell^{BB}/(2\pi)$ of $1.32 \times 10^{-2} \mu\text{K}_{\text{CMB}}^2$ over the multipole range of the primordial recombination bump ($40 < \ell < 120$); the statistical uncertainty is $\pm 0.29 \times 10^{-2} \mu\text{K}_{\text{CMB}}^2$ and there is an additional uncertainty $(+0.28, -0.24) \times 10^{-2} \mu\text{K}_{\text{CMB}}^2$ from the extrapolation. This level is the same magnitude as reported by BICEP2 over this ℓ range, which highlights the need for assessment of the polarized dust signal even in the cleanest windows of the sky. The present uncertainties are large and will be reduced through an ongoing, joint analysis of the *Planck* and BICEP2 data sets.



B-MODE TOEKOMST

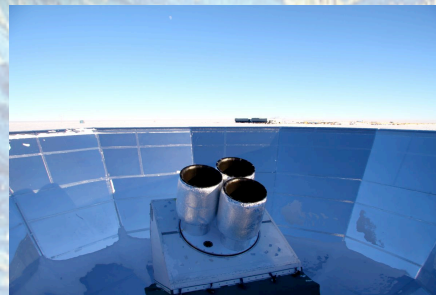
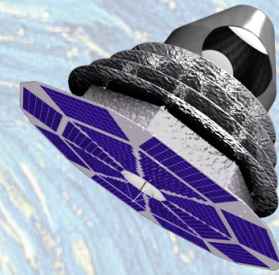


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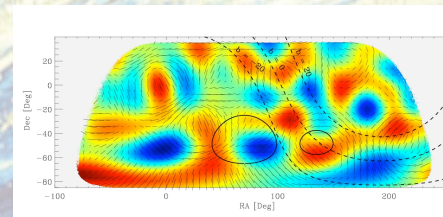
+

Meer frequenties
Verhoogde precisie



KECK ARRAY

SPIDER



VRAGEN?

