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Weighing the dark : cosmological applications of gravitational lensing

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WEIGHING THE DARK

Cosmological Applications of Gravitational Lensing

1. The estimates for the enclosed projected mass of the core of the galaxy cluster RX J1347.5–1145 derived with two independent modelling methods yield small individual statistical uncertainties but a large systematic discrepancy.
(Chapter 2)
2. The statistical precision of weak-lensing galaxy cluster mass estimates promised by the *Euclid* mission can only be achieved if a number of sources of systematic bias can be controlled.
(Chapter 3)
3. The weak-lensing power spectra from CFHTLenS show no evidence for additional physical parameters beyond a flat five-parameter Λ CDM model.
(Chapter 4)
4. Cosmic shear results from KiDS-450 imply a lower amplitude of matter clustering at fixed matter density than that inferred from the most recent measurements of the cosmic microwave background (CMB) radiation by *Planck*.
(Chapter 5)
5. Weak lensing offers a clean and straightforward way of measuring key cosmological parameters, as long as the theory is not confronted with real data.
6. Everyone and in particular every theorist, who wants to perform a cosmological analysis on post-processed high-level data, should be forced to have at least a look at the observations first.
7. Assigning a name to a physical phenomenon, such as dark energy, is the first step in the process of understanding its physical nature. However, this might lead into an entirely wrong direction.
8. The statement that the quality of astronomy publications is higher than it is in academic fields without peer review, only serves the purpose to acquire more funding for astronomy.
9. The current academic publishing process, in particular including the hardcopy print of this thesis, is an anachronism.
10. If your work is your life then a job in academia offers you a well-adjusted work-life balance.
11. Expected professional advantages should only be one reason amongst many for moving to a new city; especially when the name of the city translates to ‘suffering’ in your native language.
12. The exhaustion and stress of finishing a PhD thesis during the UEFA EURO 2016 can be mitigated by the fact that your country of residence did not qualify.