Light weighed: on the statistics and systematics of weak gravitational lensing

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Propositions accompanying the thesis:

"Light Weighed: On the Statistics and Systematics of Weak Gravitational Lensing by Galaxy Groups and Clusters"

1. SG1120–1202 is a unique demonstration of hierarchical structure formation in the lower mass regime. (Chapter 2)

2. The very low mass group regime is still underexposed, considering its relative importance in galaxy evolution. (Chapter 3)

3. Convex Hull Peeling is possibly the regression estimator for weak shear with the lowest bias. (Chapter 4)

4. The bias of estimators used in weak shear regression is not subdominant and needs to be considered. (Chapter 5)

5. The (near) future of precision cosmology with weak lensing will require the joint imaging and shear measurement information from independent observations and methods just as much as extensive simulations.

6. In weak gravitational lensing, it is particularly important to understand and model individual systematic effects, rather than to correct for many systematics with an average.

7. Getting a truly thorough grasp of systematic and statistical effects underlying astronomical analyses will require research efforts that are labor intensive without knowing in advance what, if any, the returns will be.

8. Astronomy is in danger of running out of sky before optimally constraining its uncertainties, which would be a missed opportunity.

9. Learning and teaching, both in the broadest sense of the word, behave like a Fourier transform pair.

10. One cannot be the best academic if one is not a good teacher. One cannot be the best teacher if one is not a good academic.

11. What is considered scientific "progress" will turn out to be catastrophic, because of the lack of understandable "product information leaflets".

12. The Hockney – Falco thesis (Hockney & Falco, 2000; Hockney, 2001) is a proposition by the collaboration between a painter and a physicist about the collaboration between a painter and a physicist. (Cover of this thesis.)

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References:
Hockney, David (2001) Secret Knowledge: Rediscovering the Lost Techniques of the Old Masters. Thames & Hudson: New York.
Hockney, David & Falco, Charles (2000) Optical insights into Renaissance art. Optics and Photonics News, 11(7), 52-59.