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Dancing with the stars

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Propositions

1. (Chapter 1) Testing physics on the scale of galaxy clusters over cosmological time necessitates high-resolution low-frequency wide-band deep radio surveys and advanced computational methods of inference.
2. (Chapter 2a) A Gaussian process with non-diffractive tomographic kernel is better than a Gaussian process with generic stationary kernel for inferring differential total electron content.
3. (Chapter 2b) The geometric and spectral properties of the ionosphere and differential total electron content can be simultaneously inferred.
4. (Chapter 3) It is possible to remove inter-calibrator ionospheric direction dependent effects in radio images.
5. (Chapter 4) Physics-based ionospheric calibration should use the visibilities as observables, and not the Jones scalars.
6. (The Exhausted Scientist) At some point in the future, science will face an existential crisis.
7. (The Ontology Atlas) A vital component of the future of science will be building ontologies that can explain why each belief in science is held.
8. (The Mind and Body Union) All scientists should practice improving their physical fitness on a daily basis where their health permits.
9. (The Double-Edged Sword) Using physics to derive strong priors is only helpful when all systematics are known and accounted for.
10. (The Ideal Scientist) The measure of a scientist is in how readily they give up their most cherished ideas in light of contrary evidence.
11. (The Egotistic Scientist) No scientist is ideal.
12. (The Principle of Avoiding Red Herring) Always return to inspecting the data upon an illogical result.