

Lava worlds: characterising atmospheres of impossible nature

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Propositions accompanying this thesis

Lava Worlds Characterising atmospheres of impossible nature

- 1. The sensitivity and the wavelength coverage of the James Webb Space Telescope are sufficient to characterise major expected opacities of hot super-Earth atmospheres. (Chapter 2, 3)
- Atmospheres of ultra-short period super-Earths are especially prone to deep temperature inversions, severely affecting predicted emission observability. (Chapters 3, 4, 5)
- 3. If you want to detect silicate atmospheres, look for silicon oxides. (Chapter 3)
- Correctly predicting observability requires inclusion of a vast number of chemical species and opacities, the latter of which is often overlooked. (Chapters 4, 5)
- Shrouded magma oceans can visibly contaminate even substantial volatile envelopes of super-Earths and sub-Neptunes. (Chapter 5)
- 6. While theory suggests that strongly irradiated super-Earths should possess atmospheres, there is no clear observational evidence that they do.
- 7. Most effective means of building intuitive understanding of scientific principles is to employ flexible and interactive models as learning tools.
- 8. Clearly articulating a problem in writing can often lead to its quick and effective resolution.
- 9. Effectively sharing and communicating solutions is equally as important as discovering them.
- 10. Convoluted spaghetti plots are the bane of atmospheric chemistry.
- 11. Science teaches us to approach the truth with the assumption that we are wrong a lesson the world can benefit from.
- 12. There ain't no bad week at work that a good borrel cannot fix.