

## CONTRIBUTION FROM CO-AUTHORS

The position in the author list reflects the importance of the contribution of each co-author. I have omitted Jean-Michel Désert from each chapter, as his supervision was present throughout the thesis.

### Chapter 1: Introduction

The introduction was written entirely by CB.

### Chapter 2: Evidence for disequilibrium chemistry from vertical mixing in hot Jupiter atmospheres: A comprehensive survey of transiting close-in gas giant exoplanets with warm-Spitzer/IRAC

Claire Baxter, Jean-Michel Désert, Shang-Min Tsai, Kamen O. Todorov, Jacob L. Bean, Drake Deming, Vivien Parmentier, Jonathan J. Fortney, Michael Line, Daniel Thorngren, Raymond T. Pierrehumbert, Adam Burrows, Adam P. Showman

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CB developed the data reduction pipeline based on previous studies for the reduction of 3.6 and 4.5 $\mu\text{m}$  Spitzer/IRAC data. Data used in the paper was taken from the Spitzer heritage archive, based on proposals by Jean-Michel Désert and Drake Deming. Shang-Min Tsai created the grids of forward models and contributed text to the section describing the models. Daniel Thorngren provided a table of radius anomalies. CB performed all data analysis, comparisons between data and models and wrote the manuscript. All of the co-authors provided feedback to the complete manuscript.

### Chapter 3: A transition between the hot and the ultra-hot Jupiter atmospheres

Claire Baxter, Jean-Michel Désert, Vivien Parmentier, Michael Line, Jonathan J. Fortney, Jacob Arcangeli, Jacob L. Bean, Kamen O. Todorov, Megan Mansfield

*Astronomy & Astrophysics, 639, A36 (2020)*

CB augmented the data reduction pipeline for reduction of Spitzer/IRAC eclipses. CB performed the search of the literature and collected all of the eclipse data. Mike Line provided the grid of forward models and contributed text to the section describing the models. Megan Mansfield provided the HST/WFC3 spectra. CB performed all data analysis on the secondary eclipses and the emission models. All of the co-authors provided feedback to the complete manuscript.

**Chapter 4:** Periodic variability in the brightness of an ultra-hot Jupiter atmosphere

Claire Baxter & Jean-Michel Désert

*To be submitted to Astronomy & Astrophysics*

CB performed the data reduction and analysis of the archival eclipses and wrote the full manuscript.

**Chapter ??:** ??

Claire Baxter, Jean-Michel Désert, Daniel Fabrycky

*To be submitted to Astronomy & Astrophysics*

CB performed the data reduction of the Spitzer transits. Daniel Fabrycky provided the transit times of the Kepler data, fit TTV models to the Kepler data and provided propagated predictions for the transit times of the multi-planet systems. Daniel Fabrycky also performed photodynamical modelling of the Kepler-16 data from Kepler and provided the relevant text for all of his contributions. CB performed the analysis of the reduced Spitzer transits and made comparisons with TTV predictions. CB wrote the manuscript, with the exceptions of the TTV modelling sections. All co-authors provided feedback to the complete manuscript.