

# Some like it hot, some like it cold, some like it mild but old: Chemical kinetics of (exo)planetary atmospheres

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Chemical kinetics is used in many fields of science. In combustion to describe the degradation of fuels. In air quality to describe the transformation of primary pollutants into secondary pollutants. When chemical kinetics data are obtained, they are usually obtained with these specific applications in mind. However, new applications could be found, and here I will present some examples in the field of astrophysics, specifically in the study of (exo)planetary atmospheres. I will share results obtained from our 3D coupled hydrodynamics-radiation-chemistry model, the Met Office Unified Model, adapted to simulate these environments within our Exoplanet Theory Group (ETG, [exoclimatology.com](http://exoclimatology.com)), a multi-disciplinary research group focused on the study of (exo)planetary climates. Hopefully sparking interest in an interdisciplinary collaboration between astrophysicists and chemical kineticists, I will show (1) how combustion chemical kinetics data are used to study the atmospheric composition of hot Jupiters and warm Neptunes, and (2) how Earth's air quality (photo)chemical kinetics data are used to model the atmospheres of terrestrial exoplanets.