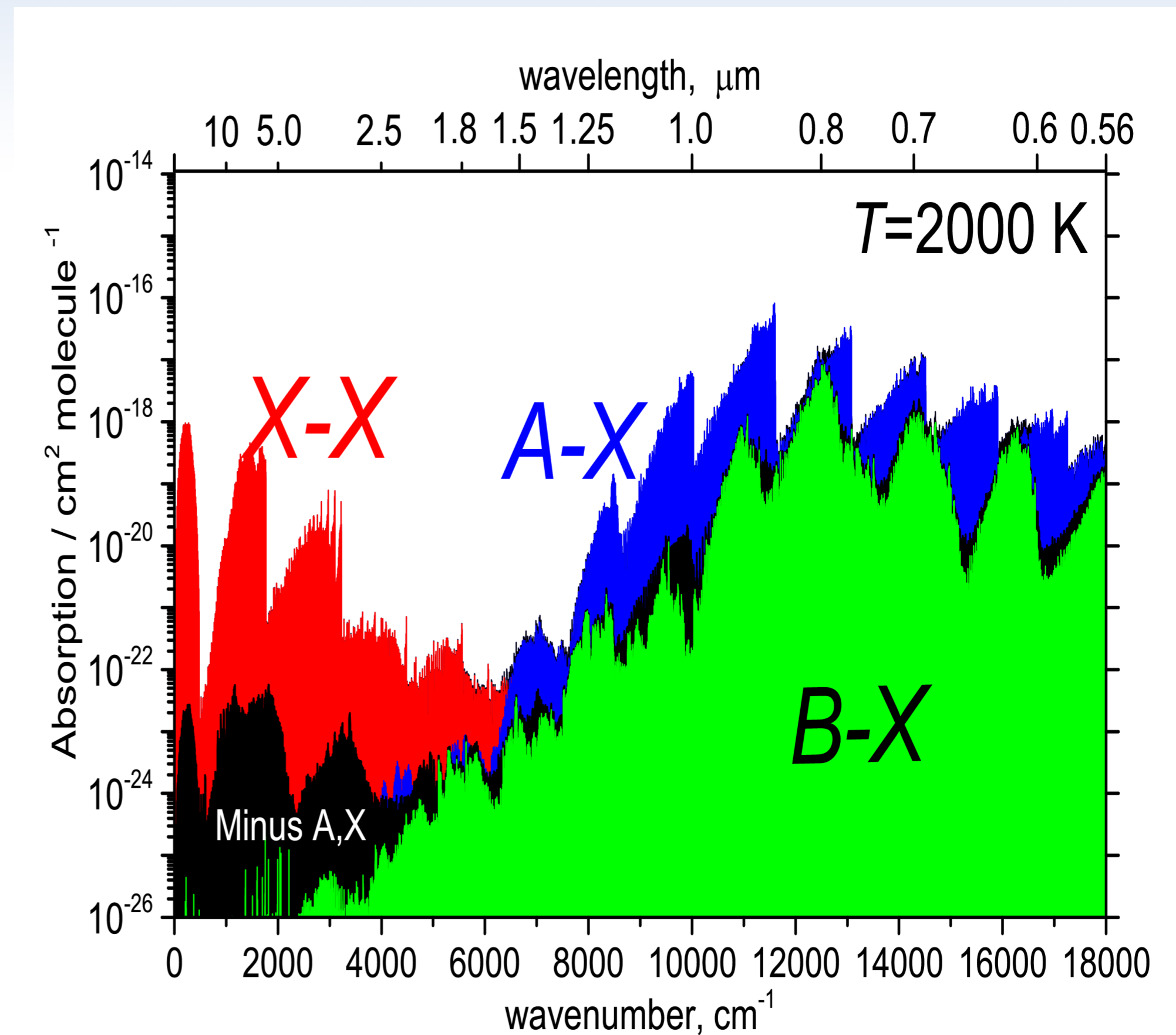


Astrochemistry at Aberystwyth

Calculation of molecular line lists

Introduction

- A molecular line list is a list of wavelengths and associated intensities for a molecule.
- As of June 2018, 15 undergraduate and A-level students have undertaken line list projects in Aberystwyth. Molecules studied include BeH, SrH, BaH, BaO, MnCl, MnF, CrCl, CrF, MgCl, MgF, GeO, MnO, ArH⁺, KrH⁺, XeH⁺, OH⁺ and OH⁻.
- Aberystwyth is part of the Education consortium for the upcoming Twinkle Satellite which will study exoplanet atmospheres.



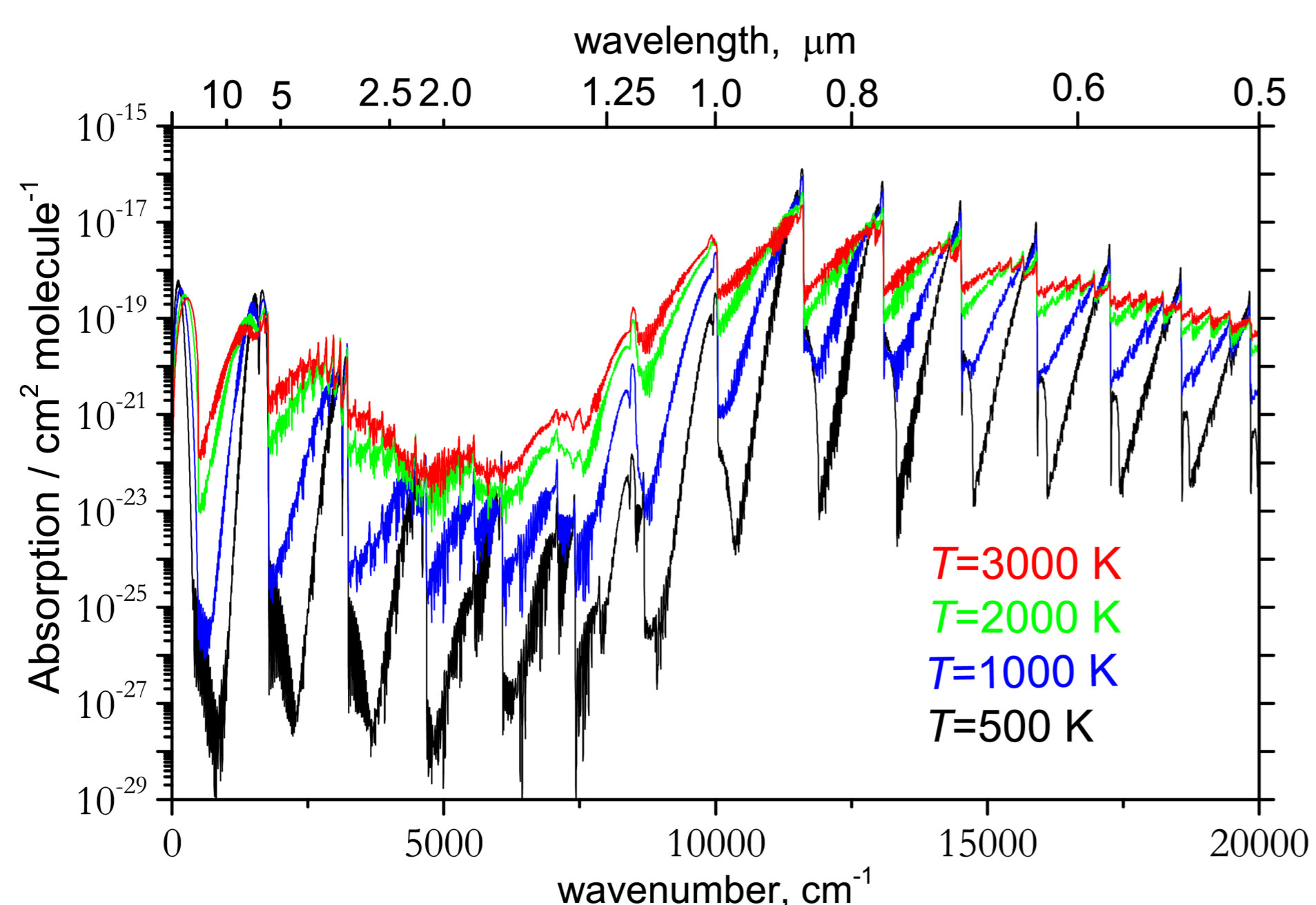
Why is it important?

Computational line list production facilitates:

- Identification of species in exoplanets, brown dwarfs, stellar atmospheres and the Inter Stellar Medium (ISM).
- Accurate atmospheric simulations.

How is it done?

- Theoretical calculations are undertaken using advanced quantum chemistry packages which solve Schrödinger's equation.
- These calculations are then refined by using available experimental data.



What's next?

- Exoplanet and Brown dwarf atmospheric modelling.
- Magnetic field modelling.
- DKIST telescope observations.

<http://exomol.com/>