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► **To cite this version:**

Eszter Dudas, Dimitrios Tsifakis, Christine Charles, Rod Boswell, Samir Kassi, et al.. The Platypus exoplanet project. The multiple approaches to plasma physics from laboratory to astrophysics (Summer school), May 2019, Les Houches, France. hal-02378306

HAL Id: hal-02378306

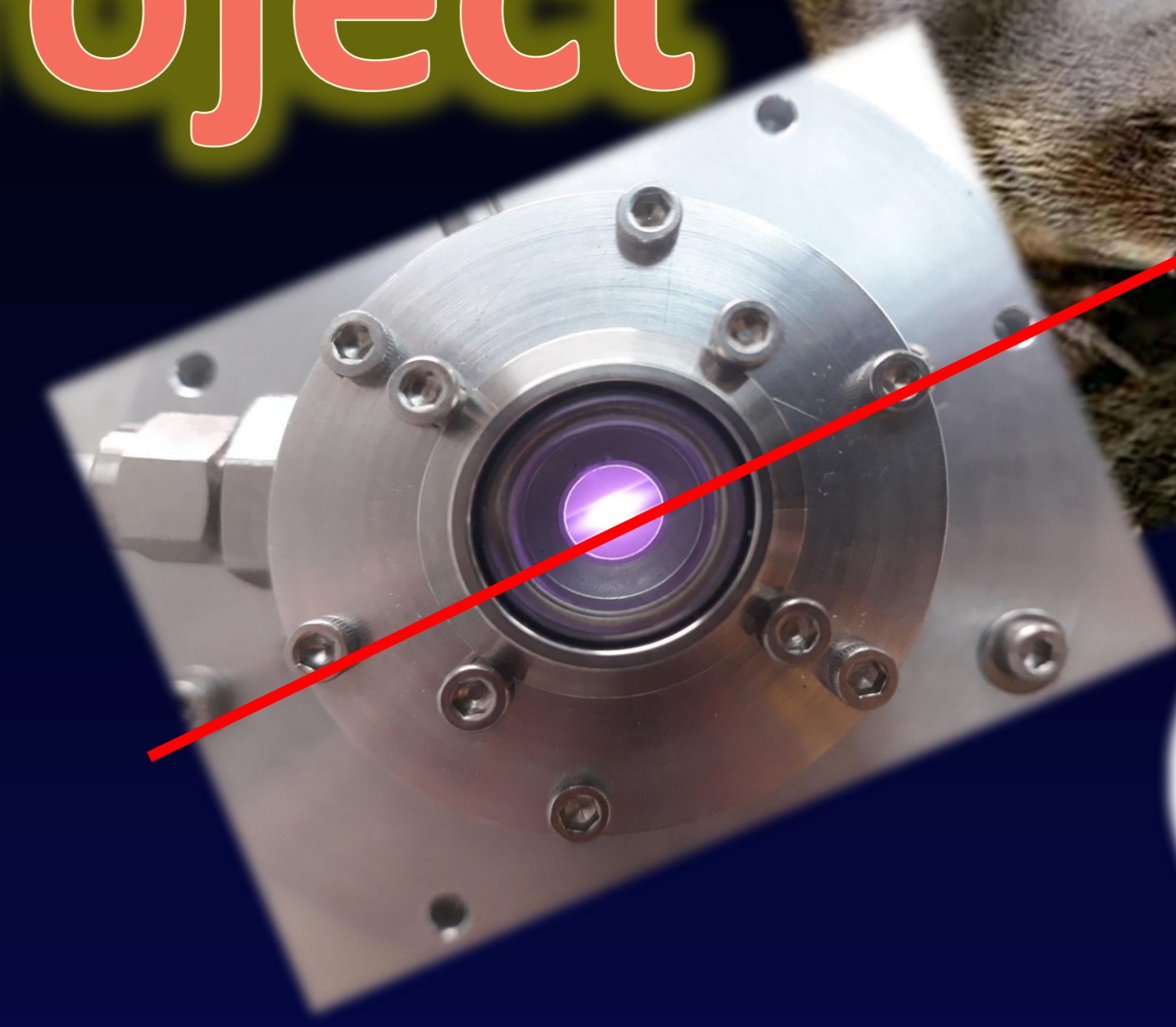
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Submitted on 25 Nov 2019

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The Platypus exoplanet project



Eszter Dudás¹, Dimitrios Tsifakis², Christine Charles², Rod Boswell², Samir Kassi³, Robert Georges¹

¹Institut de Physique de Rennes, Université de Rennes 1 - CNRS, France

²Space Plasma, Power and Propulsion laboratory, Australian National University, Canberra, Australia

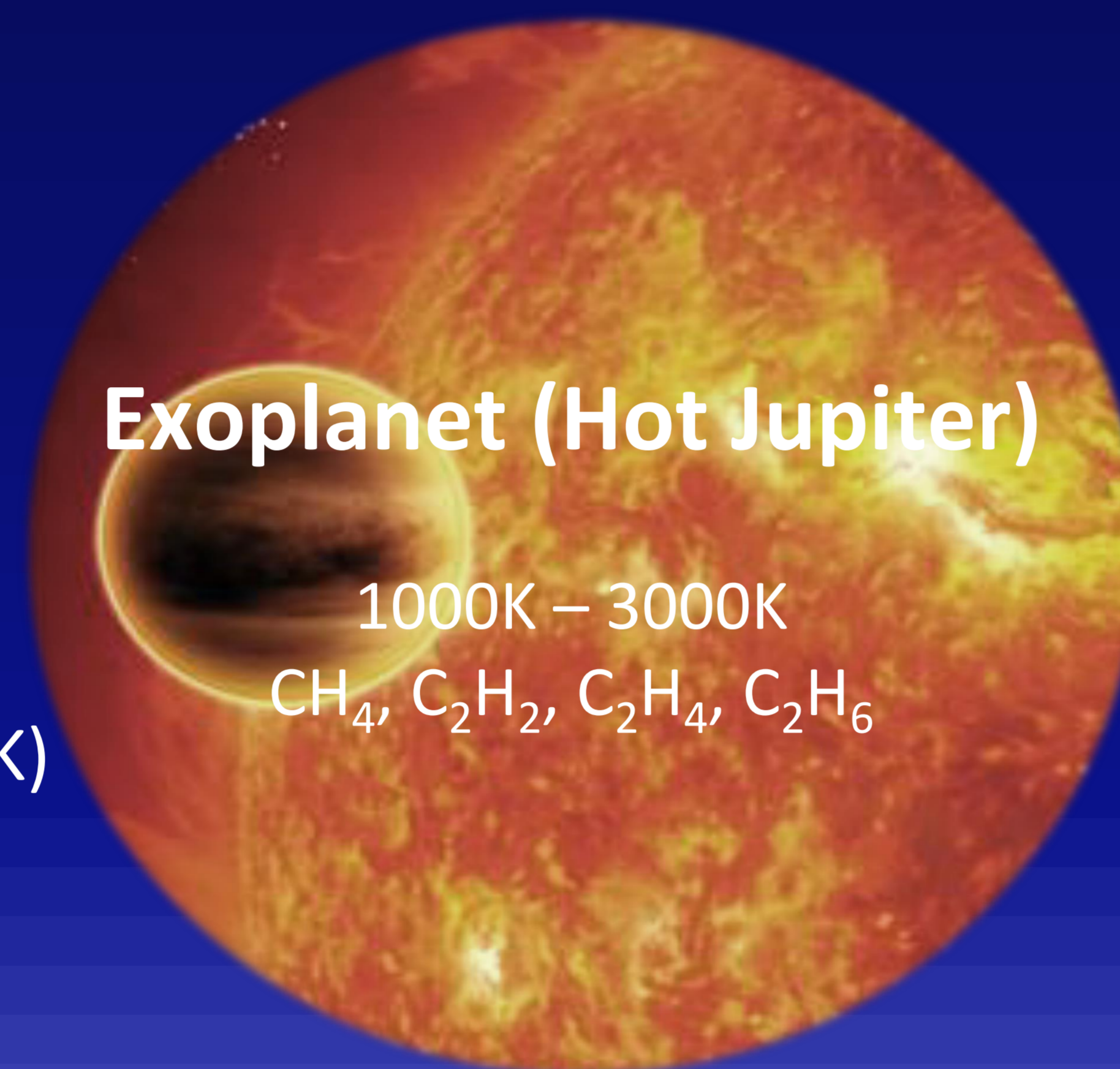
³Laboratoire interdisciplinaire de Grenoble, Université Grenoble Alpes - CNRS, France

Objectives:

- Modelling the atmosphere of Hot Jupiters
- Identification of the diffuse interstellar bands (DIBs)

Transformed Pocket Rocket

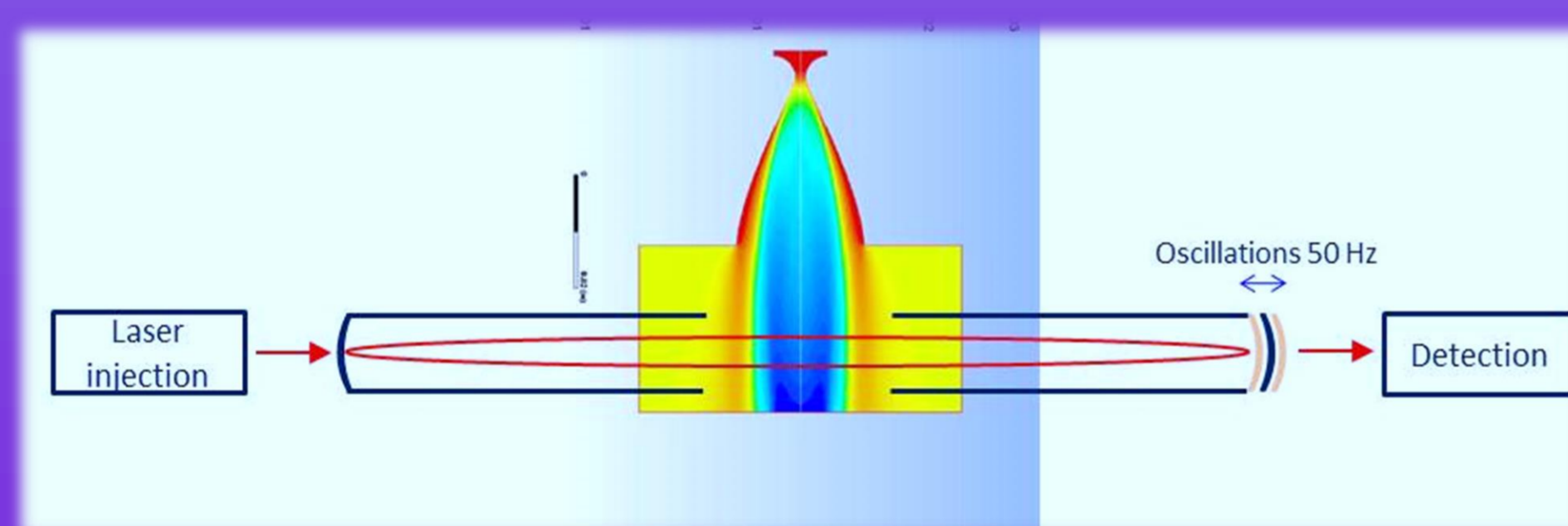
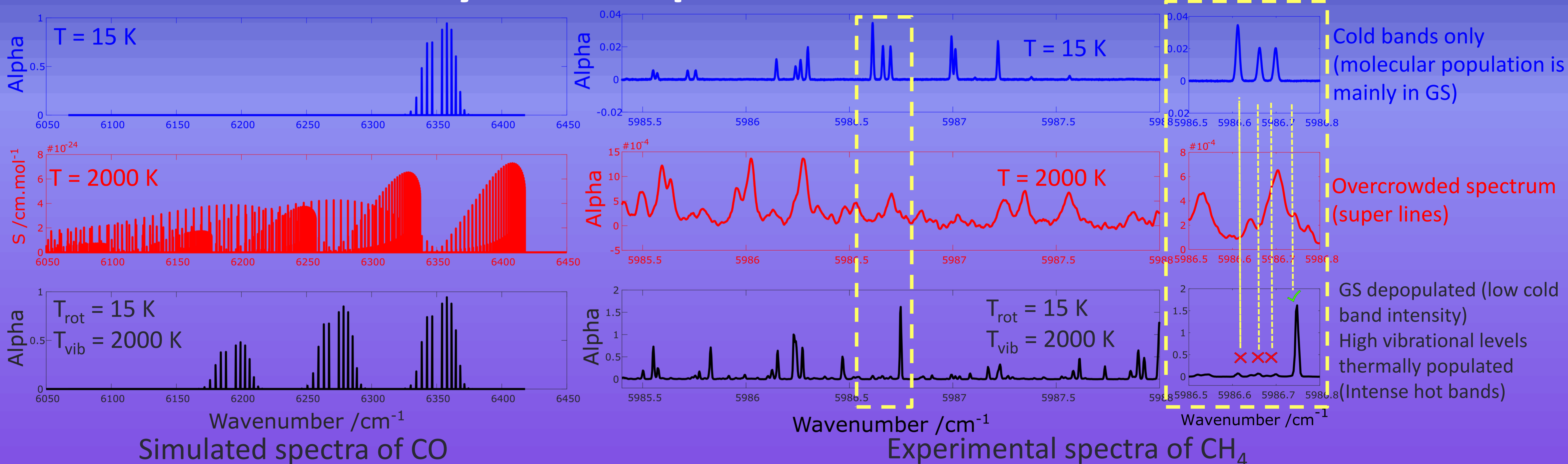
- capacitive electrothermal plasma
- radiofrequency (13.56 MHz) electrothermal thruster (RFETs)
- Power: 30 W
- Supersonic plasma expansion
- High vibrational temperature (several 1000 K)
- Low rotational temperature (several 10 K)



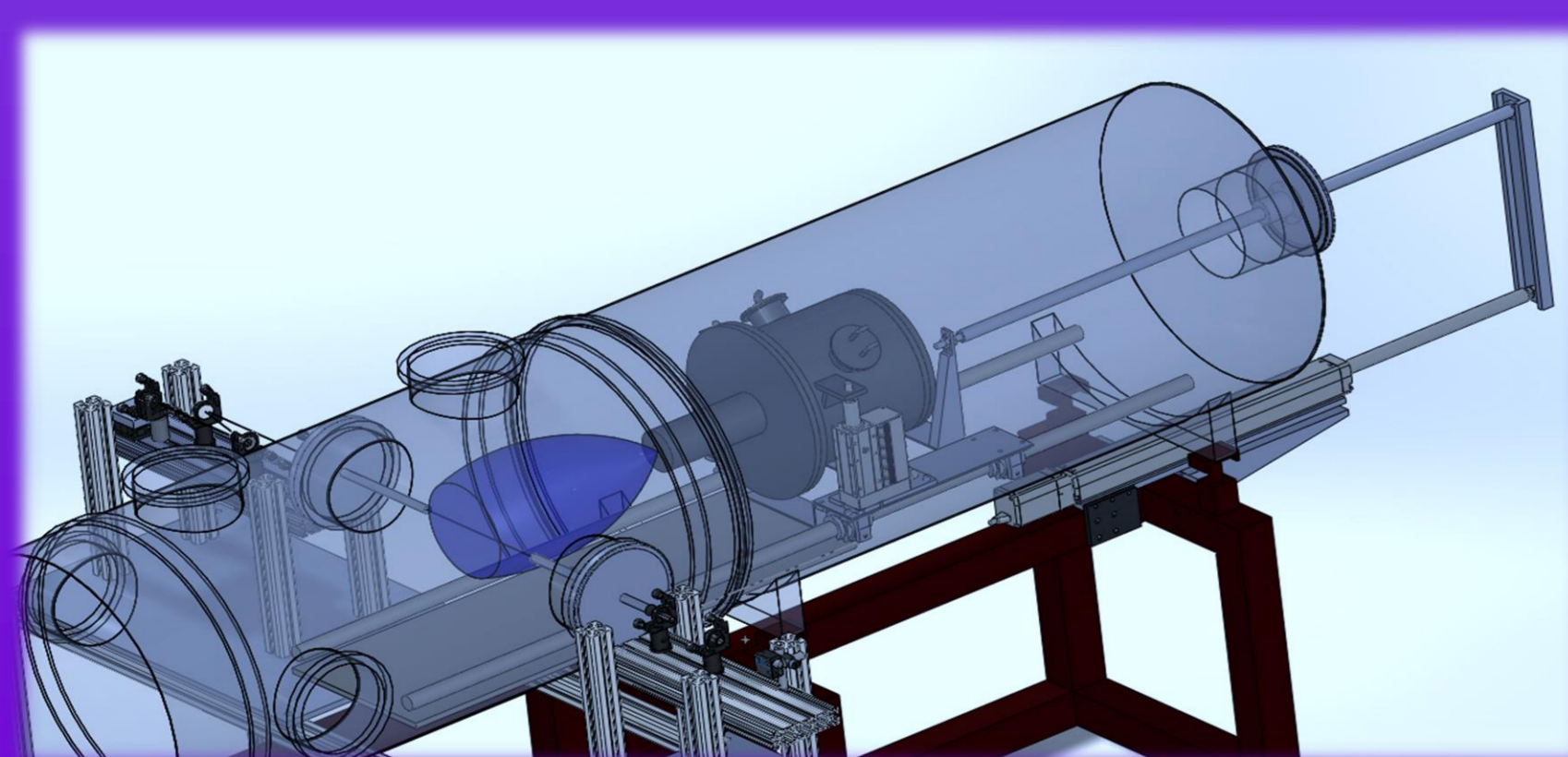
Cavity ring down Spectroscopy

- ultra-sensitive technique
675 m optical path
high-finesse optical cavity
- IR spectrum (1.5 μm range)
- fibered DFB butterfly laser diode
- D_{laser}: 0.5 mm
- τ_{Ring-down}: 180 μs
- Resolution max.: 10⁻⁴ cm⁻¹

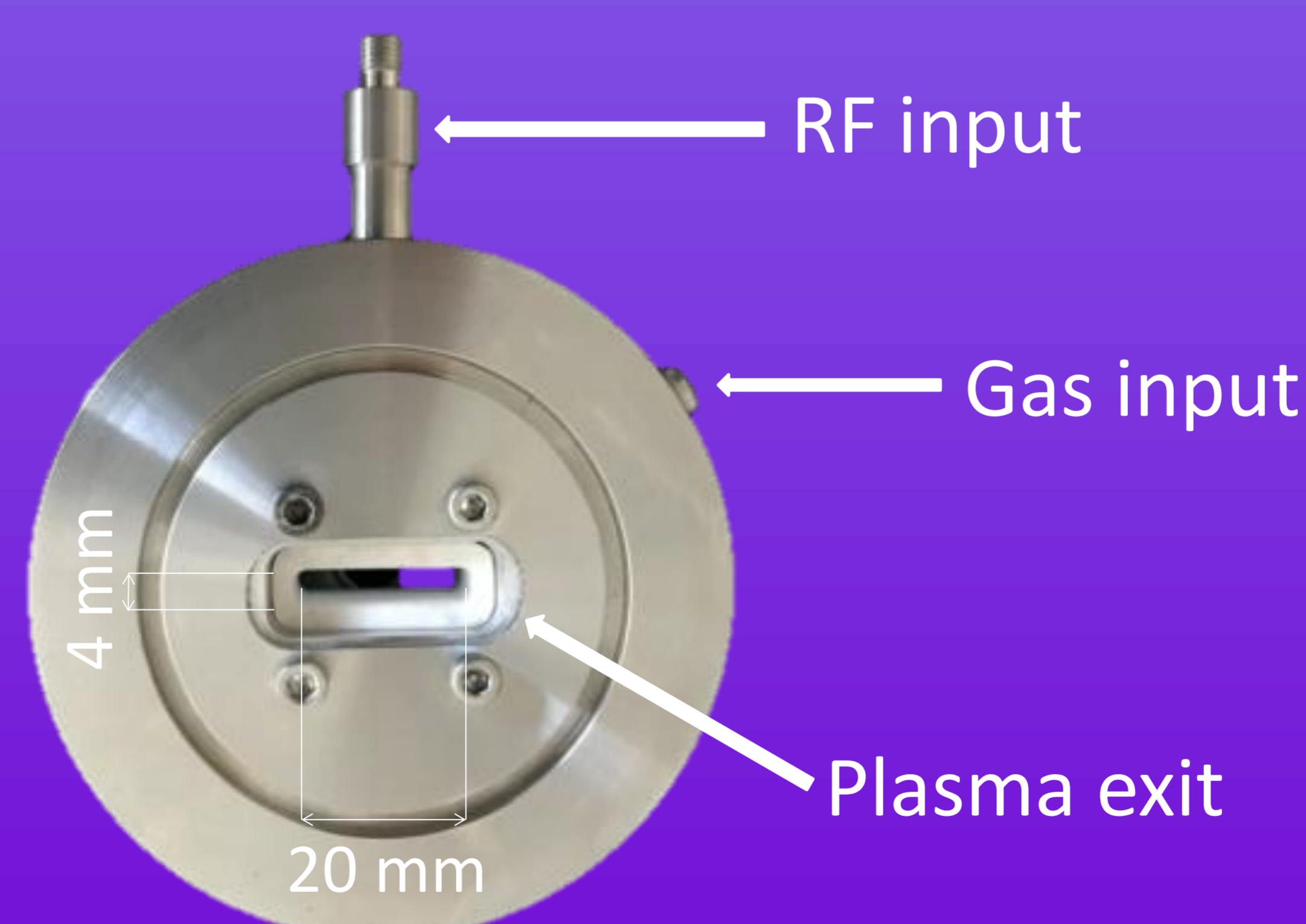
Non Local Thermodynamic Equilibrium – Pocket Rocket – CRDS



Supersonic expansion



Experimental setup



Platypus pocket rocket

Novel geometry:
rectangular cross-section
Large flow rate:
decent signal for CRDS

To do:

- Characterisation of the plasma plume with N₂
- Establishing spectral data of molecules (CH₄) at highly excited vibrational states

Acknowledgements

Special thanks to Christine Charles and the team of Space Plasma Power and Propulsion, ANU. The ANR (e-PYTHEAS project) is acknowledged for the PhD grant of ED. The Technical staff of SP3 and IPR are warmly thanked for their valuable support.