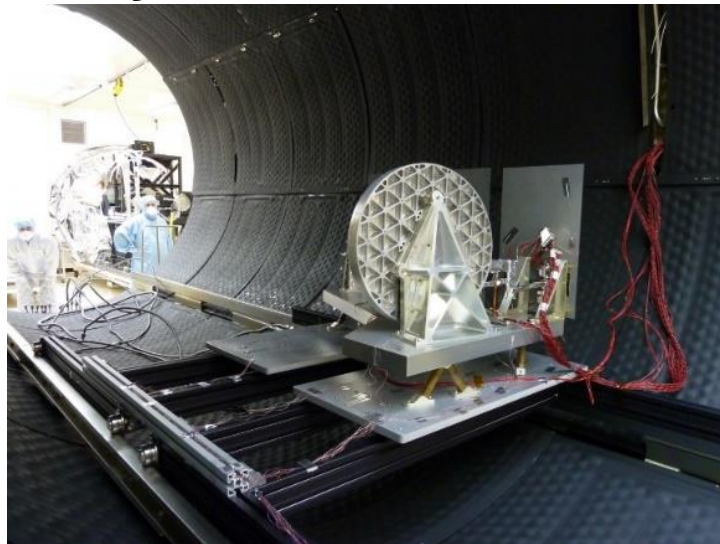


# Café Scientifique Headingley

Monday 10 October 2022

**Terahertz waves:  
the key to alien worlds, black holes, and our own climate concerns.**

**By Alexander Valavanis**



**Outline:** When we look into Space with our existing astronomical equipment, we see less than half the light in our galaxy. Most of this invisible light lies in the terahertz (THz) band of the spectrum, which lies between microwave and infrared wavelengths. Indeed, many important gases in the Earth's atmosphere and the "dark" dust and gas clouds between stars all glow with distinctive THz fingerprints, providing a wealth of hidden information urgently needed by atmospheric and space scientists. Despite this great potential, existing THz sensor systems are too large, fragile, and complex for most applications outside the laboratory and lack the sensitivity needed for studying reactive gases. In this talk, we will look at how new THz components and sensing techniques are being developed, enabling future space missions, and new insights into the Earth's climate, space weather, and star formation.

**Alexander Valavaris** is an associate professor within the School of Electronic and Electrical Engineering at the University of Leeds. His research focuses on terahertz-frequency instrumentation for atmospheric and space research, with particular interest in the design and applications of quantum-cascade laser systems. He holds a UKRI Future Leaders Fellowship and has led several UK Space Agency and Centre for Earth Observation Instrumentation (CEOI) contracts to develop THz satellite instrumentation. He supervises a team of three postgraduate and two postdoctoral researchers, and works extensively with industrial and academic partners, including RAL Space, TK Instruments, Goethe University Frankfurt, the University of Cambridge, and University College London.

**Venue: The New Headingley Club, 56 St Michaels Road, LS6 3BG**

**Time: Room opens 7:30pm, the presentation begins promptly at 7:45pm**

**Entry: Donation please, for room hire and expenses: £4 at the door**



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