

**Job Title: Laser Spectroscopy Project Scientist**

Type of Post: 1 full-time, 1 year fixed term post, 1 full time, 18 month fixed term post.  
Both at Band D.

Location: Rutherford Appleton Laboratory, Oxfordshire, UK

Directorate: Earth Observation and Atmospheric Science

Department: Space Science & Technology

Salary Range: £26,609 to £29,566

Deadline for Applications: 19 March 2010

Interview Date: TBC

### Detailed Job Description

**Key Duties/Responsibilities:** These positions are related to two NERC Technology grants to demonstrate novel laser instrumentation for climate gas and atmospheric pollution monitoring. The jobholders will be undertaking laboratory and field-based research and development work with the Spectroscopy Group at the Rutherford Appleton Laboratory. This work will involve the design, implementation and evaluation of complex optical systems, software development for instrument control, data acquisition and analysis, as well as the reporting of results at international conferences and in journal publications. The successful applicants will be working as part of a small team with opportunities for involvement in a wide range of other research and development projects.

### Background

Applications are invited for up to two Laser Spectroscopy Research Scientist positions based in the Earth Observation and Atmospheric Science Division of the Space Science and Technology Department (SSTD) at the STFC Rutherford Appleton Laboratory. The successful applicant will be part of the Spectroscopy Group which conducts laboratory and field-based research relevant to climate and air quality monitoring, and develops novel spectroscopic instrumentation and measurement techniques. The Group also operates the Molecular Spectroscopy Facility (MSF) on behalf of the Natural Environment Research Council (NERC).

The job-holders will be involved with a number of projects to develop new types of instrument based on quantum cascade laser technology for remote and in-situ molecular sounding. These instruments will have applications in the fields of Earth observation, atmospheric science and pollution monitoring. The positions are funded by the Natural Environment Research Council through the Technology Programme. There will be opportunities for collaboration with researchers at UK and international universities and atmospheric remote sensing experts at RAL.

### List of Duties / Work Programme / Responsibilities

Design, develop and implement complex optical systems for use with semiconductor

lasers. Design and implement instrument control, data acquisition and data processing software and hardware systems. To evaluate the performance of optical systems, including the development of physical theoretical models. Work closely with other scientific and technical staff. Write technical reports and articles for international journals.

### **Contacts and Communication**

Represent the Spectroscopy Group at project progress meetings and with prospective collaborators. Deliver scientific talks at international conferences. Develop a good working relationship with the Laser Spectroscopy Team and actively participate in Spectroscopy Group discussions.

### **Personal Skills and Attributes**

The jobholders should be creative, enthusiastic, dynamic and dedicated. Evidence of previous initiative taking essential.

## **Position and Person Requirements**

**Candidates should note that in completing the online questionnaire you should address yourself to this person specification, demonstrating by example how you meet the criteria contained within. Please also include any other information, which you feel is of relevance to your application.**

### **Qualifications**

Ph.D./D.Phil. in Applied Physics, Applied Chemistry, Atmospheric Science, or another appropriate physical science, with a strong bias towards experimental work, or equivalent experience, is essential.

Ph.D./D.Phil. in Spectroscopy related to Atmospheric or Earth Observation is desirable.

### **Essential Knowledge and Experience**

A proven track record in laboratory molecular spectroscopy preferably in the mid infrared region of the spectrum, or similar expertise in using spectroscopic methods to make laboratory and / or field observations of atmospheric constituents.

Proven experience in performing experimental / applied research using lasers and optical systems.

Knowledge/experience in laser physics.

Knowledge/experience of optics / optical engineering.

Experience in the design and use of complex semiconductor laser-based optical

systems, preferably operating in the infrared spectral region.

Theoretical and practical knowledge of quantum cascade and/or diode lasers.

Previous development of computer code to; control laboratory equipment; record data; analyse and present results.

A history of reporting of results in peer-reviewed journals and at international conferences.

### **Desirable Knowledge and Experience**

Knowledge/experience in Engineering (mechanical and electronic).

Knowledge/experience of optical waveguides.

A track record of planning and executing a programme of scientific research.

Experience of using and programming with the following systems: IDL / MATLAB, PV.WAVE, MS Widows / Unix, Fortran or C.

Knowledge of the techniques of Fourier Transform Spectroscopy.

### **Personal Skills/Qualities**

Enthusiasm for technological developments in the field of laser spectroscopy.

Good oral and written communication ability.

Willingness to learn new tasks.

Ability to work on own initiative and as member of small team.

### **Special Requirements**

Must be able to travel to field sites with possible overnight stays.

Must be able to use computers extensively on a day-to-day basis.

Must be physically able to work safely in a laboratory environment and at a field site.