



**POSITION:** Postdoctoral Appointee – Chemistry

**JOB ID:** 62483

**MANAGER:** Mark Linne

Sandia National Laboratories is the nation's premier science and engineering lab for national security and technology innovation. We are a world-class team of scientists, engineers, technologists, postdocs, and visiting researchers—all focused on cutting-edge technology, ranging from homeland defense, global security, biotechnology, and environmental preservation to energy and combustion research, computer security, and nuclear defense. To learn more, visit <http://ca.sandia.gov/casite/>.

### DEPARTMENT DESCRIPTION

The Combustion Chemistry program, under the principal sponsorship of the Department of Energy's Office of Basic Energy Sciences, seeks to reveal the key chemical processes that underlie the complex mechanisms of combustion. The program emphasizes determining the rates and mechanisms of chemical reactions, characterizing molecular structure and energetics, and measuring and modeling idealized combustion devices. Researchers in the program employ laser-based pump/probe techniques to interrogate chemical reactivity and structure, ion imaging to simultaneously measure the velocity and internal-state distributions of reaction products, and experiments in the femtosecond-domain to directly probe energy conversion within a molecule. In other work, molecular photolysis is coupled with absorption/fluorescence detection methods to determine the thermal rate coefficients and product distributions for reactions that constitute the individual steps in the combustion chain process. Current computational efforts include ab initio calculations of molecular structures and energetics and computer modeling of the complete kinetics of combustion processes in both laminar and turbulent environments.

### JOB DESCRIPTION

We seek a postdoctoral associate to carry out fundamental investigations exploring the kinetics and dynamics of unimolecular and bimolecular reactions, as well as the spectroscopy of free radicals. Measurements in collisional and jet-cooled environments of the dynamics, rate coefficients, and branching fractions of reactions will be performed using several techniques. First, step-scan time-resolved Fourier transform spectroscopy will be used to optically monitor multiple species simultaneously. Second, a unique multiplexed photoionization mass spectrometer employing tunable VUV ionization will be used to measure isomer-resolved reaction kinetics. These experiments will be conducted both at Sandia and at Lawrence Berkeley National Laboratory's Advanced Light Source. Finally, there is an effort in ultrasensitive absorption spectroscopy using cavity-enhanced frequency modulation spectroscopy. Long-term goals include miniaturizing this spectrometer and incorporating frequency comb spectroscopy for ultrasensitive, broad coverage, high-resolution spectroscopy. The postdoctoral associate will be responsible for planning, executing, and interpreting the experiments under the direction of the principal investigator. For more information on recent projects, see <http://www.ca.sandia.gov/crf/staff/staffPage.php?sid=dlosbor>.

### QUALIFICATIONS

A recent PhD (conferred within the past five years) in chemistry, physics, or a closely related field is required for this position. Other required qualifications include (1) a demonstrated ability in fundamental research, as evidenced by publication record and presentations, and (2) experience with laser spectroscopy and/or FTIR spectroscopy, photoionization mass spectrometry, or related detection methods.

Desired qualifications include the following: (1) knowledge of chemical kinetics, dynamics, or combustion chemistry; (2) experience with high-vacuum systems; (3) experience with experimental design and construction; (4) expertise in analog and digital electronics; (5) experience in high-sensitivity absorption techniques; and (6) knowledge of molecular spectroscopy. U.S. citizenship is preferred but is not essential for this position.

**Apply at:** <http://ca.sandia.gov/casite/employment/>. Click on Browse current job openings, and type the Job ID number **62483** into the Keywords box. Click on the Search button to access this job opening, and complete an online application.

### ABOUT SANDIA

Located in Livermore, Sandia/California enjoys close proximity to San Francisco, Silicon Valley, several world-class educational institutions, and diverse cultural and year-round recreational opportunities. Sandia provides employees with a comprehensive benefits package that includes medical, dental, vision, and a 401(k) savings plan. Our culture values work-life balance; we offer programs such as flexible work schedules with alternate Fridays off, on-site fitness facilities, three weeks of vacation, and more.

Sandia National Laboratories is an Equal Opportunity Employer M/F/D/V. If this position requires a security clearance granted by the U.S. Department of Energy (DOE), U.S. citizenship and employee eligibility for clearance processing will be required at the time of hire. If you hold dual citizenship and accept a job offer for a position that requires a DOE-granted security clearance, you may be asked by DOE to renounce your foreign citizenship and retain only your U.S. citizenship.