

**Research Participation Program
U.S. Environmental Protection Agency
Office of Research and Development
National Risk Management Research Laboratory
Research Triangle Park, North Carolina**

Project No #: EPA-ORD/NRMRL-APPCD-2009-05

A postdoctoral research training opportunity in the area of detection of trace air toxics is currently available at the U.S. Environmental Protection Agency (EPA) National Risk Management Research Laboratory (NRMRL) in Research Triangle Park, North Carolina.

Project Description: The EPA's National Risk Management Research Laboratory at Research Triangle Park conducts research on formation mechanisms, quantification methods, and prevention of hazardous air pollutants, particularly halogenated organics such as chlorinated dibenzodioxins/dibenzofurans, biphenyls, and naphthalenes. NRMRL has been funded to study the application of Resonance Enhanced Multiphoton Ionization (REMPI), Single/Multi-Photon Ionization (S/MPI), Time of Flight Mass Spectroscopy (TOFMS) techniques toward development of real time air toxic monitors. This program constitutes a large federally-funded effort whose goal is to develop this method of hazardous air pollutant detection for source characterization, understanding of pollutant formation mechanisms, and pollution prevention. As part of this program, multiple laser systems are being used at EPA's combustion research facility.

Specific Tasks: The participant will be involved in an applied program that couples REMPI and S/MPI with TOFMS, and will operate the REMPI, S/MPI, TOFMS systems and develop their application for trace compound detection. The participant will be part of a team of researchers investigating hazardous air pollutant formation on in-house facilities including waste combustors, industrial boilers, gasifiers, solid fuel combustors, rotary kilns, and laboratory reactors. The participant will interact with leading international laser spectroscopy groups developing these analytical methods for use at EPA, and will apply laser based technologies for detection of trace organic halogens, chemical weapons surrogates, and industrial air toxics as part of a comprehensive program at the EPA's combustion research facility in Research Triangle Park.

For recent illustrative publications relating to this project, see the following:

- “Use of REMPI–TOFMS for real-time measurement of trace aromatics during operation of aircraft ground equipment”, B. Gullett, A. Touati, and L. Oudejans, *Atmospheric Environment*, 42, 2117-2128 (2008).
- “Verification results of jet resonance-enhanced multiphoton ionization as a real-time PCDD/F emission monitor”, B. Gullett, L. Oudejans, A. Touati, S. Ryan, and D. Tabor, *Journal Material Cycles Waste Management* 10, 32-37 (2008).
- “Real-Time, On-Line Characterization of Diesel Generator Air Toxic Emissions by Resonance-Enhanced Multiphoton Ionization Time-of-Flight Mass Spectrometry”, L. Oudejans, A. Touati, and B. Gullett, *Analytical Chemistry*, 76, 2517-2524 (2004).

Qualifications and Skills: Applicants should have received a doctoral within five years of the starting date, or completion of all requirements for the degree should be expected prior to the starting date. The ideal candidate will be an experimental physical chemist with experience in the use of laser-based spectroscopic methods for measurement of gaseous species. The ideal applicant will also have hands-on experience with resonance enhanced multiphoton ionization (REMPI) and Single/Multi-Photon Ionization (S/MPI), and Time of Flight Mass Spectroscopy (TOFMS). Candidates must have excellent verbal and written English skills.

The program is open to all qualified individuals without regard to race, sex, religion, color, age, physical or mental disability, national origin, or status as a Vietnam era or disabled veteran. U.S. citizenship or lawful permanent resident status is preferred (but can also hold an appropriate visa status, however, an H1B visa is not appropriate).

The appointment may be part- or full-time for one year and may be renewed for up to two additional years upon recommendation of NRMRL and subject to availability of funds. The participant will receive a monthly stipend. The participant must show proof of health and medical insurance. **The participant does not become an EPA employee.**

The participant will receive a monthly stipend up to \$5,808. Funding may be made available to reimburse the participant's travel expenses to present the results of his/her research at scientific conferences. No funding will be made available to cover travel costs for interviews, relocation costs, costs of tuition/school fees, or a participant's health insurance.

The Research Participation Program for EPA is administered by the Oak Ridge Institute for Science and Education. ***Please reference Project # EPA-ORD/NRMRL-APPCD-2009-05 when calling or writing for information.*** For additional information and application materials contact: Research Participation Program/EPA, Attn: Betty Bowling, Oak Ridge Institute for Science and Education, P.O. Box 117, Oak Ridge, Tennessee 37831-0117, Phone: (865) 576-8503 FAX: (865) 241-5219 e-mail: betty.bowling@ornl.gov.

An application can be found at www.ornl.gov/orise/edu/EPA/app-gugrgpd.pdf.