Postdoctoral Scientist Position "*Development of new X-ray scattering experiments*"

Postdoctoral Scientist position based at the Department of Chemistry at Brown University in Providence (RI, USA). The project is a collaboration with Professors Peter M. Weber (Brown) and Adam Kirrander (Oxford & Brown), and Dr Hasan Yavas (SLAC National Laboratory). Initial appointment is for one year, with a possible extension for another year upon mutual agreement.

Background

In recent years, we have demonstrated that ultrafast x-ray scattering can track the structural dynamics in ring-opening reactions,[1] observe charge transfer,[2] determine the structure of excited molecules,[3] and observation of the changes in electron density upon photoexcitation.[4] The key goal of this project is to build on these advances and develop the next level of instrumentation for ultrafast gas phase x-ray scattering to image molecular structure, electron dynamics, and chemical transformations.

1. Minitti *Phys. Rev. Lett.* 114 255501 (2015); **2.** Yong *Proc. Nat. Acad. Sci.* 118 e2021714118 (2021); **3.** Stankus *Nat. Chem*. 11 716 (2019); **4.** Yong *Nat. Comm*. 11 2157 (2020)

Project description

The main goal is to advance the experimental setup of x-ray scattering experiments and aligns closely with the new instrumentation development effort at SLAC that is part of the high-energy and high-repetition-rate upgrade project, LCLS-II-HE. The project provides excellent opportunity to develop expertise in state-of-the-art x-ray instrumentation technologies and x-ray optics. The successful candidate should expect to spend considerable time at SLAC (CA, USA) as part of their project. The instrument developments will be accompanied by proof-of-principle experiments at synchrotrons on ground-state molecules and then be implemented at LCLS-II on molecular targets in the gas-phase.

The project provides exposure to cutting-edge x-ray and AMO physics, with great potential impact in application areas such as photochemistry. There may also be opportunities, via the Kirrander group, to engage in advanced quantum dynamics and electronic structure calculations, including state-of-the-art cross-section calculations for x-ray/matter interactions.

For further information, please contact Peter Weber (peter_weber@brown.edu), Adam Kirrander (adam.kirrander@chem.ox.ac.uk) or Hasan Yavas (yavas@slac.stanford.edu).