

## USGS NSF GRIP Opportunity

- USGS Center:** Illinois Water Science Center
- Project Title:** Large-scale Particle Image Velocimetry (LSPIV) for Measuring Complex Flows
- Project Hypothesis or Objectives:** Valuable hydraulic data such as water levels, estimates of discharge, inundated areas, etc., can be extracted from photos and movies taken by engineers and scientists that can be used to help improve the analysis and understanding of flood hazards. The objective of this internship is to analyze Large-scale Particle Image Velocimetry (LSPIV) data collected for the purpose of standardizing methods for using LSPIV to estimate discharge and measure surface-velocity fields.
- Duration:** 3–12 months
- Internship Location:** Urbana, IL
- Area of Discipline:** Civil Engineering, Water Resources, Earth Science
- Expected Outcome:** The expected outcome of this work is to assist a team of academic and USGS researchers in standardizing the LSPIV approach for measuring discharge and complex flow fields and to determine limitations and needed enhancements for the application of this method. It is hoped that a journal article or at least a conference paper will also be written.
- Special skills/training Required:** Applicant ought to be proficient in MATLAB and scientific computing in general. It would be helpful if the candidate has experience with image processing. Completion of a bachelors or masters degree in computer science, earth science related discipline, engineering, applied mathematics, or related field. Fluency in Spanish is desirable, but not required.
- Duties/Responsibilities:** The intern's duties will consist of (1) becoming familiar with current work being done to adapt LSPIV for estimating discharge and measure velocities, (2) analyze measurements previously made for the purpose of evaluating the accuracy of LSPIV measurements, (3) identify refinements for the LSPIV method and document limitations, and as necessary, collect additional validation data. As

needed, the intern will also assist in the analysis of LSPIV data for measuring complex flows in the field.

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