Seth William Musser, University of Chicago
Research/Employment Experience

RESEARCH EXPERIENCE:

April 2016-Present – Prof. William Irvine, Department of Physics, University of Chicago
Built python simulation of the motion of a hydrofoil through a 2D superfluid governed by the Gross-Pitaevskii equation (GPE). Using simulation to understand vortex nucleation phenomena. Long-term planes to compare simulation results to those of incompressible inviscid fluids, and to extend to a 3D superfluid governed by the GPE.
June-August 2016 – NSF REU – Sean Howe and Prof. Peter May, Department of Math., University of Chicago
Worked for the Mathematics REU program studying Riemannian geometry and the spectrum of the Laplace-Beltrami operator. Used this study in order to understand Weyl's law and the basics of DeWitt expansion.
June 2016 – Prof. Panagiotis Souganidis, Department of Math., University of Chicago
Attended the third graduate summer school in analysis. Topics ranged from Brownian motion to control theory.
Jan. 2015-March 2016 – Prof. Norman Lebovitz, Department of Math., University of Chicago
Studied basic fluid turbulence through discussion of seminal papers in the field, and worked through several texts. Studied the application of the Hamiltonian formulation of inviscid fluid mechanics to stability results for Riemann ellipsoids. Numerically and analytically evaluated various methods to probe stability within this context.
June-August 2015 – NSF REU – Clark Butler and Prof. Peter May, Department of Math., University of Chicago
Worked for the Mathematics REU program studying symplectic geometry and Poisson manifolds to develop a rigorous background for understanding the Hamiltonian formulation of inviscid fluid mechanics.
June 2015 – Prof. Panagiotis Souganidis, Department of Math., University of Chicago
Attended the second graduate summer school in analysis.
June-August 2014 – NSF REU – Ben Seeger and Prof. Peter May, Deparment of Math., University of Chicago
Showed that regular perturbation theory fails to address the weakly nonlinear oscillator with certain types of analytic forcing. Demonstrated the utility of two-timing as an alternative.

WORK EXPERIENCE:

Jan.-June 2016, Sep.-June 2015 – Junior Tutor, Department of Math., University of Chicago
Graded homework for introductory calculus courses. Led a tutorial session twice a week to ensure students understood the material and gave quizzes and other formative assessments.
August – Oct. 2014 – Orientation Leader, College Programming Office, University of Chicago
Lead a group of approximately 30 members of the Class of 2018 in a series of discussions about drugs, alcohol, sexuality, race, and privilege at the college. Conveyed the college's expectations while facilitating discussions.