James Schloss

Quantum Systems Unit, Okinawa Institute of Science and Technology (OIST)
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EDUCATION

Ph.D. Ongoing
Okinawa Institute of Science and Technology, Onna-son, Okinawa, JP

B.Sc., Physics 2014
Auburn University, Auburn, AL, US

RESEARCH EXPERIENCE

JSPS fellow, Quantum Systems ongoing
Primary Investigator: Thomas Busch, OIST
Developing GPU computing methods to simulate vortex dynamics in superfluid Bose–Einstein condensates

Research Assistant, Neurobiology Research Unit Summer 2015
Primary Investigator: Jeff Wickens, OIST
Developed an analogue electronic neurosynaptic core for cognitive computing

Research Assistant, Quantum Systems Spring 2015
Primary Investigator: Thomas Busch, OIST
Performed the Chopped RAndom Basis (CRAB) optimum control technique on a rotational ring of strongly correlated ultracold atoms

Research Assistant, Light-Matter Interaction Fall 2014
Primary Investigator: Síle Nic Chormaic, OIST
Investigated particle trapping in plasmonic nano-aperture arrays

Los Alamos Computational Physics Student Summer Workshop Summer 2014
Primary Investigator: Jerome Daligault, Los Alamos National Labs
Developed "Visualization with Blender of One-Component Plasma and Thomas-Fermi Molecular Dynamics Simulations" (VBOTS)

Research Assistant, Plasma Physics Summer 2012 – Summer 2014
Primary Investigator: Edward Thomas, Auburn University
Developed for the "Dynamic Exploration of Microparticle clouds Optimized Numerically" (DEMON) simulation code

Research Assistant, Plasma Physics Summer 2012 – Summer 2014
Primary Investigators: Stuart Loch and Connor Ballance, Auburn University
Performed Monte Carlo simulations of ions and electrons in plasma systems

Research Assistant, Psychology Fall 2011 – Spring 2012
Primary Investigator: Tracy Witte
Studied pain tolerance in patients contemplating suicide

TEACHING EXPERIENCE

Technical Seminars, OIST 2014-2019

Instructed a number of short, intensive classes on a range of technical topics, including: Programming with python, Data structures and algorithms, Git, Fourier Transforms, Filmmaking for Scientists, Julia, Terminal, GPGPU computing, gnuplot, and bioinformatics.

Teaching Assistant, Physics Spring 2013 - Spring 2014

Instructed laboratory sessions for general physics (PHYS 1000) and trigonometry-based physics II (PHYS 1510) at Auburn University.

ACADEMIC WORKS

Papers:

Non-adiabatic generation of NOON states in a Tonks-Girardeau gas
J. Schloss, A. Benseny, J. Gillet, J. Swain, Th. Busch
New Journal of Physics 18 (3), 035012

GPUE: Graphics Processing Unit Gross–Pitaevskii Equation solver
J Schloss, LJ O'Riordan
Journal of Open Source Software 3 (32), 1037

Chaotic few-body vortex dynamics in rotating Bose-Einstein condensates
T Zhang, J Schloss, A Thomasen, LJ O'Riordan, T Busch, A White Physical Review Fluids 4 (5), 054701

Awards, Grants, and Fellowships:

JSPS KAKENHI Grants-in-aid, JP17J01488 2017-2019
JSPS DC1 Research Fellowship for Young Scientists 2017-2019
Auburn University Physics Department Undergraduate Research Award 2014

PROFESSIONAL SKILLS

Languages & Software: C++, CUDA, Fortran, Python, Julia, OpenGL, Linux

Software projects:

Algorithm Archive: www.algorithm-archive.org/
GPUE, OIST: github.com/GPUE-group/GPUE
DEMON simulation code, Auburn University: github.com/AU-PSL/demonsimulationcode
VBOTS visualization, Los Alamos National Labs.

PUBLIC WORKS

Arcane Algorithm Archive: algorithm-archive.org
Leiosos, youtube: youtube.com/user/leiosos
simuleios, twitch: twitch.tv/simuleios
Loachapoka Elementary science demonstrations, Auburn.
OIST high school talks.

Additional details:

President of Computer Science Club at OIST
Communications officer, OIST Student Council (2017)
IT officer, OIST Student Council (2018)