Jacob Price

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Education

University of Washington
2012-Present

PhD Candidate in Applied Mathematics
MS in Applied Mathematics
Advisor: Panos Stinis

Kalamazoo College
2008-2012

Bachelor's Degree with Honors in Mathematics and Physics
Summa Cum Laude

École Supérier de Commerce
2010-2011

Five month study abroad experience in Clermont-Ferrand, France
Program culminated in fluency
Scored five out of a possible six on the Teste de Connaissance du Français

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Honors, Awards, and Fellowships

SIAM Chapter Award
2016

In recognition of outstanding efforts and accomplishments on behalf of the SIAM Chapter at the University of Washington.

Boeing Teaching Award
2015

Awarded for outstanding teaching by a student in Applied Mathematics.

Los Alamos Computational Physics Fellowship
2015

Awarded a summer fellowship to participate in the Los Alamos Computational Physics Workshop.

AAAS Mass Media Science & Engineering Fellows Program
2015

Semifinalist candidate for summer fellowship at a national science media outlet. Declined.

Top Scholar Fellowship Award
2012

A fellowship offered by the University of Washington to promising first year graduate students.

Senior Leadership Recognition Award
2012

Awarded for "enlightened leadership" to graduating Kalamazoo College students.

Gustave W. and Mina B. Moessen Honors Award
2012

Awarded to students graduating summa cum laude from Kalamazoo College.

Clarke Benedict Williams Award

Awarded to excellent graduating Kalamazoo College mathematics or computer science students.

2012

John Wesley Hornbeck Prize in Physics

Awarded to promising graduating Kalamazoo College physics students.

2012

Music Department Award

Awarded for work in the Kalamazoo College Singers and the Kalamadudes Men's A Cappella Group.

2012

Howard Hughes Medical Institute summer research grant

Awarded in pursuant of summer undergraduate research under Dr. Eric Barth at Kalamazoo College.

2011

Park City Mathematics Institute Undergraduate Summer School

Awarded a summer fellowship to attend the undergraduate summer school on image processing.

2010

Thomas O. Walton Prize

Awarded to a member of the junior class for excellence in the work of the first two years in mathematics.

2010

Kalamazoo College Departmental Awards

Received awards from the physics and mathematics departments.

2009, 2010

H.P. and Genevieve Connable Scholarship

Awarded for exemplary performance in science division courses during the first year of undergraduate study.

2009

Kalamazoo College Honors Scholarships

Awarded the general Honors Scholarship and the Competitive Math and Science Scholarship.

2008

Robert C. Byrd Honors Scholarship

Awarded to high school seniors who show promise of continued excellence in secondary education.

2008

Congressional Medal of Merit

Awarded for exemplary citizenship and academic achievement.

2008

Advanced Placement Scholar with Distinction

Took seven Advanced Placement exams, scoring the maximum score of five on six of those exams.

2008

Presentations

1. **Price, J.** and Stinis, P. "A Novel Renormalized Mori-Zwanzig Method for Model Reduction". SIAM Annual Meeting, July 2017. Pittsburgh, Pennsylvania.

2. **Price, J.** "Constructing Novel Reduced Order Models with Memory". PNW Section of MAA Annual Meeting, June 2017. Spokane, Washington.

3. **Price, J.** "Multiscale Techniques for Nonlinear Dynamical Systems: Applications and Theory". General Examination Presentation, February 2017. Seattle, Washington.

4. **Price, J.**, et al. "A Heterogeneous Multiscale Model for Plasma Simulation". University of Washington Applied Mathematics Poster Session, January 2017. Seattle, Washington. **Voted best poster, selected to be presented at SIAM Annual Meeting**. SIAM Annual Meeting, July 2017. Pittsburgh, Pennsylvania.

5. **Price, J.**, et al. "Multiscale Plasma Modeling: Coupling the BGK Equation and Molecular Dynamics". American Physical Society Division of Plasma Physics Conference, November 2016. San Jose, Calfiornia.

6. **Price, J.** "Multiscale Simulation Methods: Concepts and Applications". Seattle University invited talk, October 2016. Seattle, Washington. South Seattle University invited talk, May 2016. Seattle, Washington.

7. **Price, J.**, et al. "Combining Molecular Dynamics with Kinetic Theory". Los Alamos National Laboratory Computational Physics and Methods Technical Talk, August 2016. Los Alamos, New Mexico.

8. **Price, J.**, Shohet, G. "A Heterogeneous Multiscale Model for Plasma Simulation". Los Alamos National Laboratory Student Symposium, July 2016. Los Alamos, New Mexico.

9. **Price, J.**, Shohet, G. "Combining Molecular Dynamics with Kinetic Theory". Computational Physics and Methods Technical Talk, August 2016. Los Alamos, New Mexico.

10. **Price, J.** "Reduced Order Modeling of Systems Without Scale Separation". Nambé Group Meeting, June 2016. Los Alamos, New Mexico.

11. **Price, J.** "Initializing MD with Prime Numbers". Nambé Quarterly Meeting, July 2015. Los Alamos, New Mexico.

12. **Price, J.**, Shohet, G. "The Heterogeneous Multiscale Method: Combining Molecular Dynamics with Kinetic Theory". Nambé Quarterly Meeting, July 2015. Los Alamos, New Mexico.

13. **Price, J.**, Qian, H. "Macromolecular function is not intrinsic to structure in living cells". Poster presentation, University of Washington Applied Mathematics poster session, May 2015. Seattle, WA.

14. **Price, J.**, Qian, H. "Beyond Structure-Function Relation: A Biochemical Circuit with Kinetically Regulated Activation-Inhibition Switching". Frontiers in Biophysics Conference, March 2015. Vancouver, BC. **Awarded second best conference talk**.

15. **Price, J.**, Segal, B. "The Remez Algorithm: Best Fit Polynomial Approximation". AMATH 590: Approximation Theory and Spectral Methods final presentation, December 2013. Seattle, WA.

16. **Price, J.** "The Numerical Computation of Lyapunov Exponents". AMATH 575: Dynamical Systems final presentation, May 2013. Seattle, WA. **Given in fulfillment of requirements for Master's degree**.

17. **Price, J.**, et al. "Memory without Feedback in a Neural Network". AMATH 522: Introduction to Mathematical Biology final presentation, March 2013. Seattle, WA.

18. **Price, J.** "Pole Dynamics of the Korteweg-de Vries and Nonlinear Schrödinger Equations". AMATH 573: Nonlinear Waves and Coherent Structures final presentation, December 2012. Seattle, WA.

19. **Price, J.**, Barth, E. "Numerical Tools for Describing Musical Compositions". Midstates Conference for Undergraduate Research in Computer Science and Mathematics, November 2011. Granville, Ohio.

Affiliations

Mathematics Association of America	2016-Present
American Physical Society	2014-Present
American Mathematical Society	2013-Present
Society for Industrial and Applied Mathematics	2012-Present
Phi Beta Kappa Honor Society	2012-Present
Alpha Lambda Delta Honor Society	2009-Present

Research Experience

University of Washington   Present
Mentor: Panos Stinis and Hong Qian
Studying theory and applications of the Mori-Zwanzig formulation of model reduction. Theoretical research include the development and numerical analysis of novel multiscale methods for systems without scale separation. Applications include nonlinear waves, nonequilibrium phenomena, plasma modeling, and biochemical engineering.

Washington Experimental Mathematics Laboratory   Present
Mentor: Panos Stinis and Jayadev Athreya
Mentees: Jesse Rivera and Landon Shorack
Directs undergraduate mathematics students in the study of conditional path sampling. Provides background and training, and oversees parameter exploration, algorithm development, code optimization, and literature reviews. Potential applications include transition path sampling in protein folding systems.

Los Alamos National Laboratory   2015-2016
Mentor: Michael Murillo
Developed proof-of-principle computational framework for multiscale modeling of plasma. Created a hybrid numerical method combining molecular dynamics simulations and kinetic BGK simulations using the heterogeneous multiscale method.

Kalamazoo College Summer Research   2011
Mentor: Eric Barth
Developed a suite of software to analyze patterns in musical compositions. Inspired by statistical mechanics, sought to quantify differences between composers in various musical eras, identify "characteristic" melodic and rhythmic patterns, and visualize harmonic structures.

Park City Mathematics Institute Undergraduate Summer School 2010
Mentor: Jared Tanner and Luminita Vese
Selected to participate in a three-week intensive course on image processing and wavelets. Hands-on practice was paired with daily lectures and seminars from preeminent researchers in the field.

Computer Programming Experience

Matlab 8+ years of experience
R 6+ years of experience
Mathematica 5+ years of experience
Python 1+ year of experience

Teaching Experience

University of Washington

Instructor of record, AMATH 301: Beginning Scientific Computing. 2015-2017
Instructed over 400 students on scientific computing using Matlab. Reorganized curriculum to improve clarity and challenge. Coordinated with teaching assistants to maximize consistency and learning outcomes. Fluidly integrated "flipped" lectures into the curriculum. Integrated inclusive historical lessons to motivate material and inspire students of all backgrounds.

Instructor of record, CFRM 460: Mathematical Methods for Computational Finance. Instructed over thirty students, including online 2015-2017
students, on mathematical background material needed for pursuing further degrees in computational finance. Developed and gave lectures that were broadcast live and recorded for later viewing. Selected to redesign course curriculum after second year of teaching. Integrated new topics and modified course materials to streamline course and establish suitable challenge level.

Teaching Assistant, AMATH 584: Applied Linear Algebra. Held 2014, 2015
office hours in person and online to answer questions and help with homework. Graded homework and exams.

Teaching Assistant, AMATH 503: Methods for Partial Differential Equations. Held twice-weekly office hours, taught weekly recitations, and 2014
offered additional individual help to students when needed. Coordinated with instructor to effectively cover supplementary material.

Teaching Assistant, MATH 125: Calculus with Analytic Geometry II. Held weekly discussion sections to answer questions and help with home- 2012-2013
work, and held weekly worksheet sections to work through new material in a group setting. Prepared challenge questions to help supplement lectures. Held weekly office hours, proctored and graded exams, organized and led optional review sessions, and attended weekly seminars to coordinate lectures amongst other teaching assistants.

Math Science Upward Bound

Instructor of record, Study Section and Math 5. Helped to coordinate 2017
ongoing partnership between Upward Bound program and the Department of Applied Mathematics. Led daily study sections for underrepresented high school students seeking to study STEM topics in college. Developed weeklong applied mathematics lab that introduces concepts such as differential equations and phase plots. Planned and taught an accelerated AP Statistics course for highly advanced high school students.

University of Washington High School Summer School

Instructor of record, Introduction to Math Modeling. Developed and 2014
taught curriculum for two-week intensive course for advanced high school students in mathematics. Introduced topics such as differential equations, and facilitated mathematical discussions. Hosted guest speakers to discuss the wide range of applications of mathematics.

Outreach and Service

Applied Mathematics Department Diversity Committee

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Founding Member. Collaborated with the administration to represent student interests relating to diversity. Proposed a number of solutions to improve diversity-related outcomes in our department and in the applied mathematics community at large.

2017-Present

Society for Industrial and Applied Mathematics, Student Chapter

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Treasurer (2013-2014), Vice President (2014-2015), President (2015-2016). Organized weekly chapter meetings to provide valuable seminars and presentations for graduate students. Emphasized topics not covered by other aspects of the department, such as student panels on internships and tips and tricks for giving presentations. Organized first and second annual departmental poster session to increase awareness of student research. Coordinated volunteer programs and moderated question and answer sessions with visiting faculty.

2013-Present

Mathematical Biology Journal Club

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Club Leader. Led weekly discussions of contemporary mathematical biology journal articles. Organized group trip to Vancouver for Frontiers in Biophysics conference.

2014-2015

Math Fair

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Workshop Leader. Designed and led elementary school students through interactive and entertaining exercises designed to inspire an interest and passion for mathematics. Students were aged from third to sixth grade. Led discussions of statistics, probability, and logic.

2012-Present

Kalamazoo College

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Departmental Student Advisor. Represented student interests in the department, advised younger students on course selection, met with prospective mathematics students.

2011-2012

Peer Leader. Chosen to act as a mentor for a small group of new students during First Year Orientation and their first quarter. Lead discussion of summer reading, informed students of school policy, helped with the college transition.

2009, 2011

Kalamadudes Music Director. Rewrote the group constitution, arranged pieces for the group, organized and promoted sold-out events. Strengthened group visibility by participating in local competitions and concerts.

2011-2012