Kevin Luna

Curriculum Vitae

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Education

2016 – 2021 **Ph.D Applied Mathematics**, *University of Arizona*, Tucson, Arizona.
Ph.D minor Aerospace Engineering

2016 – 2018 **M.S Applied Mathematics**, *University of Arizona*, Tucson, Arizona.

2013 – 2016 **B.S Physics**, *Northern Arizona University*, Flagstaff, Arizona.
Graduated Magna Cum Laude
Chemistry Minor

2013 – 2016 **B.S Mathematics**, *Northern Arizona University*, Flagstaff, Arizona.
Graduated Magna Cum Laude

Experience

Research

August 2016 – Present **Graduate Assistant**, University of Arizona, Tucson.
- Research focused on studying receptivity and stability of high speed boundary layers in chemical non-equilibrium within the context of fluctuating hydrodynamics
- Developing and applying computational tools for a particular boundary layer stability problem
- Funded through Air Force Office of Research Grant FA9550-15-1-0369

June 2019 – August 2019 **Summer Intern**, Lawrence Berkeley National Laboratory, Berkeley, California.
Interned in the Multiscale Modeling and Stochastic Systems group within the Center for Computational Sciences and Engineering. Worked on extending an importance sampling method known as umbrella sampling to the context of partial differential equations with additive noise

August 2014 – May 2016 **Undergraduate Reserecher**, Northern Arizona University, Flagstaff, Arziona.
Independently worked on a research project focused on the development and application of novel numerical methods to analyze the dynamical behavior of a certain class of nonlinear ODE/PDEs with bifurcation parameters

May 2015 – July 2015 **Summer Intern**, North Carolina State University, Raleigh, North Carolina.
Worked in a collaborative environment on the investigation of the convergence of derivatives of numerical solutions of ODE/PDE formulations of interface problems using the immersed interface method

January 2013 – May 2013 **Undergraduate Researcher**, University of Arizona, Tucson, Arizona.
Worked on a semester long research project funded by the WAESO LSAMP program. My work focused on theoretical and numerical aspects of Nonlinear Elasticity

Teaching Employment

August 2018 – Present **Graduate Teaching Assistant**, *University of Arizona*, Tucson, Arizona.
Developed lesson plans, gave lectures, graded exams and homeworks, and held office hours

January 2016 – May 2016 **Math Achievement Assistant**, *Northern Arizona University*, Flagstaff, Arizona.
Served as a drop-in tutor for Calculus III students, and served as an in-class student teaching assistant

January 2015 – May 2016 **Learning Center Tutor**, *Northern Arizona University*, Flagstaff, Arizona.
Tutored content from chemistry, physics, and mathematics courses in individual sessions.

Research Interests

- Fluid dynamics, Fluctuating hydrodynamics, and Chemical Kinetic Modeling
- Numerical methods, asymptotic methods, and monte carlo methods
- Scientific computing

Skills

Computer Skills

Languages	**Advanced:** Fortran 90, Matlab |**Intermediate**: C++, Python |**Basic**:Wolfram, Julia
Environments	Experienced in coding in Linux enviornments and IDEs (Visual Studio-Windows, Xcode-macOS)
OS	Linux, Windows, macOS
Misc. Tools	Git, Github, Intel compilers and libraries(MKL), LaTeX, Microsoft Office

Languages

English: Native Language \|**Spanish:** Fluent in speaking and reading \|**Italian:** Basic

Publications

Conference Paper	K. Luna and A. Tumin. "*The Role of Fluctuating Dissipative Fluxes in the Receptivity of High-Speed Reacting Binary Mixtures to Kinetic Fluctuations*", Orlando FL, AIAA Paper ID number 3246704, Jan 2020
Conference Paper	K. Luna and A. Tumin. "*Receptivity of High-Speed Boundary Layers in Binary Mixture of Gases to Kinetic Fluctuations*", San Diego CA, AIAA Paper ID number 3031690, Jan 2019
Govt. Tech. Report	A. Tumin, L. Edwards, and K. Luna, "*Receptivity of High-Speed Boundary Layers Kinetic Fluctuations*", Air Force Office of Scientific Research (AFOSR), technical report for AFOSR grant FA9550-15-1-0369, December 2018.

Presentations

Symposium Poster	"*Sampling the Thermodynamic Free Energy of a Ginzburg Landau Model*", CRD Computing Sciences summer poster session, Berkeley, California, August 2019
Seminar Talk	"*Sampling the Thermodynamic Free Energy of a Ginzburg Landau Model*", Workshop on Computational Modeling of Soft Matter and Complex Fluids, Berkeley, California, July 2019
Conference Poster	"*Receptivity of High-Speed Boundary Layers In Binary Mixture of Gases to Kinetic Fluctuations*", Arizona - Los Alamos Days poster session, Tucson, Arizona, April 2019
Conference Poster	"*Modification and Application of a Method for Studying Stability of High speed Boundary Layers*", SIAM CSE 2019 student poster session, Spokane, Washington, February 2019
Conference Talk	"*Receptivity of High-Speed Boundary Layers In Binary Mixture of Gases to Kinetic Fluctuations*", AIAA SciTech 2019, San Diego, California, January 2019
Conference Talk	"*Receptivity of High-Speed Boundary Layers In Binary Mixture of Gases to Kinetic Fluctuations*", APS DFD 2018, Atlanta, Georgia, November 2018
Seminar Talk	"*Including Real Gas Effects in the Analysis of Boundary Layers*", University of Arizona Applied Mathematics RTG Workshop, Tucson, Arizona, December 2018
Seminar Talk	"*Progress in Accurate Gradient Computations for Interface Problems*", NAU Applied Mathematics Seminar, Flagstaff, Arizona, May 2016
Conference Talk	"*Newton's Method For a Semilinear Elliptic PDE on the Unit Disk*", Southwestern Undergraduate Mathematics Research Conference, Phoenix, Arizona, February 2016
Conference Poster	"*Accurate Solution and Gradient Computation for Interface Problems*", Joint Mathematics Meeting student poster session, Seattle, Washington, January 2016
Symposium Poster	"*Accurate Solution and Gradient Computation for Interface Problems*", NCSU research symposium, Raleigh, North Carolina, July 2015

Conference Talk — "*Applying the Galerkin Newton Gradient Algorithm*", Southwestern Undergraduate Mathematics Research Conference, El Paso, Texas, February 2015

Seminar Talk — "*Applying the Galerkin Newton Gradient Algorithm*",Friday Afternoon Mathematics Undergraduate Seminar, Northern Arizona University, Flagstaff, Arizona, March 2015

Awards

2019 Don Wilson Applied Mathematics travel award recipient
2019 Fall Graduate Outreach Scholar
2019 Funded American Institute of Mathematics workshop participant
2018 SIAM CSE 2019 Broader Engagement travel grant award recipient
2018 Univ. of Arizona GPSC travel grant award recipient
2018 Don Wilson Applied Mathematics travel award recipient
2016 University of Arizona Graduate Access Fellowship
2016 Outstanding Poster and Poster Presenter at JMM 2016
2016 MAA student travel grant awardee for presenting at JMM 2016
2016 NAU Office of the Provost travel award recipient
2015 Math Alliance Predoctoral Scholar nomination and travel award
2014 Karan and Terence Hall Outstanding NAU Mathematics Student Scholarship
2014 Vesto M. Slifer Outstanding NAU Physics Student Scholarship
2013 Certificate of Outstanding Scholarship; NAU Dept. of Mathematics & Statistics. 2013-2016.
2013 Dean's list at Northern Arizona University for Fall 2013-Spring 2016
2012 A.S college degree with high distinction concurrently earned with high school diploma
2012 Arizona Board of Regents full tuition scholarship

Teaching Experience

As Graduate Teaching Assistant at Univ. of Arizona

Math 112 College Algebra — Fall 2018
Math 107 Exploring and Understanding Data — Spring 2019

Professional Memberships

American Institute of Aeronautics and Astronautics (AIAA)

American Physical Society (APS)

Society for Industrial and Applied Mathematics (SIAM)

Outreach Service

Spring 2019 **Outreach Scholar**, Apollo Middle School, Tucson, Arizona.
Worked with Apollo Middle School teachers in and outside the classroom to help encorage interest in mathematics and help struggling students

Fall 2018 **Project Mentor**, Univeristy of Arizona, Tucson, Arizona.
Mentored a team of undergraduate student's semester long projects on epidemiology for a Mathematical Modeling course. This culminated in a poster presentation given by the student team

Fall 2017 **Classroom Aide**, Pueblo High School, Tucson, Arizona.
Served as an in-class instructional assitant to students struggling in mathematics.