

Changho Kim

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Education

Brown University Ph.D. and M.Sc. in Applied Mathematics (Advisor: George Karniadakis)	Providence, RI 2010 – 2015
KAIST (Korea Advanced Institute of Science and Technology) Ph.D. and M.Sc. in Chemistry (Advisor: Eok Kyun Lee) B.Sc. in Chemistry and Mathematics (Double major, <i>summa cum laude</i>)	Daejeon, South Korea 2001 – 2007 1997 – 2001

Employment

University of California, Merced Assistant Professor	Merced, CA 2018 – present
Lawrence Berkeley National Laboratory Postdoctoral Researcher (Advisor: John B. Bell)	Berkeley, CA 2015 – 2018
KAIST (Korea Advanced Institute of Science and Technology) Postdoctoral Researcher in Mathematics Department / Business School	Daejeon / Seoul, South Korea 2007 – 2009

Research Interests

Stochastic modeling of multi-physics phenomena arising in fluids and fluid-solid interfaces at small scales

Developing and analyzing stochastic multiscale simulation methodologies
Studying mathematical and physical foundations of stochastic mesoscopic modeling
Synergistic use of stochastic processes, computational fluid dynamics (CFD), molecular dynamics (MD), kinetic Monte Carlo (KMC), high-performance computing (HPC), machine learning (ML), and statistical mechanics

Bridging the gaps at the physics–chemistry–biology interface

Multi-physics problems with multiple length and time scales
▪ Reactive microfluids ▪ Heterogeneous catalysts ▪ Marine aggregates

Scientific computing and machine learning

Machine-learning-based surrogate modeling methodology for efficient stochastic multiscale simulations
Stochastic hybrid multiscale simulation methodology for interfacial systems
Efficient numerical solvers for stochastic PDEs / ODEs

Publications

(* indicates that I served as the (co-)corresponding author)

1. E. Mercado, H.T. Jung, C. Kim*, A.L. Garcia, A.J. Nonaka, J.B. Bell, “Surface coverage dynamics for reversible dissociative adsorption on finite linear lattices”, *J. Chem. Phys.* 159, 144107 (2023). [article]
2. Y. Zhu, H. Lei, C. Kim, “General validity of the second fluctuation-dissipation theorem in the nonequilibrium steady state: Theory and applications”, *Phys. Scr.* 98, 115402 (2023). [article]
3. Y. Zhu, Y.-H. Tang, C. Kim, “Learning stochastic dynamics with statistics-informed neural network”, *J. Comput. Phys.* 474, 111819 (2023). [article]
4. M. Polimeno, C. Kim*, and F. Blanchette, “Toward a realistic model of diffusion-limited aggregation: Rotation, size-dependent diffusivities, and settling”, *ACS Omega* 7, 40826 (2022). [article]
5. M. Mancini, M. Theillard, C. Kim*, “Projection method for the fluctuating hydrodynamics equations”, *J. Comput. Phys.* 463, 111288 (2022). [article]
6. J.H. Lee, C. Kim*, M.E. Colvin, “Molecular dynamics studies of the melting kinetics of superheated crystals”, *J. Phys.*

- Chem. C* 126, 4199 (2022). [article]
7. M.R. Parsa, C. Kim*, A.J. Wagner, “Nonuniqueness of fluctuating momentum in coarse-grained systems”, *Phys. Rev. E* 104, 015304 (2021). [article]
 8. J.H. Lee, C. Kim*, M. Tokman, M.E. Colvin, “Energy component analysis of electric field-induced shape change in water nanodroplets”, *J. Phys. Chem. C* 125, 6933 (2021). [article]
 9. K.J. Cho, S. Gim, H.-K. Lim, C. Kim*, H. Kim, “Water slippage on graphitic and metallic surfaces: Impact of surface packing structure and electron density tail”, *J. Phys. Chem. C* 124, 11392 (2020). [article]
 10. K.-S. Kim, C. Kim*, G.E. Karniadakis, E.K. Lee, J.J. Kozak, “Density-dependent finite system-size effects in equilibrium molecular dynamics estimation of shear viscosity: Hydrodynamic and configurational study”, *J. Chem. Phys.* 151, 104101 (2019). [article]
 11. A. Donev, A. Nonaka, C. Kim, A.L. Garcia, J.B. Bell, “Fluctuating hydrodynamics of electrolytes at electroneutral scales”, *Phys. Rev. Fluids*. 4, 043701 (2019). [article]
 12. C. Kim*, A. Nonaka, J.B. Bell, A.L. Garcia, A. Donev, “Fluctuating hydrodynamics of reactive liquid mixtures”, *J. Chem. Phys.* 149, 084113 (2018). [article]
 13. K.-S. Kim, M.H. Han, C. Kim*, Z. Li, G.E. Karniadakis, E.K. Lee, “Nature of intrinsic uncertainties in equilibrium molecular dynamics estimation of shear viscosity for simple and complex fluids”, *J. Chem. Phys.* 149, 044510 (2018). [article]
 14. A. Donev, C.-Y. Yang, C. Kim, “Efficient reactive Brownian dynamics”, *J. Chem. Phys.* 148, 034103 (2018). [article]
 15. K.H. Han, C. Kim*, P. Talkner, G.E. Karniadakis, E.K. Lee, “Molecular hydrodynamics: Vortex formulation and sound wave propagation”, *J. Chem. Phys.* 148, 024506 (2018). [article]
 16. B. Choi, K.H. Han, C. Kim, P. Talkner, A. Kidera, E.K. Lee, “Nature of self-diffusion in two-dimensional fluids”, *New J. Phys.* 19, 123038 (2017). [article]
 17. C. Kim*, A. Nonaka, J.B. Bell, A.L. Garcia, A. Donev, “Stochastic simulation of reaction-diffusion systems: A fluctuating-hydrodynamics approach”, *J. Chem. Phys.* 146, 124110 (2017). [article]
 18. X. Bian, C. Kim, G.E. Karniadakis, “111 years of Brownian motion”, *Soft Matter* 12, 6331 (2016). [article]
 19. C. Kim, O. Borodin, G.E. Karniadakis, “Quantification of sampling uncertainty for molecular dynamics simulation: Time-dependent diffusion coefficient in simple fluids”, *J. Comput. Phys.* 302, 485 (2015). [article]
 20. C. Kim, G.E. Karniadakis, “Brownian motion of a Rayleigh particle confined in a channel: A generalized Langevin equation approach”, *J. Stat. Phys.* 158, 1100 (2015). [article]
 21. X. Li, Z. Li, X. Bian, M. Deng, C. Kim, Y.-H. Tang, A. Yazdani, G.E. Karniadakis, “Dissipative particle dynamics, overview” (2015). In B. Bhushan (Ed.), *Encyclopedia of Nanotechnology*, Springer, Dordrecht. [article]
 22. C. Kim, G.E. Karniadakis, “Time correlation functions of Brownian motion and evaluation of friction coefficient in the near-Brownian-limit regime”, *Multiscale Model. Simul.* 12, 225 (2014). [article]
 23. C. Kim, G.E. Karniadakis, “Microscopic theory of Brownian motion revisited: The Rayleigh model”, *Phys. Rev. E* 87, 032129 (2013). [article]
 24. H. Kim, W.A. Goddard III, K.H. Han, C. Kim, E.K. Lee, P. Talkner, P. Hänggi, “Thermodynamics of d -dimensional hard sphere fluids confined to micropores”, *J. Chem. Phys.* 134, 114502 (2011). [article]
 25. H.K. Shin, C. Kim, P. Talkner, E.K. Lee, “Brownian motion from molecular dynamics”, *Chem. Phys.* 375, 316 (2010). [article]
 26. C. Kim, P. Talkner, E.K. Lee, P. Hänggi, “Rate description of Fokker–Planck processes with time-periodic parameters”, *Chem. Phys.* 370, 277 (2010). [article]
 27. H. Kim, C. Kim, E.K. Lee, P. Talkner, P. Hänggi, “Wall-mediated self-diffusion in slit and cylindrical pores”, *Phys. Rev. E* 77, 031202 (2008). [article]
 28. C. Kim, E.K. Lee, P. Hänggi, P. Talkner, “Numerical method for solving stochastic differential equations with Poissonian white shot noise”, *Phys. Rev. E* 76, 011109 (2007). [article]
 29. C. Kim, E.K. Lee, P. Talkner, “Numerical method for solving stochastic differential equations with dichotomous noise”, *Phys. Rev. E* 73, 026101 (2006). [article]

30. H.J. Lee, C. Kim, J.G. Kim, E.K. Lee, “A general scheme for studying the stochastic dynamics of a parametric oscillator driven by coloured noise”, *J. Phys. A: Math. Gen.* 37, 647 (2004). [article]
31. J.-W. Lee, C. Kim, E.K. Lee, J. Kim, S. Lee, “Qubit geometry and conformal mapping”, *Quantum Information Processing* 1, 129 (2002). [article]

Presentations (since 2015)

At Professional Meetings (Invited)

1. *AMS Spring Western Sectional Meeting*, “Thermodynamically-consistent coupling of fluctuating hydrodynamics and kinetic Monte Carlo for gas-solid Interfaces”, (Fresno, CA, 2023).
2. *AMS Spring Western Sectional Meeting*, “Simulations of the formation and settling of marine aggregates”, (Fresno, CA, 2023). Listed as a co-author, Presented by F. Blanchette.
3. *SIAM Conference on Computational Science and Engineering (CSE23)*, “Thermodynamically-consistent coupling of fluctuating hydrodynamics and kinetic Monte Carlo for gas-solid Interfaces”, (Amsterdam, the Netherlands, 2023).
4. *SIAM Annual Meeting (AN22)*, “Stochastic multiscale simulation method for heterogeneous catalysts: Concurrent coupling of kinetic Monte Carlo and fluctuating hydrodynamics”, (Hybrid, Pittsburgh, PA, 2022).
5. *SIAM Conference on Computational Science and Engineering (CSE21)*, “Stochastic multiscale simulation method for heterogeneous catalysts: Concurrent coupling of kinetic Monte Carlo and fluctuating hydrodynamics” (Virtual, Fort Worth, TX, 2021).
6. *41st Stochastic Processes and their Applications Conference (SPA 2019)*, “Characterization of non-local and non-Markovian nature in the dynamics of a molecular fluid” (Evanston, IL, 2019).
7. *SIAM Conference on Computational Science and Engineering (CSE19)*, “Fluctuating hydrodynamics simulations of reactive electrolyte solutions” (Spokane, WA, 2019).
8. *SIAM Annual Meeting (AN18)*, “Fluctuating hydrodynamics approach toward realistic simulation of reactive microfluids” (Portland, OR, 2018).
9. *SIAM Conference on Mathematical Aspects of Materials Science (MS18)*, “Fluctuating hydrodynamics of reactive liquid mixtures” (Portland, OR, 2018).
10. *SIAM Conference on Computational Science and Engineering (CSE17)*, “Investigation of the molecular aspects of fluctuating hydrodynamics through the memory function approach” (Atlanta, GA, 2017).
11. *SIAM Conference on Computational Science and Engineering (CSE17)*, “Fluctuating hydrodynamics of reaction-diffusion systems” (Atlanta, GA, 2017).
12. *Mach Conference*, “Uncertainty quantification in molecular dynamics simulation of fluid systems: statistical errors and finite-system-size effects” (Annapolis, MD, 2016).
13. *DPD Workshop*, “Quantifying uncertainties in equilibrium particle dynamics simulations” and “Tutorial: Calculating material properties from LAMMPS” (Shanghai, China, 2015).
14. *Mach Conference*, “Uncertainty quantification on the evaluation of the diffusion coefficient from molecular dynamics simulation” (Annapolis, MD, 2015).
15. *SIAM Conference on Computational Science and Engineering (CSE15)*, “The long-time tail of the velocity autocorrelation function of a particle in a molecular fluid” (Salt Lake City, UT, 2015).

At Professional Meetings (Contributed)

1. *APS March Meeting 2023*, “Thermodynamically-consistent formulation of stochastic chemistry for modeling reactive gas dynamics at small scales”, (Hybrid, Las Vegas, NV, 2023). Listed as a co-author, Presented by M. Polimeno.
2. *10th International Conference on Multiscale Materials Modeling (MMM10)*, “Stochastic multiscale simulation method for heterogeneous catalysts: Concurrent coupling of kinetic Monte Carlo and fluctuating hydrodynamics”, (Baltimore, MD, 2022).
3. *SIAM Annual Meeting (AN22)*, “Characterizing the growth rate and fractal dimension of marine aggregates formed through Brownian dynamics”, (Hybrid, Pittsburgh, PA, 2022). Listed as a co-author, Presented by M. Polimeno.

4. *SIAM Annual Meeting (AN22)*, “Complete characterization of two-site adsorption / desorption processes: Finite system-size effect on equilibrium and time-transient surface coverage”, (Hybrid, Pittsburgh, PA, 2022). Listed as a co-author, Presented by E. Mercado.
5. *32nd International Symposium on Rarefied Gas Dynamics (RGD32)*, “Stochastic multiscale simulation method for heterogeneous catalysts: Concurrent coupling of kinetic Monte Carlo and fluctuating hydrodynamics”, (Hybrid, Seoul, Korea, 2022).
6. *APS (American Physical Society) DFD (Division of Fluid Dynamics) Annual Meeting*, “Modeling the formation mechanism and growth rate of aggregates through Brownian dynamics”, (Phoenix, Arizona, 2021). Listed as a co-author, Presented by M. Polimeno.
7. *LAMMPS Workshop and Symposium*, “Concurrent coupling of kinetic Monte Carlo and fluctuating hydrodynamics (SPPARKS-MUI-FHDeX)” (Virtual, Philadelphia, PA, 2021).
8. *Bernoulli-IMS 10th World Congress in Probability and Statistics*, “Statistical mechanical model of adsorption at a surface interface in contact with an ideal gas” (Virtual, Seoul, Korea, 2021).
9. *21st Symposium on Thermophysical Properties*, “Stochastic hybrid multiscale model for gas-solid interfacial systems” (Virtual, Boulder, CO, 2021).
10. *APS (American Physical Society) DFD (Division of Fluid Dynamics) Annual Meeting*, “Momentum fluctuations in coarse-grained fluid models” (Virtual, Chicago, IL, 2020). Listed as a co-author, Presented by M.R. Parsa.
11. *APS (American Physical Society) DFD (Division of Fluid Dynamics) Annual Meeting*, “A Brownian dynamics model for the formation of marine aggregates” (Seattle, WA, 2019). Listed as a co-author, Presented by F. Blanchette.
12. *ACS (American Chemical Society) Spring 2019 National Meeting & Expo*, “Fluctuating hydrodynamics of electrolytes at electroneutral scales” (Orlando, FL, 2019).
13. *Yosemite Fluids Meeting*, “Fluctuating hydrodynamics approach toward realistic simulation of reactive microfluids” (Wawona, CA, 2018).
14. *20th Symposium on Thermophysical Properties*, “Fluctuating hydrodynamics of reactive liquid mixtures” (Boulder, CO, 2018).
15. *Texas Applied Mathematics and Engineering Symposium*, “Stochastic simulation method for reactive microfluids under thermal fluctuations (Austin, TX, 2017).
16. *SIAM Annual Meeting (AN17)*, “Stochastic simulation of reaction-diffusion systems: Fluctuating hydrodynamic approach” (Pittsburgh, PA, 2017).
17. *SIAM Conference on Computational Science and Engineering (CSE15)*, “Uncertainty quantification for the estimation of the diffusion coefficient from MD Simulations”, Poster (Salt Lake City, UT, 2015).

At Educational, Governmental Institutions or Similar Organizations (Invited unless otherwise noted)

1. *Fritz Haber Institute of the Max Planck Society*, Theory Department, “Stochastic multiscale simulation methods for reactive microfluids and heterogeneous catalysts” (2022).
2. *Brown University*, Division of Applied Mathematics, “Learning stochastic dynamics with statistics-informed neural network” (2022)
3. *POSTECH*, Department of Mathematics, “Stochastic multiscale simulation methods for reactive microfluids and heterogeneous catalysts” (2022).
4. *University of Massachusetts, Amherst*, Department of Mathematics and Statistics, “Stochastic multiscale simulation methods for reactive microfluids and heterogeneous catalysts” (2021).
5. *Lawrence Berkeley National Laboratory (LBNL)*, Sustainable Research Pathways Workshop, “Development of Stochastic Hybrid Multiscale Models for Gas-Solid Interfacial Systems” (2020).
6. *Korea University*, Department of Mathematics, “Stochastic modeling: Toward realistic simulation of microfluidic, biological, and nanomaterial systems” (South Korea, 2018).
7. *Daegu Gyeongbuk Institute of Science and Technology (DGIST)*, School of Undergraduate Studies, “Scientific computing and modeling in multidisciplinary research” and “Computer simulation and stochastic multiscale modeling study on molecular dynamical systems” (South Korea, 2018).

8. *University of California, Merced*, Applied Mathematics Unit, “Toward realistic simulation of microfluidic, biological, and nanomaterial systems” (2018).
9. *University of California, Santa Cruz*, Applied Mathematics and Statistics Department, “Stochastic simulation method for reactive microfluids under thermal fluctuations” (2017).
10. *Brown University*, Division of Applied Mathematics, “Stochastic simulation method for reactive microfluids under thermal fluctuations” (2017).
11. *San Jose State University*, Department of Mathematics, “Simulating reactive fluids and reaction-diffusion systems at small scales” (2017).
12. *Pennsylvania State University*, Department of Mathematics, “Fluctuating hydrodynamics approach for the simulation of reactive fluids and reaction-diffusion systems at small scales” (2017).
13. *Stanford University, Summer School on Multiscale Modeling of Materials*, “Memory function approach and Brownian motion theory” (2016).
14. *Computational Science Research Center (CSRC)*, “Quantifying uncertainties in equilibrium particle dynamics simulations” and “Tutorial: Calculating material properties from LAMMPS” (Beijing, China, 2015).
15. *Lawrence Berkeley National Laboratory (LBNL)*, Computing Sciences, “Analysis and simulation of molecular systems: Memory function approach and uncertainty quantification” (2015).
16. *Columbia University*, Applied Physics and Applied Mathematics, “Analysis and simulation of molecular systems: Memory function approach, effects of confinement, and uncertainty quantification” (2015).

Computer Software Distribution

1. J.B. Bell, A. Nonaka, C. Kim, D. Ladiges, A. Donev, “Stochastic Hybrid Models and Algorithms for Fluids (FHDeX) v1”, DOE Code (2019). [DOI] [git repository]
2. A. Donev, C.-Y. Yang, C. Kim, “SRBD: Stochastic Reactive Brownian Dynamics” (2017). [git repository]

Computing Cluster Experience

DOE User Facilities: National Energy Research Scientific Computing Center (NERSC), Argonne Leadership Computing Facility (ALCF), Oak Ridge Leadership Computing Facility (OLCF)

UC Merced: Pinnacles cluster, MERCED cluster

Grants

Funded Extramural Grants

1. *Department of Energy (DOE), Advanced Scientific Computing Research (ASCR), Funding for Accelerated, Inclusive Research (FAIR)*, “Machine-Learning-Based Surrogate Modeling for Stochastic Multiscale Simulation Methodology”, PI, \$750,000, 3 years (July 2023 – June 2026). [Award No. A24-0050-001]
2. *National Science Foundation (NSF), Division of Chemistry (CHE), Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences*, “LEAPS-MPS: Stochastic Particle-Continuum Hybrid Simulation Method for Model Heterogeneous Catalysts under Reaction Conditions”, PI, \$249,865, 2 years (August 2022 – July 2024). [Award No. 2213368]
3. *Foundation for California Community Colleges, California Learning Lab, The Grand Challenge Overcoming the Calculus Barrier to STEM Success*, “Why, What and How” Calculus, Co-PI, \$1,400,000, 3 years (July 2021 – June 2024).

Funded Internal Grant (UC Merced)

1. *Academic Senate Faculty Research Grants program*, “Multiscale Modeling of Cell Membrane Electroporation”, PI, \$10,000, 2 years (July 2019 – June 2021).

Sponsored Research

1. *Sustainable Research Pathway Program, Summer Research at Lawrence Berkeley National Lab*, “Numerical Coupling of Fluctuating Hydrodynamics with Surface Chemistry (Year 2)”, PI, \$48,720, Fellowship for PI (C. Kim) and two graduate students, June 2022 – August 2022.

2. *Sustainable Research Pathway Program, Summer Research at Lawrence Berkeley National Lab*, “Numerical Coupling of Fluctuating Hydrodynamics with Surface Chemistry (Year 1)”, PI, \$36,000, Fellowship for PI (C. Kim) and two graduate students, June 2021 – August 2021.

Professional Development Fellowships

1. *UC Merced, NCFDD Summer Faculty Success Program Fellowship*, \$4,450, Summer 2022.
2. *UC Merced, Faculty Success Initiative - Extramural Funding Fellowship (FSI-EFF)*, \$3,000, 2021.

Awards and Scholarships

Sigma Xi Award	2015
Dunmu Ji Award (Division of Applied Mathematics, Brown University)	2015
Korea Government Scholarship: Study Abroad Program	2010 – 2012
NRF (National Research Foundation of Korea) – DAAD (German Academic Exchange Service) Graduate Student Exchange Program (Mentors: Peter Hänggi and Peter Talkner, University of Augsburg, Germany)	2005

Teaching (since 2018)

UC Merced

Linear Algebra & Differential Equations (MATH 24, lower-division course)	Fall 2023, Fall 2022, Spring 2020
Real Analysis (MATH 101, upper-division course)	Spring 2023
Numerical Linear Algebra (MATH 146, upper-division course)	Spring 2021, Spring 2019
Stochastic Processes (MATH 181, upper-division course)	Spring 2022
Numerical Analysis I (MATH 231, graduate course)	Fall 2021, Fall 2020, Fall 2019

Teaching Workshops Attended

Boost Student Learning (UC Merced, Spring 2022, weekly)
Faculty Learning Community (UC Davis / UC Merced, AY20-21)
Online Summer Institute on Scientific Teaching (National Institute on Scientific Teaching, 7/20-7/24/2020)
Scientific Teaching: Small Changes to Impact Your Classroom Tomorrow (UC Merced, 1/17/2020)
Engaged Teaching and Learning in the Sciences (UC Merced, Fall 2018)

Student Research Mentoring

Graduate Students

Matteo Polimeno (co-advised by F. Blanchette)	May 2020 – present
Zihan Xu	August 2022 – present
Indar Freitas	August 2022 – present
Yibing Wang (co-advised by E. Rutter)	August 2022 – August 2023
Enrique Mercado	June 2020 – August 2022

Undergraduate Students

Patrick Park	June 2023 – present
Enrique Mercado	June 2019 – May 2020
Arnold Khampaseut	May 2021 – July 2021
Indar Freitas	May 2021 – July 2021

Visiting Students

Hyun Tae Jung (Chemistry, KAIST)	August 2022 – August 2023
Marc Mancini (Master thesis project, École Polytechnique)	April 2019 – August 2019

External Mentoring

Hyun Tae Jung (Ph.D. student, Chemistry, KAIST)	April 2021 – present
Guy Moore (Undergraduate student, University of the Pacific)	June 2018 – August 2019
Kang-Sahn Kim (Ph.D. student, Chemistry, KAIST)	September 2015 – February 2019
Kyeong Hwan Han (Ph.D. student, Chemistry, KAIST)	September 2015 – August 2018
Bongsik Choi (Ph.D. student, Chemistry, KAIST)	September 2017 – February 2018

Serving as a Thesis Committee Member

Applied Math: Tri Nguyen, Jared Stewart, Eunji Yoo, Amandeep Kaur, Scott West, Matthew Blomquist, Hardeep Bassi
 Chemistry: Hanbo Hong, Vincent Aguirre

Postdoc Supervision

M. Reza Parsa

May 2019 – April 2021

Yuanran Zhu (Visiting Assistant Professor)

January 2020 – May 2022

University Service**Department Level****Committees**

Faculty Search Committee	AY22-23
Graduate Admissions Committee	AY19-20, AY18-19
Search Committee for Visiting Assistant Professor	AY20-21
Search Committee for Departmental Postdoc	AY21-22
Preliminary Exam Committee	AY22-23, AY21-22, AY20-21, AY19-20
Graduate Fellowship Awards Committee	AY23-24, AY22-23, AY18-19
Distant Course Delivery Facilitation Taskforce	Spring 2020 – Fall 2020

Department Website Administrator

Fall 2018 – present

Seminar Coordination

Scientific Computing and Data Science Seminar	Spring 2023, Fall 2022, Spring 2022
Applied Mathematics Seminar	Fall 2019

“Problem of the Month”, Organizer

Fall 2021 – present

To stimulate student engagement in math, every month during the semester, undergraduate students are invited to solve a challenging math problem posted on the Applied Math department website. Noteworthy solutions are recognized and awarded prizes. There are monthly gatherings for students to present and discuss their solutions. Math problems are carefully constructed so that students can apply both their analytical and computational math skills. [webpage]

“Math-Magic” Event, Organizer

Fall 2021 – present

In the beginning of each academic year, undergraduates with math or other STEM majors are invited to the event. Students participate in intriguing math activities with applied math faculty and graduate students. In addition, there is an information session for resources, opportunities, and events that are offered by the Applied Mathematics department.

Faculty Advisor of Math Club

Fall 2023 – present

School Level**Committee**

Departmental Instructional Contacts Committee	AY20-21
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Professional Service**Conference Organization**

- International Conference on Molecular Simulation (ICMS 2019) November 2019
 Organizing Committee Member
 A total of 440 researchers from 22 countries attended and a total of 320 presentations were delivered.

Special Session / Minisymposium Organization

- AMS Spring Western Sectional Meeting, Special Session Organizer May 2023
 Special Session on Scientific Computing
- SIAM CSE23 Conference, Minisymposium Organizer February 2023
 “Stochastic and Multiscale Modeling Approaches for Interfacial Systems”
- SIAM AN22 Conference, Minisymposium Organizer July 2022
 “Stochastic Modeling and Simulation Methods in Biology and Chemistry”
- SIAM CSE21 Conference, Minisymposium Co-organizer March 2021

“Mesoscopic and Microscopic Modeling of Hydrodynamics of Complex Fluids”

- AMS Spring Western Sectional Meeting, Special Session Organizer
Special Session on Scientific Computing (Cancelled due to COVID19)

May 2020

Program Organization

- Broader Engagement Program at SIAM MDS22 (BE@MDS22), Application Chair / Organizing Committee Member
- Broader Engagement Program at SIAM CSE21 (BE@CSE21), Application Chair / Organizing Committee Member
The BE Program is intended to better engage groups consistently underrepresented in STEM by providing a rich scientific program, mentoring, and career and professional development at a chosen SIAM conference. The BE program also aims to transform mainstream Science and Technology communities by normalizing inclusion. Through BE@CSE21 and BE@MDS22, more than 120 undergraduate and graduate students from various backgrounds (racial and ethnic minorities, people with disabilities, first-generation college students) were supported to attend the conference and participate in the BE events. [webpage]

Mentoring

- Cal-Bridge Program, UC Faculty Mentor (AY22-23, AY23-24)
The Cal-Bridge program creates opportunities for members of historically underrepresented groups, including women, underrepresented minorities (URMs), members of the LGBTQ+ community, those with disabilities, and first generation students, to participate and advance in STEM fields including physics, astronomy, computer science/engineering, and mathematics, to increase their numbers in PhD programs targeting the UC and other partner institutions.
- Affinity Group Leader (Topic: Reduced-Order Modeling) at SIAM CSE23
Affinity Groups at SIAM Conferences are designed to help student participants get more out of SIAM conference sessions. Led by group leaders, these groups explore conference topics from an entry level perspective by meeting prior to the conference session, attending the conference session together, and then meeting afterwards.

Panel Review

NSF DMS panel (Spring 2021)

Peer review

Journal of Computational Physics, Chemical Engineering Science, Journal of Fluid Dynamics, Physical Review E, Scientific Reports, Nonlinearity, Journal of the Royal Society Interface, Communications in Applied Mathematics and Computational Science (CAMCoS), Physics of Fluids, SIAM Review, European Physical Journal B, Journal of Statistical Physics, Journal of Molecular Liquids, Journal of Nonlinear Science

Seminar Coordination

Monthly Seminar of KSEA (Korean-American Scientists and Engineers Association) Berkeley Chapter 2016 – 2018

Professional Memberships

Society for Industrial and Applied Mathematics (SIAM) 2012 – present
Korean-American Scientists and Engineers Association (KSEA) 2015 – present
American Mathematical Society (AMS), Bernoulli Society for Mathematical Statistics and Probability, American Chemical Society (ACS), American Physical Society (APS), Biophysical Society (BPS)
National Math Alliance, Pacific Math Alliance

Community Engagement

Applied Math Challenge for High School Students Summer 2022
Local high school students were invited to participate in a two-week-long mathematical challenge working collaboratively with other students under the mentorship of a UC Merced graduate student mentor. The graduate student mentors assisted students to understand core mathematical ideas as the team works on creating a poster presentation on their methods and results for solving a real-world problem.

Merced Math Teachers' Circle (MMTC), Leadership Team Member 2019 – present
MMTC connects K-12 mathematics teachers, college and university mathematics professors, and all mathematics educators in the Central Valley area of California centered around Merced, whose students are traditionally underrepresented in STEM. Through regular meetings with fun, creative, and meaningful math problem-solving activities,

the participants share and (re-)experience the excitement of doing mathematics so that they may bring that enthusiasm into their own classrooms.

Teaching Korean Language to American Adults at Rhode Island Korean School

2011 – 2015