Sungju Moon

Curriculum Vītae

Contact Information

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Research Interests

Applications of nonlinear dynamics and chaos theory
Numerical weather modeling, atmospheric predictability, and data assimilation
Agent-based modeling applications including infectious disease modeling
Scholarship of teaching and learning mathematics

Education

Seoul National University, Seoul, South Korea
Ph.D. in Earth and Environmental Sciences, Aug 2021
Dissertation: *High-Dimensional Lorenz Systems, Atmospheric Predictability, and Data Assimilation*
Advisor: Jong-Jin Baik

Syracuse University, Syracuse, NY, USA
M.S. in Mathematics, May 2016

Wake Forest University, Winston-Salem, NC, USA
B.S. in Mathematics (Honors) and B.A. in Classical Studies, May 2013
Honors thesis: *Computational Modeling of Precautionary Behavior During an Epidemic*

Academic Appointments

Assistant Professor of Mathematics — Jan 2023–Present
Department of Data, Media, and Design, Nevada State University — Henderson, NV, USA

Postdoctoral Fellow — Apr 2022–Dec 2022
Department of Mathematics & Statistics, McMaster University — Hamilton, ON, Canada
Mathematics for Public Health (MfPH) Network, The Fields Institute

Postdoctoral Fellow — Sep 2021–Mar 2022
Research Institute for Basic Sciences, Seoul National University — Seoul, South Korea

Technical Research Personnel (South Korean Military Service) — Sep 2018–Aug 2021
Seoul National University — Seoul, South Korea

Grant Applications & Awards (as PI)

Atmospheric Predictability—From the Perspective of Chaos Theory
National Research Foundation of Korea (NRF), Postdoctoral Training Grant
Amount: $120,000; Period: Sep 2021–Aug 2023
Funded; relinquished Apr 2023

Nevada State Mathematics Festival and Competition for Southern Nevada Students
Nevada Governor's Office of Science, Innovation and Technology (OSIT)
Amount: $31,434 requested; Period: AY 2024–25
Declined

NSU–Pima Collaboration for Student Research Projects
NSF Center for Undergraduate Research in Mathematics (CURM), Occidental College
Amount: $7,300 + $15,000 in student stipends; Period: AY 2025–26
Funded; in partnership with Pima Community College

Courses Taught

At Nevada State University *Ind. Study, **Co-teaching, †TRIO-McNair, ‡CURM Minigrant
Abstract Algebra I (MATH 453), Su '26*
Advanced Mathematical Topics (Capstone, MATH 489), Fall '26
Calculus I (MATH 181), Fall '23, Spring/Fall '24, Spring/Fall '25, Spring/Fall '26
Differential Equations (MATH 427), Fall '23, Fall '24*, Fall '25
Elementary Complex Analysis (MATH 459), Fall '24

Fundamentals of College Mathematics (MATH 120), Spring '23
Fundamentals of College Mathematics Expanded (MATH 120E), Spring '24, Fall '24, Spring '25
History of Mathematics (MATH 314), Spring '24, Fall '26
Introduction to Statistics (STAT 152), Fall '25
Linear Algebra I (MATH 330), Spring '23, Spring '24*, Spring/Fall '25, Fall '26*
Linear Algebra II (MATH 430), Fall '23
Mathematical Modeling (MATH 420), Su'26*,†
Probability and Statistics (MATH 352), Spring '26
Special Topics: Advanced Topics in Algebra (MATH 389), Spring '26**
Undergraduate Research (MATH 498), Su'24*,†, Spring/Fall '25*, Su'25*,†, Spring '26*,‡

At McMaster University
Linear Algebra I (MATH 1B03), Fall '22 (Online)

At Syracuse University
Algebraic Operations and Functions (MAT 112), Summer '15
Calculus I (MAT 295), Fall '14
Calculus for Life Sciences II (MAT 286), Spring '16

Other Teaching Experiences

As Teaching Assistant, Seoul National University
Atmospheric Physics II (Undergraduate, Online), Fall '21
Cloud Physics (Graduate), Fall 2017, Fall 2018, Fall '20 (Online)
Mesoscale Meteorology (Graduate), Spring '18
Topics in Atmospheric Science (Graduate), Spring '20 (Online)

As Recitation Instructor, Syracuse University
Business Calculus (MAT 284), Spring '15
Calculus I (MAT 295), Fall 2015, Spring '15
Calculus II (MAT 296), Spring '14
Elementary Probability and Statistics I (MAT 121), Fall '13

As Math Clinic Tutor, Syracuse University (Fall '13–Spring '16)

Student Research Supervision & Mentorship

At Nevada State University
A.B. (Summer '25)
- Explored network-based rumor modeling

A.M. (Capstone, Fall '26)
- EOF analysis of weather variables influencing Lake Mead's water level

B.C.S. (Center for Undergraduate Research in Mathematics, Fall '25–Spring '26)
- Developed an agent-based rumor mutation model to study the impact of extreme rumors

C.C. (TRIO-McNair Summer Research Institute '25)
- Developed a dynamical model of algae growth and harvesting and analyzed laboratory data
- Virtual presentation at an AMATYC meeting (Nov '25)

E.F. (Independent Study, Summer '25–Spring '26)
- Explored high-dimensional chaos synchronization in Lorenz-like systems

H.S. (Independent Study, Fall '25)
- Explored catastrophe theory, tipping points, and chaos theory

I.M. (Center for Undergraduate Research in Mathematics, Fall '25–Spring '26)
- Developed an agent-based model of rumor spread featuring social influence
- Oral presentation at MAA Sectional Meeting

J.C.-S. (Capstone, Fall '26)
- EOF analysis of weather variables influencing Lake Mead's water level

J.R. (Independent Study, Spring '25)
- Developed a new ABM framework in `C++` (ABMoid)

L.L. (Capstone, Fall '26)

• Ensemble Kalman filter applied to an agent-based dynamic model of learning and survey data

M.G. (INBRE iSurf-Flex summer program '24, continued through Summer '25)

• Developed an agent-based model of viral mutation
• Oral presentation at ASA Regional
• Virtual presentation at an AMATYC meeting (Nov '25)

N.S. (TRIO-McNair Summer Research Institute '24, '25 & '26; Capstone, Fall '26)

• Developed a dynamical modeling of learning based on survey data
• Virtual presentation at an AMATYC meeting (Nov '25)
• Ensemble Kalman filter applied to an agent-based dynamic model of learning and survey data

R.C.W. (Center for Undergraduate Research in Mathematics, Fall '25–Spring '26)

• Developed SIR-inspired rumor models featuring rumor mutation and social influence

R.R. (INBRE iSurf-Flex summer program '24)

• Developed a network-based infectious disease model

R.P. (INBRE iSurf-Flex summer program '24)

• Analyzed parameter spaces for various infectious disease models

T.P. (Independent Study, Spring '26)

• Simulated stochatic cloud droplet growth with absorption and shattering and analyzed observations using soap bubbles

At Seoul National University

S.-H.H. (undergraduate thesis '19)

• Numerical Exploration of Coexistence in the Lorenz–Stenflo Equations
• Peer-reviewed publication

T.K. (undergraduate thesis '21)

• The Relation Between Computational Accuracy and Predictability of the 6D Lorenz System Using Various Orders of the Runge–Kutta Method

Funded Research Projects

Hollow Inverse Eigenvalue Problems and Zero Forcing July 2026–Present
Research Experiences for Undergraduate Faculty (REUF), AIM & ICERM
NSF Award No. 2015462; PIs: Leslie Hogben and Brianna Donaldson
Role: Participating researcher; collaboration with Leslie Hogben and Sarita Nemani
Investigating hollow minimum rank, maximum nullity, and zero forcing for graph families, with an emphasis on developing new results and undergraduate research problems.

Mathematical Modeling of Rumor Generation and Propagation July 2025–June 2026
Center for Undergraduate Research in Mathematics (CURM) Minigrant
NSF-supported program administered through Occidental College
Role: co-PI in partnership with Teresa Mullen (Pima Community College)
Collaborative research between two- and four-year institutions, involving undergraduate students in mathematical and computational modeling of rumor dynamics.

Mathematics for Public Health Project 4:
Robust Agent-Based and Network Infectious Disease Models Apr 2022–Dec 2023
Mathematics for Public Health (MfPH), The Fields Institute
NSERC Emerging Infectious Disease Modelling Initiative
PIs: Thomas Hurd (1956–2022) and Michael C. Wolfson (uOttawa)
Developed compartmental and agent-based models of infectious disease transmission, investigating co-circulation, social networks, and data availability.

Atmospheric Predictability: From the Perspective of Chaos Theory Sep 2021–Apr 2023
National Research Foundation of Korea (NRF), Postdoctoral Training Grant
Role: PI (with J.-J. Baik as mentor)
Grant relinquished upon international relocation
Investigated the relationship between atmospheric chaos and predictability, focusing on model resolution and numerical precision.

Chaos and Synchronization in High-Order Lorenz Models Nov 2018–Oct 2021
Small Grant for Exploratory Research (SGER), National Research Foundation of Korea (NRF)
PI: Jong-Jin Baik (Seoul National University)
Derived and analyzed high-dimensional extensions of the Lorenz system, investigating bifurcations and chaos synchronization.

Mathematical Modeling in Epidemiology Sep 2011–May 2013
2012 URECA Summer Research Fellowship, Wake Forest University
Faculty mentors: Frederick Chen and Miaohua Jiang (Wake Forest University)
Undergraduate honors research developing a computational epidemiological model incorporating adaptive risk behavior.

Other Projects & Collabs.

Effects of Climate Change on Mesoscale Predictability Jan 2026–Ongoing
In collaboration with Han-Gyul Jin (Pusan National University)
Investigating changes in the short-term predictability of extreme rainfall under pseudo-global-warming conditions, with particular attention to initial-condition uncertainty and insights from chaos theory.

Special Topics Course Development (MATH 389) 2025–Ongoing
Collaborative development of a flexible co-teaching structure for advanced special topics in mathematics. Developed and co-taught *Advanced Topics in Algebra* (Spring 2026); currently developing *Partial Differential Equations, Fluid Dynamics, and Chaos* (Spring 2027).

Communicating Mathematical Beauty (MATH 129) Apr 2024–Ongoing
In collaboration with Chris Harris (NSU)
Developing a course introducing deeper mathematical ideas to non-STEM majors through exploration and creative expression, together with an accompanying textbook, *Am I a Math Person?*

Applied Statistics Curriculum Development Jan 2024–Ongoing
In collaboration with Aaron Wong (NSU)
Designed and developed Applied Statistics I and II, the core project-oriented courses for the new interdisciplinary Applied Statistics minor at Nevada State University.

Markov vs. Nekrasov: A Reacting-to-the-Past Game Dec 2023–Ongoing
Co-authors: Chad Curtis (NSU, lead), Linda Mayhew (UT Austin)
Developing *Markov vs. Nekrasov: Markov Chains, the Central Limit Theorem, and the Battle Over Free Will*, a historical role-playing game exploring the development of probability and statistics and debates surrounding determinism and free will.

Kneading-Based Exploration of Lorenz-like Systems Nov 2021–Ongoing
In collaboration with Roberto Barrio et al. (University of Zaragoza, Spain)
Investigating the global bifurcation structure of higher-dimensional Lorenz systems using kneading invariants, including homoclinic and heteroclinic structures not readily identified through conventional parameter scans.

Effects of Pandemic-Induced Restrictions on Air Quality Jul 2020–Mar 2021
In collaboration with Jong-Jin Baik (Seoul National University)
Analyzed changes in urban air quality during COVID-19 restrictions in South Korea using air-quality monitoring data; research contributed to two peer-reviewed publications.

Publications

Journal Articles (*student/mentee involvement)

17. (In Review) S. Moon, C. Curtis, M. Iommi, 2026. Collaborative authorship and game-based learning in a history of mathematics course.

16. H. Lee, G. Ganbat, H.-G. Jin, J.M. Seo, S. Moon, H. Bok, J.-J. Baik, 2023. Effects of Lake Baikal on summertime precipitation climatology over the lake surface. *Geophysical Research*

Letters 50, e2023GL103426.

15. S. Moon, J.-J. Baik, H.-J. Song, J.-Y. Han, 2022. Increasing model vertical resolution may not necessarily lead to improved atmospheric predictability. *Chaos* 32, 073120.

14. S. Moon, J.-J. Baik, 2021. Using the $(3N)$-dimensional generalized Lorenz systems as a testbed for data assimilation: The ensemble Kalman filter. *Monthly Weather Review* 149, 3691–3705.

13. K.-H. Kwak, B.-S. Han, K. Park, S. Moon, H.-G. Jin, S.-B. Park, J.-J. Baik, 2021. Inter- and intra-city comparisons of $PM_{2.5}$ concentration changes under COVID-19 social distancing in seven major cities of South Korea. *Air Quality, Atmosphere & Health* 14, 1155–1168.

12. J. Park, S. Moon, J.M. Seo, J.-J. Baik, 2021. Systematic comparison between the generalized Lorenz equations and DNS in the two-dimensional Rayleigh–Bénard convection. *Chaos* 31, 073119.

11. M. Jwa, H.-G. Jin, J. Lee, S. Moon, J.-J. Baik, 2021. Characteristics of raindrop size distribution in Seoul, South Korea according to rain and weather types. *Asia-Pacific Journal of Atmospheric Sciences* 57, 605–617.

10. S. Moon, J.-J. Baik, S.-H. Hong,* 2021. Coexisting attractors in a physically extended Lorenz system. *International Journal of Bifurcation and Chaos* 31, 2130016 (Featured).

9. S. Moon, J.-J. Baik, J.M. Seo, 2021. Chaos synchronization in generalized Lorenz systems and an application to image encryption. *Communications in Nonlinear Science and Numerical Simulation* 96, 105708.

8. S. Moon, J.-J. Baik, J.M. Seo, B.-S. Han, 2021. Effects of density-affecting scalar on the onset of chaos in a simplified model of thermal convection: A nonlinear dynamical perspective. *The European Physical Journal Plus* 136, 92.

7. B.-S. Han, K. Park, K.-H. Kwak, S.-B. Park, H.-G. Jin, S. Moon, J.-W. Kim, J.-J. Baik, 2020. Air quality change in Seoul, South Korea under COVID-19 social distancing: Focusing on $PM_{2.5}$. *International Journal of Environmental Research and Public Health* 17, 6208.

6. S. Moon, J.M. Seo, J.-J. Baik, 2020. High-dimensional generalizations of the Lorenz system and implications for predictability. *Physica Scripta* 95, 115201.

5. J.M. Seo, H. Lee, S. Moon, J.-J. Baik, 2020. How mountain geometry affects aerosol-cloud-precipitation interactions: Part I. Shallow convective clouds. *Journal of the Meteorological Society of Japan* 98, 43–60.

4. S. Moon, J.M. Seo, B.-S. Han, J. Park, J.-J. Baik, 2019. A physically extended Lorenz system. *Chaos* 29, 063129 (Featured).

3. Y.-L. Jeon, S. Moon, H. Lee, J.-J. Baik, J. Lkhamjav, 2018. Non-monotonic dependencies of cloud microphysics and precipitation on aerosol loading in deep convective clouds: A case study using the WRF model with bin microphysics. *Atmosphere* 9, 434.

2. J.M. Seo, J.-J. Baik, S. Moon, 2018. Orographic-convective flows, wave reflection, and gravity-wave momentum fluxes in a two-layer hydrostatic atmosphere. *Tellus* 70A, 1–16.

1. S. Moon, B.-S. Han, J. Park, J.M. Seo, J.-J. Baik, 2017. Periodicity and chaos of high-order Lorenz systems. *International Journal of Bifurcation and Chaos* 27, 1750176.

Book Chapters & Conference Proceedings

2. S. Moon, M. Wolfson, 2025. Exploring the Chaotic Dynamics of Cocirculating Disease Strains: Toward Agent-Based Modeling. In: Skiadas, C.H., Y. Dimotikalis. *16th Chaotic Modeling and Simulation International Conference*, Springer: 435–448.

1. J. David, G. Brankston, I. Sekkak, S. Moon, X. Li, S. Jahedi, Z. Mohammadi, A. Li, M. Grunnil, P. Song, W. Assefa, N. Bragazzi, J. Wu, 2023. Mathematical models: perspectives of mathematical modelers and public health professionals. In: J. David, J. Wu, 2023. *Mathematics of Public Health: Mathematical Modelling from the Next Generation*, Springer: 1–35.

Talks & Seminars

Invited Seminars

Exploring high-dimensional Lorenz systems, Monthly Virtual Mathematical Exploration Research Forum (MERF), American Mathematical Association of Two-Year Colleges (AMATYC) Research & Mentoring Experiences for Students and Faculty Academic Network (RMESF ANet), Aug 15, 2025, Online

A comparison of generalized Lorenz models to the Boussinesq model and investigations into chaotic properties, TRR 181 Seminar, University of Hamburg, Germany, May 25, 2023, Online

Chaos synchronization and data assimilation, Department of Atmospheric Science, Yonsei University, Seoul, South Korea, Sep 28, 2021, Online

Chaos and atmospheric predictability, Department of Atmospheric Science, Kongju National University, Kongju, South Korea, Sep 14, 2021

Chaos synchronization in high-dimensional Lorenz systems, School of Computing and Data Science, Wentworth Institute of Technology, Boston, MA, Jan 13, 2021, Online

Workshops

(with Chad Curtis) *Reacting to the Past: Historical Roleplaying Games in Math Education*, MAA MathFest 2025, Sacramento, CA, Aug 7, 2025

(with Aaron Wong) *Breakout Session: Grading Strategies*, UNLV STEM Meet 2025, Las Vegas, NV, Feb 7, 2025

Conference/Meeting Talks (⋆student presentation)

(with Isabella Moreno⋆ as speaker) *How social dynamics affect rumor model*, 2026 ArizMATYC/MAA Southwestern Section Joint Conference, Phoenix, AZ, Mar 2026

The case for undergraduate research at a teaching-focused university, The Inaugural Meeting of the Nevada Chapter of the Korean-American Scientists & Engineers Association (KSEA) and 2026 NV Interdisciplinary Research Symposium, Las Vegas, NV, Mar 2026

(with Chad Curtis as speaker) *LARPing with Lagrange: math meets reacting to the past*, MAA MathFest 2025, Sacramento, CA, Aug 8, 2025

Exploring kneading numbers of an extended Lorenz system, 18$^{\text{th}}$ CHAOS 2025 International Conference, Athens, Greece, Jun 2025, Online

(with Mary Giles⋆ as speaker) *Agent-based modeling of viral mutations*, 2024 Fall Symposium, "Health and Human Services", Nevada Chapter of the American Statistical Association (ASA), Las Vegas, NV, Oct 2024

Math history spillover, New Twists on Your Favorite Math Circle Activity, MathFest 2024, Indianapolis, IN, Aug 2024, *Withdrawn due to medical reasons*

(with M. C. Wolfson as speaker) *Toward support for epidemic preparedness via digital twin data*, The Canadian Network for Modelling Infectious Diseases: Progress and Next Steps (23w5151), Banff International Research Station (BIRS) for Mathematical Innovation and Discovery, Banff, AB, Canada, Nov 2023

Exploring the chaotic dynamics of two interacting viral strains: agent-based modelling approach, 16^{th} CHAOS 2023 International Conference, Heraklion, Crete, Greece, Jun 2023, Online

Explorations in interacting infectious disease modelling, Poster (with Michael C. Wolfson and Steve Gribble), Mathematics for Public Health Festival (MfPHest), The Fields Institute, Toronto, ON, Canada, Oct 2022

Chaos synchronization in generalized Lorenz Systems and connections to data assimilation, 15^{th} CHAOS 2022 International Conference, Athens, Greece, Jun 2022, Online

The $(3N)$*- and* $(3N+2)$*-dimensional generalizations of the Lorenz system, chaos synchronization, and their applications as a testbed Model for data assimilation algorithms*, AMS Contributed Paper Session on Dynamical Systems and Applications, Joint Mathematics Meetings, Seattle, WA, USA, Apr 2022, Online

High-dimensional Lorenz systems, atmospheric predictability, and data assimilation: An overview, Autumn Meeting of the Korean Meteorological Society, Special Session for Emerging Scientists, Gwangju, South Korea, Oct 2021, Online

The generalized Lorenz systems: A new testbed model for data assimilation, Autumn Meeting of the Korean Meteorological Society, Gwangju, South Korea, Oct 2021, Online

Attractor coexistence in extended Lorenz systems revealed through bifurcation analysis, 14^{th} CHAOS 2021 International Conference, Athens, Greece, Jun 2021, Online

High-dimensional generalizations of the Lorenz system and implications for predictability, Autumn Meeting of the Korean Meteorological Society, Gyeongju, South Korea, Oct 2020, Online

The $(3N)$*- and* $(3N+2)$*-dimensional generalized Lorenz systems*, 13^{th} International Conference on Chaotic Modeling, Simulation and Applications, CHAOS 2020, Florence, Italy, Jun 2020, *Withdrawn due to global pandemic*

A physically extended Lorenz system, Autumn Meeting of the Korean Meteorological Society, Gyeongju, South Korea, Oct 2019

A physically extended Lorenz system, 1^{st} International Conference on Climate Change and Environment in Central and North-East Asia (ICCCECNEA), National University of Mongolia, Ulaanbaatar, Mongolia, Sep 2019

Non-monotonic dependence of cloud microphysics and precipitation on aerosol loading in deep convective clouds: A case study using the WRF-bin model (with Y.-L. Jeon), Poster, 15^{th} Conference on Cloud Physics/Atmospheric Radiation, American Meteorological Society, Vancouver, BC, Canada, Jul 2018

Chaos and periodicity of high-order Lorenz systems, Autumn Meeting of the Korean Meteorological Society, Busan, South Korea, Oct 2017

Internal Talks

Threading sustainability into your curriculum (with J. Edmonds – lead, K. Corsaro, E. Hoover, R. Perez, G. Rum, A. Varga, C. Way), 5^{th} Annual Faculty Symposium on Teaching and Learning, Nevada State University, Henderson, NV, Jan 12, 2024

Journey from cloud modeling to the Lorenz equations—the microphysical and dynamical effects of aerosols, AIMS Lab Seminar, Department of Mathematics & Statistics, McMaster University, Hamilton, ON, Canada, Sep 26, 2022

Honors & Awards

The KMS Award for Outstanding Dissertation Sep 2021
Korean Meteorological Society (KMS)

Best Ph.D. Dissertation Award Aug 2021
College of Natural Sciences, Seoul National University

Pi Mu Epsilon, Wake Forest University Inducted 2013

Service to Institution

Committee Work

School of Liberal Arts, Sciences, and Business, Alumni Engagement Subcommittee, Fall 2026–Present
Mathematics Program Assessment Committee, 2024–Present
Foundation Scholarship Application Review, Apr–Jun 2024

Other Institutional Service

Faculty Advisor, Mathematics and Data Science Club, Spring 2026–Present
Editor, Mathematics Program Newsletter (semesterly), Fall 2025–Present
NSHE Data Science/Statistics Working Group in collaboration with the UT Dana Center, Fall 2025
Volunteer, MathRocks! monthly K–12 mathematics competitions, Spring 2025–Present
First Point-of-Contact Program for Mathematics Majors, including alumni follow-ups, Fall 2024–Present
Applied Statistics Minor administrative proposal (lead: Andrew Lavengood), Spring 2024–Spring 2026
Organizer, Nevada State Mathematics Colloquium (link), Fall 2023–Present
Nevada State University Open House, every Fall semester since 2023

Service to Profession

Conference Activities

MAA MathFest 2025 Contributed Paper Session, SoTL: Focus on Game-based Learning, Lead Organizer, Dec 2024–Aug 2025
UNLV STEM Ed Meet 2025, Organizing Committee, Feb 2024–Feb 2025
MAA MathFest 2024 Project NExT Session on Grant Writing, Session Organizer, Feb–Aug 2024
West Coast Number Theory (WCNT) Conference 2023, On-Site Volunteer, Dec 2023
Mathematics for Public Health Festival (MfPHest), Organizing Committee, Jun–Oct 2022
15$^{\text{th}}$ International Conference on Chaotic Modeling, Simulation and Applications (CHAOS 2022), Special and Contributed Session: Chaos Theory–Quantum–Lorenz, Session Chair, Jun 2022

Journal Refereeing

Atmosphere
Climate Dynamics
IEEE Transactions on Network Science and Engineering
International Journal of Bifurcation and Chaos
International Journal of Modern Physics C
Nonlinear Dynamics
Transformative Dialogues
Walailak Journal of Science and Technology

Societies & Memberships

Korean-American Scientists and Engineers Association (KSEA)
Mathematical Association of America (MAA), Project NExT Green '23
Nevada Chapter of the American Statistical Association (NV-ASA)
Society for Industrial and Applied Mathematics (SIAM)
(Formerly) American Mathematical Society (AMS)
(Formerly) Korean Meteorological Society (KMS)
(Formerly) American Geophysical Union (AGU)

Professional Development, Workshops

External Activities

Research Experiences for Undergraduate Faculty (REUF), American Institute of Mathematics (AIM) & Institute for Computational and Experimental Mathematics (ICERM), Pasadena, CA,

& Training

Jul 2026
CourseKata Study Group ("Starfish") for Instructors, CourseKata, Online, Fall 2025
CURM Summer Faculty Workshop, Center for Undergraduate Research in Mathematics, New Orleans, LA, USA, Jun 2025
MAA Project NExT (New Experiences in Teaching), 2023–2024
Understanding Machine Learning and Deep Learning, Korean Data and Information Science Society & Department of Statistics, Kyungpook National University, Daegu, South Korea, Jan 2020
Introduction to Parallel Programming Workshop, National Center for Meteorological Supercomputer, Cheongju, South Korea, Oct 2018
WRF Tutorial, National Center for Atmospheric Research (NCAR), Boulder, CO, USA, Jan 2018
Park City Mathematics Institute (PCMI), Undergraduate Program, Institute for Advanced Study (IAS), Park City, UT, USA, Jul 2013

The Fields Institute Activities
MfPH Shared Graduate Course, Jan–Apr 2022
CIFAL York Agent Based Modelling for Public Health (ABMfPH) Speaker Series, Feb–May 2022
Agent-Based & Hybrid Modeling Bootcamp & Incubator for Health & Health Care, Saskatoon, SK, Canada (& Online), Aug 2022

NSU Center for Teaching & Learning Excellence (CTLE) Activities
Faculty Learning Community (FLC)—Active Learning, Spring 2023
Workshop—Threading Sustainability into Your Curriculum, Summer 2023
Faculty Learning Community (FLC)—Intro to SoTL, Fall 2023
Faculty Learning Community (FLC)—Reacting-to-the-Past, Spring 2024
Workshop—Active Learning Retreat, Summer 2024
Workshop—AI Bootcamp, Summer 2025

Other NSU Activities
AI Literacy Initiative—University Library, Spring 2026

Other Experiences

Professional
AP Reader for Calculus AB/BC, 2026
Seoul National University Ph.D. Dissertation Template Design (link), 2021
Republic of Korea Army Basic Training, Nonsan, South Korea, Jul–Aug 2019
Friday Weather Forecasting Club, Seoul National University, 2016–2019

Community & Student Activities
Community Volunteer, Angel House, Goyang, South Korea, 2016–2019
- Project Pumpkin, Wake Forest University, Winston-Salem, NC
- Club Secretary, 2010–2013
- Anthro House, 2010–2011

Volunteer, Wake Saturdays, Winston-Salem, NC, 2010–2013
Prepared meals for individuals experiencing homelessness in W-S

Technical Skills

Proficient in MATLAB, Python, Fortran, and LaTeX
Familiarity with R, C++, and NCAR Command Language (NCL)
Experience with high-performance computing (HPC) clusters and Linux environments
Extensive experience with the Weather Research and Forecasting (WRF) model
Experience implementing the ensemble Kalman filter (EnKF)
AnyLogic and OpenM++ for agent-based modeling (ABM)
Experience developing agent-based models from scratch

Languages

English and Korean (bilingual)
Latin (working knowledge)