Tahira Pirzada, PhD
Department of Chemical & Biomolecular Engineering,
North Carolina State University, Raleigh, NC. 27695-7905.

EDUCATION

Technology Entrepreneurship & Commercialization Certificate by NCSU Jenkins MBA, Raleigh, NC. 2023 –
Teaching & Communication Certificate, North Carolina State University, Raleigh, NC. 2018-2020
Ph.D., Chemistry, Quaid-i-Azam University, Islamabad, Pakistan. 2007-2012

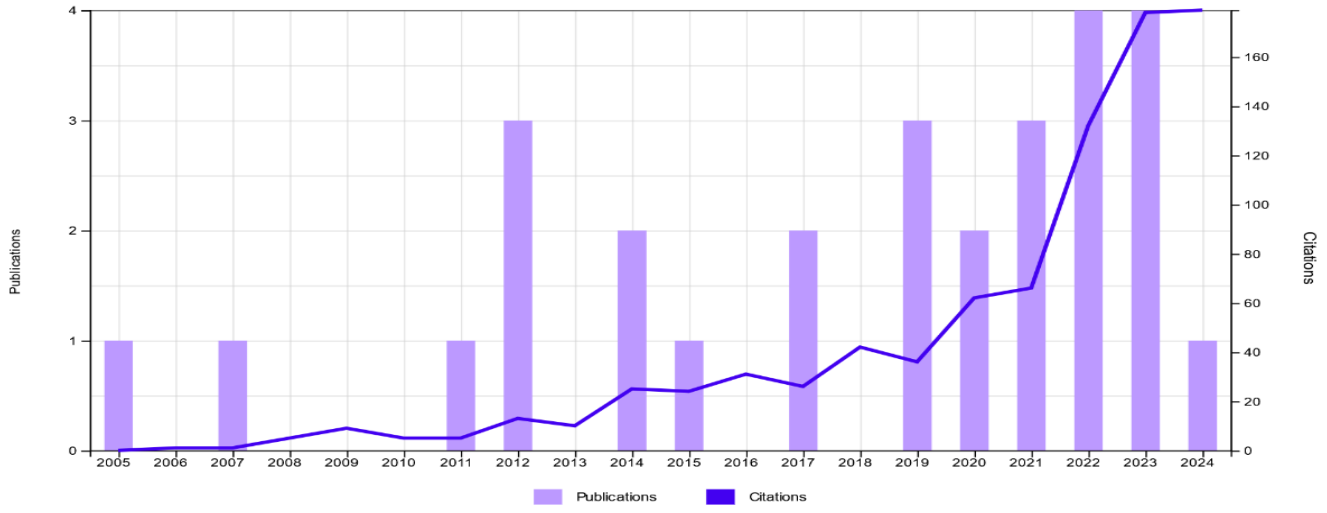
PROFESSIONAL EXPERIENCE

North Carolina State University, Raleigh, NC USA.
Research Scholar, Chemical & Biomolecular Engineering 2023 –
Research Associate, Chemical & Biomolecular Engineering 2020-2023
Postdoctoral Researcher, Chemical & Biomolecular Engineering 2016-2020
Soteria Formulations, Raleigh, NC- President & CEO 2023 –
Federal Directorate of Education, Islamabad, Pakistan
Assistant Professor & Head of Chemistry Department 2011-2016
Lecturer Chemistry, Member purchase committee, Controller Examination 2001-2011
Allama Iqbal Open University, Islamabad, Pakistan
Visting faculty: *Teaching & evaluating Physical Chemistry course-2527 to MSc* Chemistry 2013
Intel National Science Olympiad 2004-2012
Mentor: Supervised students on research projects (on green chemistry, alternate energy resources, and environmental chemistry) to compete at the provincial and national level for Intel International Science and Engineering Fairs
Quaid-i-Azam University, Islamabad, Pakistan 2007-2009
PhD Research Associate*: Grant proposals; Teacher assistant for CH-461 (Advanced Physical Chemistry lab for MPhil students)*
North Carolina State University, Raleigh, NC- Visiting d*octoral research fellow* 2010-2010

RESEARCH ACCOMPLISHMENTS

Peer-reviewed publications			33 +1 book chapter
Contributed Presentations			40 + 2 invited & 1 TED
Journals & Book covers			06
Patents			02
Reviewed articles			46
h-index	Web of Science: 12	Google Scholar: 13	As of February 4, 2025
No. of citations	Web of science: 896	Google Scholar: 1201	As of February 4, 2026

WEB OF SCIENCE CITATION REPORT (As of December 8, 2024)



LEADERSHIP & PROJECT MANAGEMENT EXPERIENCE

- Managing a North Carolina Biotechnology Centre (NCBC) Translational Research Grant funded project to develop biodegradable seed coatings as a co-PI. 2024–
- Leading and managing my ag-tech startup Soteria Formulations as President and CEO. 2023–
- Leading a DOE-funded STTR-II project in collaboration with a start-up to 'design biodegradable formulations to encapsulate plant growth promoting microbes for targeted and sustained release'. 2023–
- Led a project on 'Nature-inspired lignocellulosic materials for sustainable crop protection and environmental remediation' under-grads, grad and masters students. 2018-2024
- Led a project to 'develop stable formulations for various moisture and UV-sensitive agrochemicals' for an agrochemical company. 2023
- Led a DOE-funded STTR-I project in collaboration with a start-up to 'design biodegradable formulations to encapsulate plant growth promoting microbes for targeted and sustained release'. 2022
- Led a crop protection project on 'development of biodegradable matrices as seed wraps for crop protection in sub-Saharan Africa from managing the resources from Costa Rica, NCSU arboretum and Sri Lanka, fabrication of matrices in NCSU to application in the greenhouse and field trials in sub-Saharan Africa. 2016-2023
- Led a project on 'Development of crop protection sprayables' in collaboration with teammates in chemical engineering and Entomology & Plant Pathology departments and industry sponsors. 2020-2021
- Managing various projects focused on sustainable crop protection and materials fabrication with the help of graduate, masters and undergraduates at NCSU Chemical & Biomolecular Engineering department. 2016–
- Collaborating with postdoctoral researchers, graduate students, undergraduates and laboratory technicians in NCSU College of Natural Resources for fabrication of lignocellulose materials for crop protection in Africa. 2016-2022
- Working with graduate students and laboratory technicians in Entomology & Plant Pathology to set up bioassays and greenhouse trials to test different biodegradable matrices for crop protection. 2016-2022
- Managing resources, data and updates between Chemical & Biomolecular Engineering, Entomology & Plant Pathology and Forest Biomaterials departments at NCSU for various crop protection-related projects. 2016-2023
- Coordinating with collaborators in Costa Rica to manage raw materials to develop biodegradable seed wraps for field trials in sub-Saharan Africa. 2016-2022
- Coordinating with collaborators in the University of Abomey-Calavi, Benin and International Institute of Tropical Agriculture, Nairobi (Kenya) to manage resources and field trials. 2016-2022
- Facilitating meetings with the principal investigators, international collaborators and project team to ensure timely decision-making and effective communication between project stakeholders at all levels. 2016–
- Mentor students to develop aerogels from polymer-ceramic hybrid and polymer hybrid fibers. 2017–
- Led and managed personnel, resources, accounts and programs as head of the Chemistry department at the Federal Directorate of Education, Islamabad, Pakistan. 2005-2016

KEY PUBLICATIONS. (* indicates co-first authors, # indicates co-corresponding author)

- Contributed book chapter: **Tahira Pirzada,** Vahid Rahmanian, Saad A. Khan, "Nanofiber Aerogels: Bringing Third Dimension to the Electrospun Nanofibers" in '*Polymer Nanofibers: Science, Technology and Applications'* by John Wiley & Sons. April **2022**.
- Mariam Sohail,* John Cheadle,* Rishum Khan, Hrishikesh Mane, Khandoker Samaher Salem, Katie Ernst, Adriana San Miguel, Charles H. Opperman , **Tahira Pirzada**,# Nathan Crook,# Saad A. Khan# 'Pickering Emulsion for Enhanced Viability of Plant Growth Promoting Bacteria and Combined Delivery of Agrochemicals and Biologics' Advanced Functional Materials, **February 5, 2025**. [DOI]
- Dorris W. Kamau, Wanjohi Waceke, Laura Cortada-Gonzalez, Onesmus Mwaura, **Tahira Pirzada**, Tim Sit, Eric Davis, Dick Guenther, Reny Mathew, Lokendra Pal, Saad Khan, Solveig Haukeland, James Kisaakye , Charles Opperman, Danny Coyne 'Efficacy of banana fiber paper for the management of root-knot nematodes (Meloidogyne incognita) on potato (Solanum tuberosum) in Kenya' published online *Nematology*, 22 Nov **2024**. [DOI]
- Muhammed Ziauddin Ahmad Ebrahim, Vahid Rahmanian, Mai Abdelmigeed, **Tahira Pirzada#** and Saad A. Khan# Designing a MOF-functionalized Nanofibrous Aerogel via Vapor-Phase Synthesis" *Small Methods*, **2024**, 2400596**.** [DOI]
- Vahid Rahmanian, Muhammed Ziauddin Ahmad Ebrahim, Seyedamin Razavi , Mai Abdelmigeed Eduardo Barbieri , Stefano Menegatti, Gregory N. Parsons, Fanxing Li, **Tahira Pirzada**# and Saad A. Khan#. "*Vapor phase synthesis of metal–organic frameworks on a nanofibrous aerogel creates enhanced functionality*" *J. Mater. Chem. A*, **2024**, 12, 214-226. [DOI]
- Mariam Sohail, **Tahira Pirzada**, Richard H. Guenther, Eduardo Barbieri, Tim Sit, Stefano Manegatti, Nathan Crook, Charles H. Opperman and Saad A. Khan, "Cellulose acetate stabilized Pickering emulsions: synthesis, rheology and incorporation of agricultural active ingredients" *ACS Sustainable Chemistry & Engineering,* **2023**, 11(42), 15178-15191. [DOI]
- Vahid Rahmanian,* **Tahira Pirzada**,* Eduardo Barberi, Sherafgan Iftikhar, Fanxing Li and Saad A. Khan, "Mechanically robust, thermally insulating and photo-responsive aerogels designed from sol-gel electrospun PVP-TiO2 nanofibers" *Applied Materials Technologies,* **2023**, 32, 101784. [DOI]

- **Tahira Pirzada***, Antoine Affokpon*, Richard H. Guenther, Reny Mathew, Sachin Agate, Aitana Blevins, Medwick V. Byrd, Tim L. Sit, Stephen R. Koenning, Eric L. Davis, Lokendra Pal, Charles H. Opperman, Saad A. Khan, "Plant biomass-based hybrid seed wraps mitigate yield and post-harvest losses among smallholder farmers in sub-Saharan Africa" *Nature Food,* **2023**, 4, 148-159. [DOI] *Top 5% attention score of all research output of the same age in 2023.*
- Mariam Sohail, **Tahira Pirzada,** Richard H. Guenther, Eduardo Barbieri, Tim Sit, Stefano Manegatti, Nathan Crook, Charles H. Opperman and Saad A. Khan, "Cellulose acetate stabilized Pickering emulsions: synthesis, rheology and incorporation of agricultural active ingredients" ACS Sustainable Chemistry & Engineering, **2023**, 11(42), 15178-15191. [DOI]
- Mahshid Hosseini, Vahid Rahmanian, **Tahira Pirzada**, Nikolay Frick, Abhichart Krissanaprasit, Saad A. Khan, Thomas H. LaBean, "DNA aerogels and DNA-wrapped CNT aerogels for neuromorphic applications" *Materials Today Bio,* **2022**, 16, 100440. [DOI]
- Siyao Wang,* **Tahira Pirzada**,* Wenyi Xie, Eduardo Barbieri, Oindrila Hossain, Charles H. Opperman, Lokendra Pal, Qingshan Wei, Gregory N.Parsons, Saad A. Khan, "Creating hierarchically porous banana paper-metal organic framework (MOF) composites with multifunctionality" *Applied Materials Today,* **2022**, 101517. [DOI]
- Mariam Sohail,* **Tahira Pirzada**,* Charles H. Opperman and Saad A. Khan, "Recent advances in seed coating technologies: transitioning toward sustainable agriculture" (Inner back cover article), *Green Chemistry*, **2022**, 24, 6052. [DOI]
- **Tahira Pirzada**,* Mariam Sohail,* Anurodh Tripathi, Barbara V. de Farias, Reny Mathew, Chunying Li, Charles H. Opperman, Saad A. Khan, "Towards Sustainable Crop Protection: Aqueous Dispersions of Biodegradable Particles with Tunable Release and Rainfastness" (Back cover article) *Advanced Functional Materials,* **2022**, 32(18), 2270107. [DOI]
- Juliet Ochola, Laura Cortada , Onesmus Mwaura , Meklit Tariku , Shawn Christensen , Margaret Ng'ang'a , Ahmed Hassanali , **Tahira Pirzada** , Saad Khan , Lokendra Pal , Reny Mathew , Richard Guenther , Eric Davis , Tim Sit , Danny Coyne , Baldwyn Torto, "'Wrap and Plant' technology to manage sustainably potato cyst nematodes in East Africa" Nature Sustainability*,* **2022**, 5, 425-433**.** (DOI)
- Vahid Rehmanian, **Tahira Pirzada**, Siyao Wang, Saad A. Khan, "*Cellulose-Based Hybrid Aerogels: Strategies toward Design and Functionality*" (Cover article) *Advanced Materials,* **2021**, 2102892. [DOI]
- Marius Rutkevicius*, **Tahira Pirzada***, Mackenzie Geiger, Saad A. Khan, "Creating Superhydrophobic, Abrasion-Resistant & Breathable Coatings from Water-Borne PDMS-PU Co-Polymer and Fumed Silica" *Journal of Colloid & Interface Science,* **2021**, 596, 479-492. [DOI]
- **Tahira Pirzada**, Barbara V. de Farias, Reny Mathew, Richard H. Guenther, Medwick V. Byrd, Tim L. Sit, Lokendra Pal, Charles H. Opperman, and Saad A. Khan, "Recent Advances in Biodegradable Matrices for Effective Crop Protection: Towards Attaining Sustainability in Agriculture" *Current Opinions in Colloids & Interface Science,* **2020**, 48, 121-136. [DOI]
- **Tahira Pirzada**, Reny Mathew, Richard H Guenther, Tim L Sit, Charles H Opperman, Lokendra Pal, Saad A Khan, "Tailored Lignocellulose based Biodegradable Matrices with Effective Cargo Delivery for Crop Protection" (Cover article) *ACS Sustainable Chemistry & Engineering*, **2020,** 8(16),6590-6700. [DOI]
- **Tahira Pirzada**, Zahra Ashrafi, Wenyi Xie, Saad A. Khan, "Cellulose Silica Hybrid Nanofiber Aerogels - From sol-gel Electrospun Nanofibers to Multifunctional Aerogels" (Frontispiece) *Advanced Functional Materials,* **2020**, 30(5), 1907359. [DOI]
- Barbara Farias, **Tahira Pirzada***, Reny Mathew, Tim Sit, Charles Opperman, Saad A Khan, "Electrospun Polymer Nanofibers as Seed Coating for Crop Protection" *ACS Sustainable Chemistry & Engineering,* **2019**, 7(24), 19848-19856. [DOI]
- **Tahira Pirzada***, Barbara V. de Farias*, Hsiao Mei Annie Chu*, and Saad A. Khan, "Fabrication of Guar-Only Electrospun Nanofibers by Exploiting a High- and Low-Molecular-Weight Blend" *ACS Omega,* **2019**, *4* (6), 10767-10774. [DOI]
- **Tahira Pirzada***, Sara A. Arvidson*, Carl D. Saquing, S. Sakhawat Shah, and Saad A. Khan*, "Hybrid Carbon Silica Nanofibers through Sol–Gel Electrospinning" Langmuir,* **2014**, 30(51):15504-13. [DOI]
- **Tahira Pirzada***, Sara A. Arvidson*, Carl D. Saquing, S. Sakhawat Shah, and Saad A. Khan*, "*Hybrid Silica−PVA Nanofibers via Sol−Gel Electrospinning**"** Langmuir,* **2012**, 28(13), 5834-5844. [DOI] Top 10.00% most-cited articles published in Materials Science in 2012
- M. Saleem, **Tahira Pirzada**, Riaz Qadeer, "Sorption of some Azo dyes on wool fibers from aqueous solutions" *Colloids and Surfaces A: Physicochem. Eng. Aspects* 2005, 260, 183-188. [DOI]

AWARDS & HONORS

NSF National I-Corps conference/travel grant and stipend	2023
NSF Regional I-Corps travel grant for oral presentations at ACS Fall meeting in Chicago, IL.	2022
Materials Research Society 'Reward for the best 24-7 videos for NM04': MRS Fall, Boston, MI.	2018
NCSU graduate school Travel grant to present at the European Society of Nematologists Congress, in Ghent, Belgium.	2018
2nd place in Poster competition by ACS on Campus at Research Triangle Park, Durham, NC.	2016
Higher Education Commission (HEC), Pakistan	
International Research Support Initiative: 6-months fully funded fellowship to conduct Ph.D. research at North Carolina State University, Raleigh, NC.	2010

Indigenous Fellowship for fully funded Ph.D. studies 2007-2011
University Grants Commission (UGC), Pakistan
UGC-INFAQ Scholarship for M.Phil. Physical Chemistry. 1995-1997
UGC Scholarship for M.Sc. Chemistry. 1993-1994
UGC Scholarship for B.Sc. 1990-1992

KEY CONTRIBUTED PRESENTATIONS

- ACS Fall, San Francisco, CA, August 2023. (2 talks)
- Atlantic Basin Conference on Chemistry (ABCChem), Marrakech, Morocco, December 2022. (3 talks)
- ACS Fall, Chicago, IL, August 2022. (2 talks)
- MRS Spring, Honolulu, HI, May 2022. (1 talk)
- ACS Spring 2022 (hybrid), March 2022. (2 talks)
- Pacifichem 2021 International Chemical Congress of Pacific Basin Societies (virtual), December 2021 (1 talk)
- 2021 Materials Research Society Fall Meeting & Exhibit, Boston, MI, USA. November 2021. (1 talk)
- 25th Annual Green Chemistry & Engineering Conference (virtual). June 2021. (1 talk)
- Materials Research Society Spring Meeting (virtual), April 2021. (1 talk)
- ACS Spring Meeting (virtual), April 14 2021. (1 talk)
- ACS Fall Meeting (virtual), San Francisco, CA, August 17-20, 2020. (1 talk)
- APS March Meeting, Denver, CO. March 2020. (1 talk)
- Materials Research Society Fall Meeting & Exhibit, Boston, MI, USA. Nov 2018. (2 talks, *1 Selected as one of the Best 24-7 Video)*
- European society of Nematologists Congress**,** Ghent, Belgium, September 2018. (2 talks, 1 poster)
- American Institute of Chemical Engineers Annual Meeting, Minneapolis, MN, USA. November 2017. (2 talks)
- 253rd ACS National Meeting & Exposition, San Francisco, CA, USA. April 2017. (2 talks)
- TED talk at NC Museum of Science, Raleigh, NC, September 2016. (1 oral)
- ACS on Campus Research Triangle Park (RTP), September 2016. (poster, 2nd Place)
- Bayer Research Symposium (poster), Research Triangle Park (RTP), NC, USA. August 2016. (1 poster)
- International Scientific Spring 2013, National Centre of Physics, Islamabad, Pakistan. March 2013. (1 talk)

MENTORING

- Graduate students: 08 (US) + 02 (Pakistan)
- Masters: 02 (US) + 60 (Pakistan)
- Under-graduate: 04 (US) + 20 (Pakistan)
- K-12: 06 (US) + 100 (Pakistan)
- Research assistant: 02 (US) + 06 (Pakistan)

PROFESSIONAL SERVICES

Conference Organization/Services

- Session chair (upcoming): APS Spring Meeting; Nature-inspired Soft Matter for a Sustainable Tomorrow 2025
- Reviewer: Pitch presentation Nematology students Business Proposals at Ghent University, Belgium. 2023
- Session chair: APS Spring Meeting; G13: Aerogels, Foams and Sponges: Recent Advances and Challenges. 2023
- Session chair: ACS Fall Meeting, 2022; AGFD: Modification of Agricultural Biomass into Value-Added Products. 2022
- Mock interview/Resume reviewer/Speed mentor: MRS Spring Meeting. 2022
- Reviewer: ACS Local Section Meeting 2021
- Reviewer: NC Science and Engineering Virtual Fair. 2021
- Volunteer: Society of Rheology Conference, Raleigh, NC. 2019
- Panelist: NCSU Immersion week Accelerate to Industry (A2i) Alumni panel 2019

PATENTS & INVENTION DISCLOSURES

- 'Pickering emulsion for enhanced viability of plant growth promoting bacteria and combined delivery of agrochemicals and biologics' Mariam Sohail, Eduardo Barbieri, Nathan Crook, Richard H. Guenther, Saad A. Khan, Stefano Menegatti, Charles H Opperman, Tahira Pirzada, Tim L. Sit. Provisional patent filed, January 15, 2025.
- 'Wrap and Plant: a platform for solid-phase formulation of agrochemicals' invented by Richard H. Guenther, Tahira Pirzada, Reny Mathew, Tim L. Sit, Lokendra Pal, Medwick Byrd, Saad A. Khan and Charles H. Opperman. WO2022082160A1 (04/21); US20230389543A1, December 7, 2023.
- 'Aqueous dispersions including polymer particles' invented by Anurodh Tripathi, Tahira Pirzada, Barbara Vasconcelos de Farias, Reny Mathew, Charles H. Opperman & Saad A. Khan. US20240298634A1 (09/24); EP4021182A4 (09/24); CN114269155B, September 7, 2024.

- 'Bilayered Fibrous Aerogels for Environmental Remediation' Muhammad Ziauddin Ahmed Ibrahim, Saad A. Khan, Darshana Masura, Tahira Pirzada. May 2024.

MEDIA COVERAGE

- 'Wrap-and-plant method effective in reducing post-harvest loss of yam crops' Azo Lifesciences, February 2023.
- 'Yams Benefit from Banana 'Paper' Cocoon' NCSU News, February 2023.
- 'Combating the unseen enemy of yam' A News & Views article by F.M. Khamis, Nature Food, February 2023.
- Potato Farmers Conquer a Devastating Worm... with Banana Paper' GoogGoodGood.co, May 2022.
- 'Biodegradable banana "paper" can protect potato seeds from potato cyst nematodes, sharply increasing potato size and yields, research finds' Futurity, March 2022.
- 'Banana 'Paper' Stymies Potato Pest' NCSU Front Page News. March 2022.
- 'Breaking Bread Program Seeks Hosts' NCSU News. August 2017.

PROFESSIONAL DEVELOPMENT TRAINING

Technology Entrepreneurship and Commercialization I, NCSU Jenkins MBA, Raleigh, NC. (16 weeks, 3 credits hrs)	2024
Venture Opportunity Analytics, NCSU Jenkins MBA, Raleigh, NC, USA. (16 weeks, 3 credit hours)	2023
NSF National I-Corps program: Entrepreneurial Lead. (Duration: 8 weeks)	2023
NSF-funded Innovation CORPS (I-CORPS) program at North Carolina State University. (Duration: 8 weeks)	2022
Lean Six Sigma/Minitab introductory course (Duration: 8 weeks)	2020
Teaching & Communication certificate by North Carolina State University (Duration: 100 credit hours)	2020
Professional e-portfolio by the graduate school, North Carolina State University. (Duration: 44 hours)	2020
The Age of Sustainable Development by Columbia University on Coursera. (Duration: 44 hours)	2019
Accessibility in the Classroom by North Carolina State University. (Duration: 12 hours)	2019
How to write a Statement for Teaching Philosophy by North Carolina State University. (Duration:3 hours)	2018
Accelerate to Industry by NCSU Graduate School by North Carolina State University. (Duration:44 hours)	2018
Trillium Sustainability workshop by Duke University. (Duration: 8 hours)	2018
Structuring Content: Lesson, Course & Curriculum Design by North Carolina State University. (Duration:44 hours)	2018
Communicating Your Research with a Diverse Audience by North Carolina State University. (Duration: 2 hours)	2017

NON-ACADEMIC COURSE

The Science of Well-Being by Yale University on Coursera (Duration: 44 hours) 2018

PROFESSIONAL AFFILIATIONS

Current: American Association for the Advancement of Science (AAAS)
Past: American Chemical Society (ACS), Materials Research Society (MRS), American Institute of Chemical Engineers (AIChE), European Society of Nematologists (ESN), Chemical Society of Pakistan (CSP)

COMMUNITY INVOLVEMENT/OUTREACH

- Reviewer AGRO Division Student Poster Competition at ACS Fall, San Francisco. 2023
- Reviewer Pitch presentation Nematology students Business Proposals at Ghent University, Belgium. 2023
- Mock interview/Resume reviewer/Speed mentor: MRS Spring Meeting. 2022
- Reviewer ACS Local Section Meeting. 2021
- Reviewer NC Science and Engineering Virtual Fair. 2021
- Volunteer organizer for Society of Rheology Conference. 2019
- Panelist in Immersion week Accelerate to Industry (A2i) Alumni panel. 2019
- Volunteer at NC Food Bank 2019
- Participated in NCSU International Students and Scholars Engaged in Reaching out and Volunteering 2017-2018
- Participated and presented Pakistani culture to NC schools as NCSU Culture Corps in the Breaking Bread program where international students/researchers are hosted by an American family for cultural understanding. 2016-2017
- Volunteer for Service Raleigh. 2016
- Presented a TED talk at NC Museum of Natural Science. 2016