Mohammad Afzal Shadab

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Hydrology | Cryosphere | Modeling | Climate Change | Planetary Habitability

Positions Held

Future Faculty in the Physical Sciences Postdoctoral Fellow — 2024- Present
Departments of Civil and Environmental Engineering and Geosciences, *Princeton University* — Princeton

Graduate Research Assistant — 2019-24
Oden Institute for Computational Engineering and Sciences, *University of Texas at Austin* — Austin

NASA-JPL Graduate Fellow — Summer 2023
Planetary Science Division, *NASA Jet Propulsion Laboratory, California Institute of Technology* — Pasadena

NASA-JPL Graduate Fellow — Spring 2022
Earth Science Division, *NASA Jet Propulsion Laboratory, California Institute of Technology* — Pasadena

MIT Visiting Graduate Student Researcher — 2018-19
Department of Mechanical Engineering, *Massachusetts Institute of Technology* — Cambridge

Graduate Research Assistant — 2016-18
Dept. of Mechanical and Aerospace Engg., *Hong Kong University of Science and Technology* — Hong Kong

Education

Doctor of Philosophy | ***Computational Science, Engineering & Mathematics*** — 2024
The University of Texas at Austin, United States
Title: Modeling Subsurface Flow of Water in Earth and Planetary Sciences
Advisor: Dr. Marc Hesse, Professor of Earth and Planetary Sciences

Master of Science | ***Computational Science, Engineering & Mathematics*** — 2021
The University of Texas at Austin, United States — GPA: 3.90/4.0
Advisor: Dr. Marc Hesse, Professor of Earth and Planetary Sciences

Master of Philosophy | ***Mechanical Engineering*** — 2018
The Hong Kong University of Science and Technology — GPA: 4.0(A)/4.3(A+)
Thesis: Fifth-Order Finite Volume WENO in General Orthogonally-Curvilinear Coordinates
Advisor: Dr. Kun Xu, Chair Professor of Mathematics and Mechanical & Aerospace Engg.

Bachelor of Technology | ***Mechanical Engineering*** — 2016
Aligarh Muslim University, India — GPA: 9.62/10.0

Grants

Sustaining the Community Firn Model - *NASA ROSES'24 Support for Open-Source Tools, Frameworks, and Libraries*
Collaborator (implementing enthalpy formation in CFM and validating), $0 to PU, 1/2025-1/2028

Assessing Challenges for Polar Early Career Scientists During Science Policy Upheaval - *PSECCO Polar Partnership Networking Event Collaboration Funding Support*
Co-PI, $4000 to PU, 1/2025-1/2026

Carbon Dioxide Removal through Enhanced Rock Weathering Deployments with Smallholder Rice Paddy Farmers in India (Pending) - *Milkywire Climate Transformation Fund*
Collaborator (on coupled hydrologic & reactive transport modeling) - $0 to PU, 4/2025-7/2026

Oxidant Transport into Europa's Internal Ocean by Brine Migration Through the Outer Ice Shell - *Research Award in Planetary Habitability by UT Center for Planetary Systems Habitability*
PI - $16,425, 08/2022-12/2022

Research Experience

Modeling and Understanding Large-Scale Integrated Soil and Firn Hydrology — Princeton University
Postdoctoral Researcher; *Advisor*: Prof. Reed Maxwell, *Collaborator*: Prof. Howard Stone — 2024- Present

Reactive Transport Modeling of Enhanced Weathering in Soils for CO_2 Removal — Princeton University
Collaborative Researcher; *Collaborator*: Dr. Jacob Jordan (Mati, XPRIZE'25 Carbon) — Summer 2024- Present

Modeling Subsurface Flow of Water in Earth and Planetary Sciences — UT Austin
Graduate Research Assistant, *Doctoral Thesis*; *Advisor*: Prof. Marc Hesse — 2019-24

Vadose Zone and Groundwater Hydrology on Early Mars — UT Austin
Collaborative Researcher; *Collaborators*: Dr. Eric Hiatt, Dr. Rickbir Bahia (ESA) — 2020- Present

Improving the Numerical Toolset for Geodynamics of Icy Oceans World — Jet Propulsion Lab
NASA Jet Propulsion Lab Graduate Fellow; *Advisor*: Dr. Steven Vance — Summer 2023

Modeling Meltwater Percolation in Greenland's Firn — Jet Propulsion Lab
NASA Jet Propulsion Lab Graduate Fellow; *Advisor*: Dr. Surendra Adhikari — Spring 2022

Investigating Groundwater Flows using Physics Informed Neural Networks — UT Austin
Collaborative Researcher; *Collaborators*: Dr. Eric Hiatt, Dr. DingCheng Luo, Yiran Shen, Prof. Hesse — 2020-23

Free Fall of a Viscous Drop in a Viscoelastic Medium — Massachusetts Institute of Technology
Visiting Graduate Student Researcher; *Advisor*: Prof. Irmgard Bischofberger — 2018-19

High-Order Finite-Volume Methods in Curvilinear Coordinates — HKUST, Hong Kong
Graduate Research Assistant, *M.Phil. Thesis*; *Advisor*: Prof. Kun Xu — 2016-18

Teaching Experience (TA: Teaching Assistant, I: Instructor, All Feedback:)

Wintersession 2025 Analyzing Remote Sensing Data with QGIS (Princeton U., I)	Winter 2025
GEO 325C/398C Continuum Mechanics (UT-Austin, TA)	Fall 2022, 2023
GEO 325M/398M Numerical Modeling in the Geosciences (UT-Austin, TA)	Spring 2023
SIAM Applied Mathematics Mentorship Program Lectures (UT-Austin, I)	Fall 2022
MECH 1907 Introduction to Aerospace Engineering (HKUST, TA)	Spring 2018
MECH 3690 Aerospace Engineering Laboratory (HKUST, TA)	Spring 2017

Pedagogical Training

Teaching Transcript Program, Princeton University	Fall 2024 – Present
Inclusive Course Design Institute 2023, The University of Texas at Austin	Summer 2023
Inclusive Classrooms Leadership Certificate Seminar Series, University of Texas, Austin	Spring 2023
Advanced Teaching Preparation Series Certificate, University of Texas, Austin	Spring, Fall 2022
Graduate Teaching Assistant Training Program, H. K. University of Science and Technology	2017-18

Accolades

Princeton University Future Faculty in the Physical Sciences Fellowship	2024-27
Polar Science Early Career Community Office Polar Partnership Networking Award	2025-26
AGU Cryosphere Innovation Award / Flash Freeze Competition Winner	2023
UT Austin Graduate School Fellowships	2021-22, Summer 2024, Spring 2024
NASA Jet Propulsion Laboratory Graduate Fellowship	Summer 2023, Summer 2022
European Space Agency Early Career Bursary Award	2023
Purdue Climate Scholar by Purdue University and Office of Naval Research	Summer 2022
MIT - Houston Energy Innovation Student Fellow	2022-23
Lunar and Planetary Institute Career Development Award	2022
Outstanding Student Presenters Award by Unsaturated Zone Technical Committee, AGU	2021
Best Teaching Assistant Award by Dept of Mech & Aero Engg, HKUST	2018
Outstanding Contribution in Reviewing Recognition by Journal of Computational Physics	2018, 2023
Postgraduate Research Scholarship (Studentship) by HKUST	2016-18

Invited Talks and Seminars

[11] December 2025: AGU Fall Meeting, Session: *From Snowflakes to Runoff: Firn and Surface Mass Balance Processes*

[10] September 2025: The University of New Mexico, *Department of Earth and Planetary Sciences Seminar*

[9] April 2025: NASA Jet Propulsion Laboratory, *Earth Science Division Seminar*

[8] April 2025: Princeton University, *Solid Earth Geosciences Brown Bag Seminar*

[7] April 2024: Mathematics on Ice Forum

[6] Jan 2024: California Institute of Technology - *Graduate Aerospace Laboratories (GALCIT) and Fu Research Group*

[5] Oct 2023: The University of Texas at Austin - *Center for Planetary Systems Habitability*

[4] Sept 2023: The University of Texas Institute for Geophysics

[3] August 2023: NASA Jet Propulsion Laboratory, *Planetary Science Division Seminar*

[2] June 2022: NASA Jet Propulsion Laboratory, *Earth Science Division Seminar*

[1] June 2022: California Institute of Technology, *Fu Research Group*

Skills

Languages: C, C++, Fortran 77/90, Python (SciPy, NumPy, Matplotlib, Pandas, Pytorch, Tkinter, Tensorflow, GUI programming, Webscraping), HTML, Matlab, Mathematica, Shell Scripting, LaTeX, High Performance Computing (SLURM), FEniCS
General Software: AutoCAD, SolidWorks, ANSYS, Fluent, COMSOL Multiphysics, TecPlot, ParaView, Microsoft Office, Git, Travis CI, Docker
Geoscience Software: Hydrus, Noah-MP, VPLanet, QGIS, QGreenland, ENVI, PlanetProfile, PHREEQC, ParFlow, Community Land Model, Community Firn Model
OS: Linux, Windows, Mac

Peer Reviewed Publications

[13] **Shadab, M.A.**, Rutishauser, A., Grima, C. and Hesse, M.A, 2025. A unified kinematic wave theory for melt infiltration into firn. *Journal of Glaciology*, 71, e87, 1–25.
https://doi.org/10.1017/jog.2025.10055

[12] **Shadab, M.A.**, Hiatt, E., Bahia, R.S., Bohacek, E.V., Steinmann, V. and Hesse, M.A., 2025. Infiltration dynamics on early Mars: Geomorphic, climactic, and water storage implications, *Geophysical Research Letters*, 52, e2024GL111939, 11+12pp.
https://doi.org/10.1029/2024GL111939

[11] Barnes, R., ... **Shadab, M.A.**,..., 2025. History and habitability of the LP 890-9 planetary system, *The Planetary Science Journal*, 6(1), p.25, 13pp.
https://www.doi.org/10.3847/PSJ/ad94dc

[10] Vanek, S., ..., **Shadab, M.A.**,..., 2024. Exploring the past, present, and future of USAPECS: Lessons from a decade of supporting early career research across national and international polar networks. *Arctic Yearbook*, 14pp.
https://arcticyearbook.com/

[9] **Shadab, M.A.**, Adhikari, S., Rutishauser, A., Grima, C. and Hesse, M.A., 2024. A mechanism for ice layer formation in glacial firn. *Geophysical Research Letters*, 51(15), p.e2024GL109893, 12+37pp.
https://doi.org/10.1029/2024GL109893

[8] **Shadab, M.A.** and Hesse, M.A., 2024. A hyperbolic-elliptic PDE model and conservative numerical method for gravity-dominated variably-saturated groundwater flow. *Advances in Water Resources*, p.104736, 17pp.
https://doi.org/10.1016/j.advwatres.2024.104736

[7] Hiatt, E. **Shadab, M.A.**, Hesse, M., Goudge, T., Gulick, S., 2024. Limited recharge of the southern highlands aquifer on early Mars, *Icarus*, 408, p.115774, 10+16pp.
https://doi.org/10.1016/j.icarus.2023.115774

[6] **Shadab, M.A.**, Hiatt, E. and Hesse, M.A., 2023. PKgui: A GUI software for Polubarinova-Kochina's solutions of steady unconfined groundwater flow, *SoftwareX*, 24, p.101573, 5+5pp.
https://doi.org/10.1016/j.softx.2023.101573

[5] **Shadab, M.A.**, Luo, D., Hiatt, E., Hiatt, E. and Hesse, M.A., 2023. Investigating steady unconfined groundwater flow using physics informed neural networks, *Advances in Water Resources*, 177, p.104445, 16+18pp.
https://doi.org/10.1016/j.advwatres.2023.104445

[4] **Shadab, M.A.** and Hesse, M.A., 2022. Analysis of gravity-driven infiltration with the development of a saturated region, *Water Resources Research*, 58(11), p.e2022WR032963, 27pp.
https://doi.org/10.1029/2022WR032963

[3] **Shadab, M.A.**, Balsara, D., Shyy, W. and Xu, K., 2019. Fifth-order finite volume WENO in general orthogonally - curvilinear coordinates. *Computers & Fluids*, 190, 26pp.
https://doi.org/10.1016/j.compfluid.2019.06.031

[2] **Shadab, M.A.**, Ji, X. and Xu, K., 2018. Fifth-order finite volume WENO on cylindrical grids. *Spectral and High Order Methods for Partial Differential Equations (Springer)*, 10pp.
https://doi.org/10.1007/978-3-030-39647-3_51

[1] **Shadab, M.A.** and Baig, M.F., 2017. Investigation and control of unstart phenomenon in scramjets. *In 21st AIAA International Space Planes and Hypersonics Technologies Conference* (p. 2298), 16pp.
https://doi.org/10.2514/6.2017-2298

Under Review

[3] **Shadab, M.A.**, Stone, H.A., and Maxwell, R.M., 202X. A vertically integrated model for aquifers in cold firn, arXiv:2510.14268. (Under review in *Advances in Water Resources*)

[2] **Shadab, M.A.**, Vance, S.D., Silber, E A., Crósta, A.P., Carnahan, E., Jordan, J.S., Hesse, M.A., 202X. Rapid migration of impact melt through ocean world ices: Selk crater on Titan and Mannann'an crater on Europa. (Under review in *Earth and Planetary Science Letters*)

[1] Jordan, J.S., **Shadab, M.A.**, Prigiobbe, V., Planavsky, N., 202X. On the pH-dependent export of anthropogenic alkalinity in porewater through soil: Implications for enhanced rock weathering. (Under review in *SIAM Journal on Applied Mathematics*)

In Preparation

[8] **Shadab, M.A.**, Jadallah, N.S., and Maxwell, R.M., 202X. Effects of soil capillarity on multidimensional, integrated surface-subsurface hydrology at different spatial scales. (for *Water Resources Research*)

[7] **Shadab, M.A.**, Adhikari, S., Stevens, C.M., Rennermalm, A., Xiao, J., Hesse, M.A., Maxwell, R.M., 202X. Towards understanding large-scale, multidimensional meltwater infiltration and ice layer formation in Greenland firn. (for *Journal of Glaciology*)

[6] **Kiara P.** et. al (including **Shadab, M.A.**), 202X. Connections and Considerations for Application of Earth to Planetary Bodies: Mars as a Case Study. (for *Journal of Geophysical Research - Planets*)

[5] **Shadab, M.A.**, Hiatt, E. and Hesse, M.A., 202X. Analytical solutions of a low-aspect-ratio unconfined aquifer on a spherical shell: Application to early Mars. (for *Journal of Geophysical Research - Planets*)

[4] **Shadab, M.A.** and Hesse, M.A., 202X. An open source discrete operator toolbox (DOT) to solve geophysical flow problems. (for *Geoscientific Model Development*)

[3] Hiatt, E. **Shadab, M.A.**, Hesse, M., Goudge, T., Gulick, S., 202X. Transient groundwater models suggest short lived recharge events on early Mars. (for *Nature Geoscience*)

[2] Hiatt, E. **Shadab, M.A.**, Hesse, M.A., 202X. Experimental and numerical investigations of seepage face dynamics: A physics solution. (for *Journal of Fluid Mechanics*)

[1] Hesse, M.A. and **Shadab, M.A.**, 202X. Numerical modeling for geoscientists. (book draft)

Extended Conference Abstracts

[11] Hiatt, E., **Shadab, M.A.** et al., 2025. Transient Groundwater Recharge of Early Mars' Groundwater Systems & Subsequent Climate Constraints *56th Lunar and Planetary Science Conference*, #2629, 2pp.

[10] **Shadab, M.A.** et al., 2024. Evolution of impact generated melt at Selk crater: Effect of phase change, percolation, and viscous foundering. *55th Lunar and Planetary Science Conference*, #1317, 2pp.

[9] **Shadab, M.A.** et al., 2024. Infiltration on early Mars & its implications toward aeolian-fluvial interactions. *55th Lunar and Planetary Science Conference*, #1383, 2pp.

[8] Hiatt, E., **Shadab, M.A.**, Gulick, S.P.S., Goudge, T. and Hesse, M.A., 2024. Martian lakes: a critical requirement for transient groundwater models. *55th Lunar and Planetary Science Conference*, #2408, 2pp.

[7] **Shadab, M.A.**, Hiatt, E. and Hesse, M.A., 2023. A deep crustal aquifer model for southern highlands of Noachian Mars shows groundwater age and near-surface dynamics. *NASA Exploration Science Forum*, 2pp.

[6] **Shadab, M.A.**, Hiatt, E. and Hesse, M.A., 2023. A deep crustal aquifer model for southern highlands of Noachian Mars shows groundwater age and near-surface dynamics. *Brines Across the Solar System: Ancient and Future Brines Conference*, #2025, 2pp.

[5] **Shadab, M.A.**, Hiatt, E. and Hesse, M.A., 2023. Investigating groundwater dynamics and residence times on early Mars using unconfined aquifer model with vertical heterogeneity. *54th Lunar and Planetary Science Conference*, #1736, 2pp.

[4] Hesse, M.A., **Shadab, M.A.** and Hiatt, E., 2023. Time scales for terminal groundwater drainage from the southern highlands on Mars. *54th Lunar and Planetary Science Conference*, #1637, 2pp.

[3] Hiatt, E., **Shadab, M.A.** and Hesse, M.A., 2023. Planetary scale groundwater and surface water interaction on early Mars. *54th Lunar and Planetary Science Conference*, #2415, 2pp.

[2] **Shadab, M.A.**, Hiatt, E., and Hesse, M.A., 2022. Estimates of Martian mean recharge rates from analytic groundwater models. *53rd Lunar and Planetary Science Conference*, #1775, 2pp.

[1] Hiatt, E., **Shadab, M.A.**, Gulick, S.P.S., Hesse, M.A., Goudge, T. and Hesse 2022. Estimates of groundwater divides and basins on Noachian Mars. *53rd Lunar and Planetary Science Conference*, #2618, 2pp.

Selected Conference Presentations

[10] **Shadab, M.A.** et al., 2025. A theoretical & numerical model for unconfined aquifers in cold firn, *AGU Fall Meeting*.

[9] **Shadab, M.A.** et al., 2025. Modeling meltwater infiltration & ice layer formation in Greenland firn (invited), *AGU Fall Meeting*.

[8] **Shadab, M.A.** et al., 2025. Effects of soil capillarity on multidimensional, integrated surface-subsurface hydrology at different spatial scales, *AGU Fall Meeting*.

[7] **Shadab, M.A.** et al., 2025. Towards understanding large-scale multi-dimensional infiltration and ice layer formation in glacial firn, *Northeast Glaciology Meeting*.

[6] **Shadab, M.A.** et al., 2024. Evolution of impact generated melt at Selk crater, *AGU Fall Meeting*.

[5] **Shadab, M.A.** et al., 2024. Multi-scale multi dimensional infiltration in glacial firn and mechanism of ice layer and chunk formation, *AGU Fall Meeting*.

[4] **Shadab, M.A.** et al., 2024. Dynamics of Infiltration on Early Mars, *AGU Fall Meeting*.

[3] **Shadab, M.A.** et al., 2023. Mechanism & factors controlling ice layer formation in glacial firn, *AGU Fall Meeting*.

[2] **Shadab, M.A.** et al., 2023. A unified kinematic wave theory for melt infiltration into firn, *AGU Fall Meeting*.

[1] **Shadab, M.A.** et al., 2023. Infiltration on early Mars and its implications toward aeolian-fluvial interactions, *Fluvial-Aeolian Interactions on Planetary Surfaces (FAIRPLAY), European Space Agency*.

Open Source Software

[9] **Shadab, M.A.** et al., 2025. ColdFirnAquifer3D: A Numerical Simulator for Aquifers in Cold Firn (v1.0). Zenodo. https://doi.org/10.5281/zenodo.17354686

[8] **Shadab, M.A.** et al., 2025. Infiltration-on-early-Mars (v1.0.1). Zenodo. https://doi.org/10.5281/zenodo.14742437

[7] **Shadab, M.A.** et al., 2024. unified-kinematic-wave-theory (v1.0). Zenodo. https://doi.org/10.5281/zenodo.13936153

[6] **Shadab, M.A.** et al., 2024. mashadab/ice-layer-formation: v1.0.0, Zenodo. https://doi.org/10.5281/zenodo.12706191

[5] **Shadab, M.A.** and Hesse, M. A., 2024. mashadab/VarSatFlow: v1.0, Zenodo. https://doi.org/10.5281/zenodo.11398273

[4] **Shadab, M.A.** et al., 2023. mashadab/PKgui (v1.0.1), Zenodo. https://doi.org/10.5281/zenodo.8034146

[3] **Shadab, M.A.** and Hesse, M.A., 2022. Gravity driven infiltration with the development of a saturated region (v1.0), Zenodo. https://doi.org/10.5281/zenodo.6558260

[2] **Shadab, M.A.** et al., 2021. PINNs for unconfined groundwater flow (v1.0), Zenodo. https://doi.org/10.5281/zenodo.5803542

[1] **Shadab, M.A.**, 2021. Reservoir-Simulator, Zenodo. https://doi.org/10.5281/zenodo.6581752

Service

AGU25 Sessions' Early Career Convener, Four Sessions 2025
Convening *C039 - Cryosphere Is for All, P041 - The New Mars Underground VIII, C040 - The End of The Golden Era of Polar Science in the US?, U014 - Navigating Broader Impacts in Current Political Climate*

AGU24 Sessions' Convener and OSPA Liaison and Judge, Three Sessions 2024
Designing oral/poster/e-lightening sessions with AGU Cryo team titled *C24A/C41C/C43C The Cryosphere Is for All: Overcoming Barriers to Participation in the Cryospheric Sciences* at AGU24.

Executive Secretary and/or Reviewer, Seven NASA ROSES Review Panels 2023- Present
Managed panel reviews or reviewed proposals in panels, receiving honorariums

Executive Committee Member, AGU Cryosphere Division 2024- Present
Serving in the Diversity, Equity, and Inclusion (DEI) and Canvassing Working groups. Virtual

Judge, AGU Fall Meeting Travel Award Fall 2024
Reviewed cryosphere division related applications for AGU 2024 from around the world. Virtual

Judge, International Mission to Mars Engineering Design Contest Summer 2024
Organized by Mars Society for high school students from around the world. Virtual

Team Member, UT Austin Libraries HELIOS team 2023-24
To advance Higher Education Leadership Initiative for Open Scholarship (HELIOS).
Gave a speech at ***US White House*** Listening Sessions on Open Science (News, Post, Video).
Panelist at multiple open science events: Navigating the New Arctic, Texas Summit , IFLA. Austin

Co-Chair & DEI Team Lead, US Assoc. of Polar Early Career Scientists 2022- Present
Fostering climate and DEI-conscious collaborations between academia & polar organizations. Virtual

Board Member, AGU Hydrology Section Student Subcommittee (AGU-H3S) 2023- Present
Providing professional development & networking opportunities to early career hydrologists. Virtual

Volunteer, MIT Energy Conference 2023
Assisted in organizing in-person sessions at the conference. Boston

Coordinator, Center for Planetary Systems Habitability Student Travel Award Spring 2023
Organized, coordinated and liaised the application process for student travel to LPSC 2023. Austin

MIT - Houston Energy Innovation Student Fellow 2022-23
Cultivated & supported energy innovation startup ecosystem considering threat of climate change. Austin

Volunteer / Braindate Lounge Assistant, AGU Fall Meeting 2022 2022
Facilitated collaborations between researchers and scientists through Braindate at AGU 2022. San Francisco

Session Chair, Society for Industrial & Applied Mathematics Annual Meeting 2021
Chaired the *CP15: Machine Learning and Data Mining* Session. Virtual

President & Senior Advisor, SIAM Chapter of UT Austin 2020-23
Spearheaded several programs & won Best Graduate Organization at UT Austin Award. Austin

Volunteer, Lunar and Planetary Science Conference 2022 2021
Managed a virtual session and an in-person session and helped with conference logistics. Houston

Mentorship Experience

Princeton High School Student Research Mentor 2025- Present
Mentoring a high school student on developing a physics informed machine learning model for wet firn hydrology, including data analysis, scientific writing, and presentations. In-person

Interagency Arctic Research Policy Committee Mentorship program 2024- Present
Providing career counseling and skills training. Virtual

Young Professional Mentor, Zed Factor Fellowship Program 2023-24
Mentored rising undergraduate students in aerospace engineering for skills development. Virtual

American Geophys. Union Earth & Planetary Surface Processes (EPSP) Mentorship 2022- Present
Mentoring graduate students across the world to develop technical and research skills in EPSP. Virtual

Mentoring365, American Geophysical Union 2021- Present
Facilitating an exchange of professional knowledge, skills, and experiences in Earth and space sciences. Virtual

SIAM Applied Mathematics Mentorship 2021-23
Founded program and mentored undergrads for applied math concepts, research & careers. Austin

Sir Syed Global Scholar Award 2016- Present
Mentoring top AMU students from humble backgrounds for US grad school applications. Virtual

Outreach

Science Outreach Educator, Integrated Ground Water Modeling Center, Princeton Univ. 2024- Present
Instructed hydrologic modeling course to high schoolers; conducted outreach for K-12 students.

Geoscience Ambassador, Jackson School of Geosciences, UT Austin 2021-22
Making geoscience accessible to broader community & promoting interdisciplinary research. Austin

Zonal Head & College Head Ambassador, Smilyo Educational Charitable Society 2014-15
Managed multi-university teams & provided educational resources to not-so-privileged. New Delhi, India

Reviewer

Geoscience: Nature Astronomy, Water Resources Res., Geophysical Research Lett., Computational Geoscience, J. of Geophysical Research, Biosystems Engg., J. of Hydrometeorology, Discover Geoscience, J. of Applied Geophysics
Numerical Methods: J. of Computational Physics, Geoscientific Model Development, Computer and Fluids, Engineering with Computers, SoftwareX

Media Coverage

$50 million XPRIZE carbon removal awarded to Mati - Time, Washington Post, AP news 2025
On carbon removal work using enhanced rock weathering led by Mati Carbon (XPRIZE website).

Is Mars Storing its Water Underground? - Universe Today, SciTech Daily, Astrobiology 2025
Article on infiltration on Early Mars also covered by UT, AAAS, Phys.org, and Earth.com.
More coverage in Frankfurter Neue Presse, TZ, Ingenieur, and Stars, Cells, and God Podcast.

Understanding ice layer formation to estimate sea level rise - UT, AAAS, Phys.org 2024
For the thesis work on understanding ice layer formation done in collaboration with NASA-JPL.

History and Habitability of the LP 890-9 Planetary System - Astrobiology 2024
For the collaborative work on the habitability of exoplanetary system LP 890-9.

Little groundwater recharge in ancient Mars aquifer - UT, EurekAlert AAAS, Phys.org 2024
For the collaborative work with Eric Hiatt on water on early Mars.

Fulfilling my NASA dream - Sir Syed Global Scholar Award Story of the Month 2022
On my post-baccalaureate experience towards landing a graduate fellowship at NASA JPL.

Mars may have less water than previously estimated - Multiple news outlets 2022
UT Austin Website (front cover), & , Phys.org, Times of India, Bailey Universe

Outstanding Student Presentation Award at AGU 2021 - UT Austin 2022
For outstanding student presentation on Rainwater Infiltration in AGU Fall Meeting 2021.

CPSH Travel Grant sends 11 students to LPSC - UT Austin 2022
For travel grant from Center for Planetary Systems Habitability to attend LPSC 2022.

Lunar & Planetary Institute Career Devel. Award News - UT Austin, LPI News 2022
For outstanding first-authored work on fate of water on early Mars at LPSC conference.

How to stay productive while in quarantine - Oden Institute Feature Article 2021
For academic & research achievements and service at Oden Institute during quarantine.