

Natasha Sekhon
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ACADEMIC APPOINTMENTS

2024 – Present	Assistant Professor Department of Geology, Occidental College
2024 – Present	Research Affiliate Institute at Brown for Environment and Society, Brown University
2021 – 2023	Voss Postdoctoral Research Associate & Presidential Diversity Postdoctoral Fellow Department of Earth, Environmental, Planetary Sciences & Institute, Brown for Environment and Society, Brown University
2021 – 2023	Research Affiliate Department of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology

RESEARCH INTERESTS

☐ Terrestrial climate change ☐ Abrupt climate change ☐ Speleology ☐ Karst hydrogeology ☐ Low-temperature stable isotopes ☐ Trace element geochemistry ☐ Modern and Past Hydroclimate Variability ☐ Multivariate and big data statistical analysis ☐ Carbonate critical zone

EDUCATION

2016 – 2021	Ph.D. in Geological Sciences Department of Geological Sciences, University of Texas at Austin
2014 – 2016	M.S. in Geological Sciences Institute of Geophysics, University of Texas at Austin
2010 – 2014	B.S. in Earth System Sciences (Honors); Minor in Comparative Literature University of California, Irvine
2013	University of California Education Abroad Program (UCEAP) University of Edinburgh

AWARDS AND HONORS

2023	Geological Society of America Karst Division Early Career Award
2022	Brown's Postdoctoral Excellence Award for Research/Teaching, DEPARTMENT OF (\$500)

2021-2023	Voss Postdoctoral Research Associate & Presidential Diversity Postdoctoral Fellow (\$130,00)
2020-2021	Graduate Student Continuing Fellowship, University of Texas at Austin (\$30,000)
2017	Jackson School of Geosciences Independent Study Fellowship, University of Texas at Austin
2014	Outstanding Senior in Earth and Environmental Sciences, University of California, Irvine
2014	Honors in Earth and Environmental Sciences, University of California, Irvine
2014	Chancellor's Award for Excellence in Research, University of California, Irvine
2014	Phi Beta Kappa Honor Society
2012-2013	Maria Rebecca and Maureen Bellettini Award, UCEAP (\$5,000)

Dean's List: Winter 2012, Spring 2012, Spring 2013, Fall 2013, Winter 2014, Spring 2014

GRANTS AND FELLOWSHIPS

2022	Kart Records IX Travel Grant, Karst Records Meeting, Innsbruck, Austria \$884
2021-2022	National Cave and Karst Research Institute Seed Grant, Co-PI: Utilizing Stalagmites from the PhilippineS (USPS): Quantifying and understanding interannual hydroclimate variability in the Philippines through cave monitoring and stalagmite analyses. \$24, 991
2021-2023	Voss Postdoctoral Research Associate & Presidential Diversity Fellowship \$4,000
2020	Geological Society of America Graduate Student Research Grant \$1,375
2020	Geological Society of America Graduate Student Research Grant \$1,375
2019	National Cave and Karst Research Institute Fellowship for Research \$5,000
2019	Jackson School of Geoscience Match Grant \$1,000

2019	Patty Daw Memorial Grant \$752
2018	Cleveland Grotto Science Fund \$1,610
2018	DeFord Field Scholarship \$1,500
2018	Jackson School of Geoscience Match Grant \$1,000
2017	Graduate Research Grant for Cave and Karst Research \$2,000
2017	DeFord Field Scholarship \$1,500
2017	Jackson School of Geoscience Match Grant \$1,000
2017	Geological Society of America Graduate Student Research Grant \$1,750
2015	Muehlberger Field Scholarship Off-Campus Summer Research \$1,500
2015	ANSTO Grant, 2 nd Summer School in Speleothem Sciences \$1,500

PUBLICATIONS

*Denotes student mentee at time of publication. [†] Denotes big data publication.

Published

- 2023** Fohlmeister, J., **N. Sekhon**, A. Columbu, K. Rehfeld, L. Sime, C. Veiga-Pires, N. Marwan, & N. Boers, "Global reorganization of atmospheric circulation during Dansgaard-Oeschger cycles," *Proceedings of the National Academies of Sciences*. DOI: [10.1073/pnas.2302283120](https://doi.org/10.1073/pnas.2302283120)
- Sekhon, N.**, D.M. Tremaine, J. L. Banner, & D. O. Breecker, "Mapping atypical and typical stalagmite morphologies using high resolution X-Ray computed tomography as a non-destructive and rapid test for paleoclimate suitability," *Journal of Cave and Karst Studies*. DOI:10.4311/2021ES0122
- Covington, M. D., J. B. Martin, L. Toran, J. Macalady, **N.Sekhon**, P. L. Sullivan, A. A. Garcia, J.B. Heffernan, W. D. Graham, "Carbonates in the Critical Zone," *Earth's Future*, DOI: 10.1029/2022EF002765
- 2022** **Sekhon, N.**, C.P.C. David, M.C.M. Geronia, M.J.G. Custado & D.E. Ibarra, "Investigating the response of hydrological processes to El Niño events using a

100- year dataset from the western Pacific Ocean,” *Journal of Hydrology: Regional Studies* DOI: doi.org/10.1016/j.ejrh.2022.101174

David, C.P., M.J., Custado, **N. Sekhon** & D.E. Ibarra, “Forecasting tropical ENSO-induced drought conditions using sea surface heights in the Western Pacific,” *All Earth*. DOI: 10.1080/27669645.2022.2089484

2021 Gallagher, T., L. Serach, **N. Sekhon**, H. Zhang, H.Wang, S. Ji, C. Xi, H Lu, & D.O. Breecker, “Regional patterns in Miocene-Pliocene aridity across the Chinese Loess Plateau revealed by high resolution records of paleosol carbonate and occluded organic matter,” *Earth and Planetary Science Letters*. DOI: doi.org/10.1029/2021PA004344

Sekhon, N., V. F. Novello, F. A. Cruz, B.E. Wortham, T.G.R. Ribeiro, & D. O. Breecker, “Diurnal to seasonal cave ventilation in Brazilian Caves,” *Global and Planetary Change*. DOI: 10.1016/j.gloplacha.2020.103378

2020 **Sekhon, N.**, T. Beach, S. Krause, & S. Eshleman, “Understanding climate trends in Central America through practical problem-based learning,” *Journal of Geography in Higher Education*. DOI: 10.1080/03098265.2020.1833318

Griffiths, M.L., K.R. Johnson, F.S.R. Pausata, J.C. White, G.M. Henderson, C.T. Wood, H. Yang, V. Ersek, C. Conrad & **N. Sekhon**, “Mid-to-Late Holocene Megadroughts in the Middle Mekong Basin Linked to Global Climate Changes,” *Nature Communications*. DOI: 10.1038/s41467-020-17927-6

2019 Oster, J. L., S. F. Warken, **N. Sekhon**, M. M. Arienzo, & M. Lachniet, “Speleothem Paleoclimatology for the Caribbean, Central America, and North America,” *Quaternary*. DOI: 10.3390/quat2010005

[†]Comas-Bru, L., S.P. Harrison, M. Werner, K. Rehfeld, N. Scroxton, C. Veiga-Pires, & **SISAL Working Group Members**, “Evaluating model outputs using integrated global speleothem records of climate change since the last glacial,” *Climate of the Past*. DOI: 10.5194/cp-15-1557-2019

2018 [†]Atsawawanunt, K, S. Harrison, L., Comas-Bru, & **SISAL Working Group Members**, “The SISAL database: a global resource to document oxygen and carbon isotope records from speleothems,” *Earth System Science Data*. DOI: 10.5194/essd-10-1687- 2018

Under Review

1. [†] Kaushal, Nikita, et al. "SISALv3: A global speleothem stable isotope and trace element database." *Earth System Science Data Discussions* 2023 (2023): 1-33. DOI: 10.5194/essd-2023-364
2. *Marsh, C., **N. Sekhon**, T. Beach, D. McGee & D.E. Ibarra, "Late Holocene hydroclimate changes recorded in $\delta^{18}\text{O}$ of a stalagmite from Cueva De La Fabrica, Colombia," *Paleoclimatology and Paleoceanography*. (PDF Available on request)
3. **Sekhon, N.**, J. L. Banner, D. O. Breecker, B. A. Black, & N. R. Miller, "Moving towards an understanding of transition metal variability controls in stalagmites: An assessment in sub-annually resolved 20th-century stalagmites from semi-arid southwestern United States," *Geochimica et Cosmochimica Acta* (PDF Available on request)

INVITED TALKS

University of California, Irvine: <i>Spring Seminar Series</i>	February, 2023
Department of Earth System Sciences	
Occidental College: <i>Fall Seminar Series</i>	November, 2022
Department of Geology	
Washington and Lee University: <i>Fall Seminar Series</i>	November, 2022
Department of Earth and Environmental Geosciences	
James Madison University: <i>Fall Seminar Series</i>	November, 2022
Department of Geology, Geography, and Environmental Studies	
Brown University: <i>Co-Shared Fall Colloquium</i>	September, 2022
Department of Earth, Environmental, and Planetary Sciences	
Cagayan Museum and Historical Research Center Presentation	April, 2022
Tuguegarao City, Philippines	
Brown Alumni Club of Hawaii: <i>Back to Class Technical Event with Prof. Ibarra</i>	March, 2022
Virtual Event	
Mount Holyoke College: <i>Fall Seminar Series</i>	November, 2021
Department of Geology, Geography, and Environmental Studies	
Brown University: <i>Climate and Environment Seminar</i>	November, 2021
Department of Earth, Environmental, and Planetary Sciences	
University of Louisiana at Lafayette: <i>Spring Seminar Series</i>	April, 2021
School of Geosciences	
Kent State University: <i>Palmer Geology Lecture Series</i>	March, 2021
Department of Geology	
University of Portland: <i>Spring Semester Series</i>	February, 2021
Environmental Studies Program	

CONFERENCE ABSTRACTS (LAST 3 YEARS)

#Talk | ‡Invited Talk | *Poster | ^Student Mentee

2023

^C Kong-Johnson, **N Sekhon**, CPC David, D McGee, DE Ibarra, "Insights into paleorainfall variability in the Philippines using the geochemistry of a speleothem spanning 28 to 51 kyrs BP," *AGU Fall Meeting*, San Francisco, CA, USA

‡**N Sekhon**, ^C Kong-Johnson, ^A Gao, BK Belanger, **MJ Custado**, D McGee, S Mallick, CPC David, MCM Geronia, S Jalandoni, JB Gatdula, N Santos Dela Cruz, M Gerald Vega, JL Oster, DE Ibarra, "Developing an understanding of modern and past hydroclimate variability impacts on tropical island nations: A case study from the Philippines," *AGU Fall Meeting*, San Francisco, CA, USA

‡**N Sekhon**, ^A Gao, BK Belanger, CPC David, MCM Geronia, S Jalandoni, JB Gatdula, N Santos Dela Cruz, M Gerald Vega, DE Ibarra, "What it takes to develop speleothem records: a deep-dive into the transfer functions between climate and geochemistry in tropical cave systems from the Philippines," *Geological Society of America Fall Meeting*, Pittsburgh, PA, USA

#**N Sekhon**, ^A Gao, CPC David, MCM Geronia, S Jalandoni, JV Gatdula, NSD Cruz, DE Ibarra, "Leveraging Stable Isotope and Trace element Geochemistry From Continuous Cave Monitoring to Discern Tropical Hydroclimate Variability in the Philippines," *Goldschmidt Conference*, Lyon, France

***N Sekhon**, ^A Gao, CPC David, MCM Geronia & DE Ibarra, "Insights into tropical hydroclimate using cave dripwater and modern calcite geochemistry from multiple caves in the Philippines," *IAEA International Symposium on Isotope Hydrology*, Vienna, Austria

2022

^Marsh, C., **N. Sekhon**, T. Beach, D. McGee & D.E. Ibarra, "Late Holocene hydroclimate changes recorded in $\delta^{18}\text{O}$ of a stalagmite from Cueva De La Fabrica, Colombia," *Geological Society of America Fall Meeting*, Denver, CO, USA

#**Sekhon, N.**, ^A. Gao, J.W. Partin, S. Mallick & D.E. Ibarra, "Advancing standardization of carbonate LA-ICP-MS analyses using a speleothem sample from the tropic," *Geological Society of America Fall Meeting*, Denver, CO, USA

#**Sekhon, N.**, C.P.C. David, M.C.M. Geronia, M.J.G. Custado & D.E. Ibarra, "A 100 Year Paired River Discharge and Rainfall Data Investigation Into Tropical Droughts in the Philippines Over Interannual Timescale," *Asia Oceania Geosciences Society*, Virtual

***Sekhon, N.**, ^A. Gao, J.W. Partin, S. Mallick & D.E. Ibarra, "In-situ trace element analyses of a speleothem from the tropics to track paleoflood events through the Holocene," *Karst Records IX Climate Change Meeting*, Innsbruck, Austria

- 2021** ***Sekhon, N.**, C.P.C. David, M.C.M. Geronia, M.J.G. Custado & D.E. Ibarra,
 “Tropical drought and El Niño: historic and future river discharge analysis of the
 Philippine archipelago,” *AGU Fall Meeting*, New Orleans, Louisiana
- #**Sekhon, N.**, J. L. Banner, D. O. Breecker, D.M. Tremaine & N.R. Miller,
 “Monitoring a unique karst system over two-years (2017-2019 CE) to elucidate
 hydroclimate variables influencing the geochemistry of surface and sub-surface
 waters,” *Geological Society of America Fall Meeting*, Portland, OR, USA

TEACHING

- Spring 2024** Water in a Changing World, *Instructor*, Occidental College
- Spring 2024** Intro to Geology, *Instructor*, Occidental College
- Fall 2022** Historical Climatology and Global Climate Change, *Co-Instructor*, Brown
 University
- Spring 2020** Earth, Fire, Wind, *Teaching Assistant*, University of Texas at Austin
- Spring 2018** Field Seminar in Sustainability, *Field Teaching Assistant*, University of Texas at
 Austin
- Spring 2017** Climate: Past, Present, Future, *Teaching Assistant*, University of Texas at Austin
- Fall 2016** Sustaining A Planet, *Teaching Assistant*, University of Texas at Austin

ADVISING

- 2022-Present** Celia Kong-Johnson (B.S. Geology, Class of 2025), Brown University
 Stable Isotope data production and analyses of Colombia speleothem, C8A and
 Philippines speleothem, BH-1. Co-Advisor: Dr. Dan Ibarra
- 2021-2023** Annabelle Gao (B.S. Geology-Chemistry, Class of 2023), Brown University
 Trace element analyses and sample preparation for Holocene stalagmite from the
 Philippines. Sample preparation, post fieldwork analyses of cave monitoring data,
 post-undergraduate fieldwork assistant. Co-Advisor: Dr. Dan Ibarra
 Now: Masters Student at Centre Européen de Recherche et d’Enseignement en
 Géosciences de l’Environnement
- 2022** Christina Marsh (B.A. Environmental Analysis, Class of 2023), Pomona College
 LANS REU: Holocene Paleoclimate utilizing stable isotope records of Colombia
 speleothem C2A-1. Co-Advisor: Dr. Dan Ibarra
 Now: CLIMATE Justice Initiative Fellow at UC Irvine
- 2019** Nayong Hur (B.S. Geosciences, Class of 2019), University of Texas at Austin
 Senior Thesis: Coupling geomorphology and nutrients. Primary Advisor: Dr. Paola
 Passalacqua
 Now: Lynker Technologies
- 2018** Rachel Wright (B.S. Geosciences, Class of 2018), University of Texas at Austin
 Senior Thesis: Correlating growth banding in Texas speleothems: Paleoclimate
 Implications. Primary Advisor: Dr. Jay Banner
 Now: Hydrologic Sciences MS candidate UC Davis

2017 Kara Posso (B.S. Geosciences, Class of 2017), University of Texas at Austin
Senior Thesis: Geochemical and physical response of central Texas cave drip water to changing climate conditions. Primary Advisor: Dr. Jay Banner
Now: Consultant at Zara Environmental Consulting

FIELDWORK

‡Primary Co-Ordinator

2021-Present ‡Field campaign in the Philippines to set up cave monitoring networks in three caves (3 National Parks) for monthly cave variable collection.

Collaborators: Dr. Dan Ibarra, Dr. CPC David, Palawan Speleo Inc, Biak Na Bato National Park, Sierra Madre Outdoor Club

2017-2020 ‡Set up and led bi-monthly to bi-weekly trips to Sitting Bull Falls, New Mexico, for active cave, stream, rainfall monitoring.

Collaborators: Dr. Dan Breecker, Dr. Jay Banner, Lincoln National Forest

2017-2021 Led monthly cave monitoring trips to Inner Space Caverns, Westcave, Natural Bridge Caverns, Cave Without A Name for cave monitoring. Trained undergraduate students for the same.

Collaborator: Dr. Jay Banner

May-June 2016 Assisted with soil excavation pits in wetlands, sampling for radiocarbon and stable isotope analysis, tree IDs using DFW, water sampling, sieving anthropological sites to investigate Environmental Changes in the Maya Lowlands, Belize.

Collaborators: Dr. Tim Beach and Dr. Sheryl Beach

PRESS COVERAGE

2024 Abu Dhabi Museum of Natural History Exhibition

2023 Guest post: Pal(a)eoPERCS. EGU Blogs, Biogeosciences Division

(<https://blogs.egu.eu/divisions/bg/2023/03/28/guest-post-palaeopercs/>)

PAGES ECN North America: Show and Tell with Dr. Natasha Sekhon and Riley Havel

2022 A global palaeo-science community: an interview with Pal(a)eoPERCS.

Commun Biol 5, 978 (<https://doi.org/10.1038/s42003-022-03936-2>)

[High Country Magazine September Issue](#)

[Institute at Brown for Environment and Society Bi-Monthly Feature Article](#)

2021-2022 National Cave and Karst Research Institute Magazine, USA

2019-2020 National Cave and Karst Research Institute Magazine, USA

2017-2018 National Cave and Karst Research Institute Magazine, USA

PROFESSIONAL ENGAGEMENT AND ACTIVITIES

Peer Review

International Journal of Speleology, Journal of Geography, Geochimica et Cosmochimica Acta, Geology, Rapid Communications in Mass Spectrometry, Chemical Geology

Disciplinary

Geological Society of America Fall Meeting Co-Chair

2022; 2023

Co-Charing two topical sessions with Drs. Daniel Jones, Lewis Land, Pat Kambeises; T140. Karst Hydrology and Hydrogeology; T142. Frontiers in Karst Research

GSA Karst Division Web Manager

2023-Present

Duties include the promotion of the Karst Division during Geological Society of America meetings with booth set up and interaction with attending audience, participation in monthly meetings with the board, budget discussions, award distribution selection. Attending quarterly board meeting and maintaining the Karst Website and Twitter.

Pal(a)eoPERCS Steering Committee

2021-2024

A virtual seminar series designed to share research, build collaborations and strengthen the diverse and global paleo community. The series focuses on the research of Early Career Researchers in paleo- (ntology, ecology, ceanography, climate).

SISAL North America Regional Coordinator

2017-Present

Work with members of the North America regional team, led by Prof. Jessica Oster, to organize, compile, and interpret existing published stalagmite records from North and Central America. SISAL is a PAGES funded initiative to increase interaction between researchers interested in paleoclimatology, karst, and stalagmites.

3rd Summer School in Speleothem Sciences

2015-2017

Part of the organizing committee that consisted of speleothem graduate students from across the world. Our aim was to organize a successful and engaging Summer School in Speleothem Sciences held at CENIEH, Burgos, Spain.

Departmental

Brown University

Spring 2023

Postdoc representative for the Dean of the Graduate School Search Committee.

Selection committee member for the inaugural Postdoc Symposium Keynote Speaker.

Brown Postdoc Council

2021-2023

As Academic Co-Chair with fellow postdoc Drs. Tucker Manton, Adrian Thompson, we developed postdoc workshops geared towards academia and non-academia.

Water, Climate, Environment Seminar

2018-2019

Co-organizer with fellow graduate student, Alison Tune, of UT Austin's geoscience seminars focused on Water, Climate, and Environment research theme.

Summer Statistics School

2017-2021

Courses TA'd include Intro to Data Analysis and Graphics Using R, Introduction to SQL and Relational Database Design, Questionnaire Design and Analysis

Workshops

Carbonate Critical Zone Florida Workshop (Gainesville, Florida)

April 4-6, 2022

SISAL 5th Workshop Virtual Participant

Feb 28 – March 4, 2022

Carbonate Critical Zone Virtual Workshop	August 2020
Introduction to Remote Sensing for Tribal Lands (online)	October 6-29, 2020
HYSPLIT Workshop Participating Member (online)	June 22-25, 2020
SISAL 4 th Workshop (Xi'an, China)	October 14-18, 2019
SISAL 3 rd Workshop (Agadir, Morocco)	October 8-12, 2018
2 nd Summer School in Speleothem Sciences (Oxford, UK)	August 21-27, 2015

Professional Societies

Geological Society of America | American Geophysical Union | National Speleological Society | PAGES

Languages

English (Native, C2), Hindi (Native, C2), Punjabi (Native, C2), French (Working or Conversational, B2), Spanish (Working or Conversational, B2), Turkish (Beginner, A1)