Columbia Climate School:
Faculty & Researchers who have expressed interest in mentoring a postdoctoral researcher

NOTE: You may choose a mentor not on this list, as the list below is not an exhaustive one. Candidates are encouraged to submit original innovative ideas and research proposals. Candidates are highly encouraged to reach out to faculty members & researchers to discuss their research proposals. Additional faculty and researchers can be found on the Climate School directory.

Applications are due October 31, 2022

CS Initiative	Possible Mentors	Research focus	Relevant Poject Links
Artificial Intelligence (AI) and Climate	Jason Smerdon	One of Dr. Smerdon's current and active research projects (in collaboration with a former Postdoctoral Researcher, Justin Mankin, at Dartmouth) involves the assessment of the role that vegetation plays in hydroclimate through its influence on water and energy fluxes at the land surface. Vegetation will respond in potentially competing ways to changes in temperature, precipitation, and CO2 itself, creating uncertainty in projections of future hydroclimate. He would welcome a postdoctoral fellow who is interested in pursuing an assessment of vegetation responses to CO2 and climate changes as simulated by state of the art climate models, who could develop strong collaborations with colleagues in environmental engineering (Gentine and affiliated LEAP PIs; Columbia Water Center), DEES and E3B (Griffin and others working on plant physiology), and energy policy analysts in CGEP/SIPA who study the water/energy nexus.	Smerdon Climate Lab
Artificial Intelligence (AI) and Climate	Marco Tedesco	Dr. Tedesco's primary research will involve the use of machine learning and attribution analysis to discover relationships among socio-economic and physical drivers. For example, he will be exploring the potential impact of climate hazards on climate gentrification or he will study the relative role of the atmosphere on melting of the Greenland ice sheet. The candidate will have machine learning experience, good programming skills and teamwork attitude. Critical skills and independent attitude while working on a team are extremely important.	Coastal Reslience Network
Artificial Intelligence (AI) and Climate	Robert Pincus	Dr. Pincus' research centered on how light flowing through clear and cloudy atmospheres shapes the earth's energy and hydrologic cycles. His group often uses models including global climate models to understand the details of how human activities modify this energy flow and change temperature and precipitation; proposals extending our view of impacts would be exciting. They are also trying to understand when and how statistical methods like machine learning can add value to forecasts and projections made with physically-based models. He would be very interested in collaborating on projects that extended these ideas to societally-relevant questions like air quality or agriculture.	Clouds, Radiant Energy, Water
Artificial Intelligence (AI) and Climate	Yutian Wu	Dr. Wu's primary research aims to understand the interaction between the atmosphere and the Arctic sea ice, and more specifically how the atmospheric processes contribute to the melting of sea ice and how the melting of sea ice feeds back to the atmospheric circulation. The methodologies include the use of observations, idealized and comprehensive model experiments as well as statistical analysis and machine learning methods. He would welcome postdoctoral proposals that complement this research with their own research ideas including the understanding of ocean processes, the impact of the new Arctic on the local ecosystem, the Arctic communities and the global environment.	Dr. Wu's Personal Website
Artificial Intelligence (AI) and Climate	Daniel M Westervelt	Dr. Westervelt's research aims to use observations, remote sensing, and modeling coupled with data science techniques to close the air pollution data gap in underserved regions of the world, including sub-Saharan Africa. Postdoctoral fellows interested in environmental justice, air quality, climate change, machine learning, and computer modeling are welcome to submit their innovative proposals. Postdoctoral fellows would have the opportunity to work with a variety of Westervelt group collaborators, including the Columbia Mailman School of Public Health, the School of Engineering and Applied Sciences, the NASA Goddard Institute for Space Studies, the Data Science Institute (where he is an affiliate faculty), and numerous universities and organizations around the world.	Westervelt Aerosol Group
Artificial Intelligence (AI) and Climate	Suzana J. Camargo	Dr. Camargo's main topic of research focuses on tropical cyclones (or hurricanes) and how they relate to climate on various time-scales, from subseasonal to climate change. The research group has been focusing on tropical cyclone risk in a collaborative environment led by multiple Columbia scientists. We would like to continue developing novel modeling tools to explore the risk of extremes, including their social and economic impacts. We are seeking a postdoctoral fellow to help us develop new tools to explore these topics, as well as to improve and modify our current approaches to examine tropical cyclone risk.	Lamont Research Division: Ocean & Climate Physics
Artificial Intelligence (AI) and Climate	Michael Tippett	Dr. Tippett's primary research looks at the variability and predictability of extreme weather and climate, including tornadoes and hurricanes. A postdoctoral fellow could advance this research by, for instance, examining the relative roles of climate change and El Niño in modulating the frequency and severity of US severe thunderstorms (tornadoes, large hail, and damaging straight-line wind), a topic which is of considerable interest to the reinsurance and risk management industries. He welcomes postdoctoral proposals on related topics, including ones that focus on prediction, physics-based modeling, statistical analysis, machine learning, catastrophe modeling, and financial risk.	Dr. Tippett's Publications Page
Carbon Management	Alissa Park	Dr. Park's primary research aims to develop a new carbon capture, utilization and storage technology (e.g., direct air capture, direct ocean capture, CO2 conversion to chemicals and materials, carbon mineralization) to address climate change. A postdoctoral fellow would support this research through the design and synthesis of novel materials and the development of innovative reaction pathways for a new circular carbon economy. She would welcome postdoctoral proposals that complement this research with their own, innovative research on complementary themes exploring questions related to sustainable energy and materials.	Park Group Lab

Category	Faculty	Description	Link
Carbon Management	Beizhan Yan	The primary research of the TBD postdoc is to estimate the amount of GHG produced from plastic waste in landfills which can help better understand the magnitude of the problem and the design of sustainable solutions for plastic waste management. Leveraging the ongoing field campaign for measuring total CO_2 and CH_4 fluxes from landfills, the postdoc will evaluate the contribution of plastics vs. non-plastic waste materials to these CO_2 and CH_4 based on radioactive carbon signature and estimate the total contribution of plastic wastes in landfills to greenhouse gas emissions in the US and possibly around the world. Four Columbia researchers in the field of environmental geochemistry, atmospheric science, and sustainability science would advise the postdoc to accomplish this important study.	ResearchGate
Carbon Management	Pierre Gentine	Dr. Gentine's primary research aims is to improve monitoring and prediction of climate change. In particular, the group and collaborators' (McKinley's group) aims to provide novel estimates of carbon fluxes at the land and sea interface, in order to better monitor the variations in time and space of the natural carbon sinks. The postdoctoral researcher will lead the development of novel, consistent, land and ocean carbon monitoring product using satellite data. The estimates will be used for a new near real time carbon monitoring platform. This will provide polity maker with new tools for better climate mitigation strategies and to evaluate progress towards mitigation goals.	Learning the Earth with Artificial Intelligence and Physics (LEAP)
Carbon Management	Gisela Winckler	Dr. Winckler's research aims to understand carbon-climate dynamics, mostly focused on reconstructing natural processes on longer (paleo) timescales. I would welcome postdoctoral proposals within the larger context of marine carbon dioxide removal, including – but not limited to – connecting paleo analogues and process understanding to past, ongoing and future marine CO2 removal (e.g., iron fertilization, quantifying iron solubility and efficacy, ocean alkalinity enhancement). Innovative proposals, ranging from isotope geochemical and/or modeling approaches to exploring climate and environmental justice issues, societal perception and acceptance of marine CDR, or other complementary dimensions are encouraged.	Trace Isotope and Noble Gas Laboratory
Carbon Management	Jingguang Chen	The primary research aim of Dr. Chen's group is to reduce greenhouse gas emissions by converting CO2 and methane into either solid carbon or value-added products. A postdoctoral fellow would support this research by developing catalysts and processes for the effective conversion of CO2 and methane using renewable energy. Dr. Chen would welcome postdoctoral proposals that complement this research with their own, innovative research on complementary themes including catalyst development and techno-economic analysis.	Chen Research Group
Climate Finance and Risk	Harry Verhoeven	Dr. Verhoeven's scholarship focuses on the global political economy of climate change and explores how the world's poorest states are trying to adapt to global warming. Ambitious research on the role of sovereign debt, various types of climate finance and initiatives by the multilateral development banks in redefining adaptation and shaping the policy options available to low-income countries in Africa and elsewhere in the Global South is needed. He welcome proposals for postdoctoral work that complement this research agenda with their own, original exploration of these and related topics, including the geopolitics of energy transitions, climate and financial (in)stability, (re-)emerging powers and the international financial institutions, and Africa in multilateral climate initiatives.	Columbia Center on Global Energy Policy (CGEP)
Climate Finance and Risk	Lisa Sachs	Dr. Sachs' research aims to advance global understanding of the role of finance in addressing climate change and accelerating the energy transition, and to explore corresponding implications for integrating climate science into corporate and financial decision making, law and regulations that shape financial flows, frameworks and initiatives that define climate alignment, and legal approaches to fiduciary duty, corporate governance, and more. A postdoctoral fellow could support ongoing applied research in these interdisciplinary areas. Dr. Sachs would welcome postdoctoral proposals that complement this research agenda with their own focus on an aspect of climate finance. Post-doctoral research fellows would collaborate with other Climate School centers, including notably the Sabin Center for Climate Change Law, among others.	Columbia Center on Sustainable Investment
Coastal Viability	Frank Nitsche	Dr. Nitsche's research focuses on costal processes, especially morphology, distribution of sediments and contaminants in Long Island Sound as part of the Long Island Sound Mapping project. A postdoctoral fellow could investigate the impact of human and natural events to coastal areas, distribution of different sediment and contaminants. He would welcome postdoctoral proposals that complement ongoing research by exploring the relation and importance of this research in relation to coastal developments such as wind farms, fisheries, and other coastal uses and stakeholders.	Long Island Sound Habitat Mapping
Coastal Viability	Nicole Davi	Dr. Davi' focus of her project is to better understand how major tropical cyclone activity can be recorded in tree-ring records from coastal forests of the Northeastern United States, and to determine how vulnerable/resilient these forests are to climate change and extremes events. This paleoclimate data can also help to better understand hurricane hazards and model return frequencies. A postdoctoral fellow would support this research through field sampling, developing and analyzing tree-ring chronologies and stable isotopes ratios, connecting with tropical cyclone modelers, and by connecting to the broader coastal resilience community through publications, outreach and education.	Tree-Ring Lab
Coastal Viability	Michael S. Steckler	Dr. Steckler proposes two projects for mentoring a postdoc on coastal resilience, focused on the delicate balance between sea-level rise, land subsidence and sedimentation. One project will use dynamic models of shoreline movements and associated geomorphic change to improve projections of coastal changes in response to sea level variations, calibrated using Bayesian inversion of preserved NJ Pleistocene-Holocene stratigraphy. The other will use multiple measurements of land subsidence and landscape change (e.g., GNSS, RSET-MH, InSAR, archeological sites, etc.) in the Ganges-Brahmaputra Delta to improve spatial, temporal and depth discrimination of subsidence processes and their implications for coastal sustainability.	ResearchGate

Coastal Viability	Andrew R Juhl	Dr. Juhl is interested in the human health impacts of coastal flooding, both tidal and storm-related flooding, especially in urban areas where poor water quality may present a persistent health hazard. This research direction is at the intersection of human health, environmental microbiology and environmental geochemistry, and also connects to climate science via rising sea levels and increasing storm frequency/intensity. Dr. Juhl would therefore welcome proposals from postdoctoral candidates with expertise in human health and epidemiology and an interest in environmental contaminant exposure, or those with a background in environmental microbiology or geochemistry and an interest in applying their expertise to human health, within the context of urban flooding events.	Juhl Aquatic Ecology Lab
Coastal Viability	Adam Sobel	Dr. Sobel's research has two related but distinct streams: 1) basic dynamics of weather and climate, especially tropical phenomena such as tropical cyclones, intraseasonal oscillations, and monsoons, and 2) applied questions in climate and extreme weather risk, including risks from tropical cyclones, extreme precipitation events, and droughts, in the context of global warming, with active connections to both the private sector and nonprofit climate adaptation finance. He would welcome postdoctoral proposals that engage with these themes or extend them in new ways.	Google Scholar
Coastal Viability	Ajit Subramaniam	Dr. Subramaniam's primary research goals as an observational oceanographer are to understand how the marine ecosystem functions and can be sustainably managed. Specifically, he is interested in two areas of research: 1) Measurement/Verification/Reporting (MRV) technologies for various marine CarbonDioxide Removal (mCDR) methods being proposed through Life Cycle Analysis (LCA) of full carbon costs, technoeconomic analysis for full dollar costs, and assessing environmental harm and 2) operationalize remote sensing as a tool for water quality management to understand impacts of storms in urban seas, beginning with waters surrounding New York City. Proposals from postdoctoral candidates interested in working at the intersection of aquatic science, engineering, economics, and policy addressing these topics are welcome.	Schmidt Ocean Institute
Coastal Viability	Braddock Linsley	Dr. Linsley's team is initiating a study to measure in-situ oyster metabolism through respiration (O2 uptake) and calcification (weight changes) using mesocosms deployed at the Piermont Pier in Haverstraw Bay of the Hudson River estuary. They also plan subaerial exposure testing on oyster recruitment and health in the intertidal zone vs. oysters growing in the subtidal zone. Postdoctoral proposals to participate in and expand this developing research project are encouraged.	Dr. Linsley Personal Site
Coastal Viability	Dorothy M. Peteet	Dr. Peteet's primary research goals are to quantify the amount of vulnerable blue carbon sequestered in the wetland hotspots of the lower Hudson Valley and Long Island Sound estuaries, and to provide rates of carbon accumulation through time, with attention to ongoing sea level rise. A postdoctoral fellow would support this research through utilizing ArcGIS, measuring carbon storage rates in the lab, and exploring ways of best retaining most vulnerable carbon stores for the future. Postdoctoral proposals are welcome that are complement this research, expanding it to involve vulnerability assessment, coastal management, and economic valuation as well as other coastal resilience questions.	Goddard Institute for Space Science (GISS)
Energy Storage	Siu-Wai Chan	With the increasing demand for energy storage, maintenance of the environment, and eco-friendly fuel production, designing effective catalysts have become key to achieving high efficiency and specificity in energy and fuel conversion. Dr. Chan's project investigates novel transition-metal-modified nano-oxides and explores their catalytic properties for the production of hydrogen as well as carbon monoxide from CO2. Different combinations of hydrogen and carbon monoxide have been reacted directly to selected hydrocarbons through the Fischer-Tropsch Process since 1926. Germany used to make 15 Million Barrels of fuel annually during WWII. The F-T process creates a variety of hydrocarbons and is still commercially important.The beauty of this project when successful is that CO2 is being recycled back into fuels that use the existing infrastructure for fuel delivery. Dr. Chan's team will combine our nano-oxide knowledge and insight to design elegance and definitive experiments with environmental importance.	Chan Research Group
Energy Storage	Daniel Steingart	Dr. Steingart's primary research aims to identify, experimentally and theoretically, the asymptotic limits of cost and lifetime of intercalate structure batteries. Intercalation batteries (e.g. lithium ion, sodium ion), have deterministic reaction and side reaction pathways that allow for both life and death to be predicted and engineered, and the goal of this study to extend this system-workability to understand where the value of such systems is best in grid and transportation systems, and then design an experimental program to study the most sensitive parameter in the battery systems. He would welcome postdoctoral proposals that complement this research with their own, innovative research on complementary themes including policy relevance, economic and value chain analysis, or through exploring other electrochemical energy storage related questions.	Steingart Lab at Columbia
Energy Storage	Yuan Yang	Dr. Yang's project will focus on advanced energy storage materials and devices for grid-level energy storage, particularly on low to intermediate temperature Na-S batteries without any critical metals. A postdoc fellow would support the project by developing new solvents for the sulfur cathode and solid Na-ion electrolytes to enhance energy density, reduce the cost, and extend cycle life and safety.Dr. Yang would welcome postdoctoral proposals that complement this research with their own, innovative research on relevant themes including economic and value chain analysis, operational simulation, or through exploring other energy storage related questions.	Yang Research Group

The Food Transition	Kathrin Schilling	This exciting project aims to identify the hotspots of toxic metal (uranium and selenium) release by mapping out the spatial and temporal distribution of uranium and selenium isotope ratios or "isoscapes" from groundwater wells for Native American communities. The regional-scale isoscapes will reveal the sources and mechanisms of hazardous metal cycling in these aquifers. The project will also establish uranium and selenium isotope ratios as novel biomarkers of metal exposure in humans linked to an environmental source. A postdoctoral fellow would support this research through uranium and selenium isotope analysis of collected groundwater and biological (e.g., urine) samples. I would welcome postdoctoral proposals that complement this research with their own, innovative ideas on complementary themes including laboratory experiments and reactive transport modeling and in turn the postdoc has the opportunity work with a multidisciplinary team including geochemists, environmental and biomedical scientists as wels, to international deve	The NIEHS Center for Environmental Health and Justice in Northern Manhattan
The Food Transition	Chia-Ying Lee	Dr. Lee studies tropical cyclones and climate. Her research aims to improve our understanding of the physical processes driving the development of tropical cyclones, their predictability, the risk they pose to our society, and how climate change modulates such risk. She welcomes postdoctoral proposals that complement her research with their own, innovative ideas/approaches studying the above topics. Climate school postdoc fellowship provides a special opportunity for postdoctoral proposals that aiming to build a pathway from my work in physical science research to applications --- including disaster risk reduction, climate adaptation, and emergency management --- and maximize the benefit it brings to human society.	Lamont-Doherty Earth Observatory
The Food Transition	Joerg Schaefer	Dr. Schaefer's research is focused on the melting ice-sheet and glaciers around the globe, their impacts on coastal and down-stream communities and strategies to adapt and respond to these accelerating changes in a ways based on the principles of 'Climate Justice'. Opportunities for CS postdoctoral fellows could include: (i) Quantifying mountain glacier change on the multi-decadal scale around the globe until CE 2100, together with a list of top-priority impacts; (ii) Evaluating the first order impacts of the modern and future Artic ice-changes on local and regional communities; (iii) Analyzing the lack of diversity in Polar Geosciences and creating solution portfolios to improve this situation in the very near-future. Postdocs in the group will work within a multi-disciplinary and diverse network of climate and social scientists, climate justice experts and outreach and education experts, including students, postdocs, junior and senior faculty, film-makers and education professionals.	GreenDrill
The Food Transition	Joaquim I. Goes	Dr. Goes' primary research is focused on the development of satellite data products to understand the role of marine phytoplankton in mitigating the build-up of atmospheric CO_2. The postdoctoral fellow would be expected to develop innovative methods (GIS, statistical, machine learning, AI) to advance the utility of these satellite data products for global, regional and local energy policy, carbon pricing and carbon governance research at SIPA, and also for exploring climate change and ocean biogeochemical cycling at the LDEO.	Goes-Gomes Lab
The Food Transition	Maria Helga do Rosario Gomes	Dr. Gomes' research focuses on links between Arctic sea-ice change, North Atlantic Ocean circulation and the northward shift of North America's iconic and most valuable American lobster fishery in a warming ocean. A postdoctoral fellow would enhance this research by evaluating the impact of future environmental scenarios on lobster fisheries and coastal communities, the efficacy of current management and adaptation strategies and ability of these communities and governance systems to adapt to change. The post-doctoral fellow is encouraged to establish collaborations with researchers at SIPA, Data Science Institute, Dept. of Statistics and the Lobster Institute, U. Maine to develop and use socioeconomic indicators, diagnostic analytics, advanced bio-econometric models, machine learning and AI to achieve the objectives.	Goes-Gomes Lab
The Food Transition	Walter Baethgen	Dr. Baethgen is the PI of a World Bank funded project to advance Climate Services research and implementation for agriculture in 6 African countries (Senegal, Ethiopia, Kenya, Mali, Ghana, and Zambia). Two specific areas offer opportunities for postdoctoral research. (1) Establishing decision support systems (DSS) that use climate information (past, present and future) and crop simulation models to explore best management practices to reduce climate related risks. For example, the DSS can be used at the farm level and allow to work with "What if" questions such as what are the best management practices (planting dates, cultivars, fertilizer use) for a given farm considering seasonal and sub-seasonal climate forecasts. They can also be used at national or sub-national level to produce outlooks of crop production as early warnings of food insecurity. (2) Understand the process of embedding scientific/technological information into actual decisions and policies at different levels (from farmers, to governments, to international development agencies). For example: (a) Identifying and mapping the networks through which information flows and reaches end users, (b) understanding the needed processes of co-production, (c) understanding the language, format needed to communicate scientific knowledge and effectively inform decisions and policy.	International Research Institute for Climate and Society