Postdoctoral Research Opportunities - Great Lakes ReNEW Postdoctoral Fellowships

INSTITUTIONS HIRING:
- Northwestern University
- University of Minnesota
- University of Chicago
- Marquette University
- Illinois Institute of Technology
- Argonne National Laboratory

RESEARCH AREAS: sensors, nutrient recovery, emerging contaminants (e.g., PFAS), selective separations, materials science.

POSTDOC APPOINTMENT TERM: Fall 2024 - February 2026, with potential for renewal

SALARY: Institution dependent

APPLY:
https://forms.gle/rdHPg7UFh4GzN5ii9

The Great Lakes Water Innovation Engine (Great Lakes ReNEW) is hiring 9 postdoctoral research fellows interested in working on the selective separation of nutrients, critical minerals, and energy from wastewater. This includes sensors and sensor networks for detection of these targets and testbeds for the validation of technologies developed.

ABOUT GREAT LAKES ReNEW:

Great Lakes ReNEW was selected as part of the National Science Foundation's Inaugural Regional Innovation Engine Awards, launched in 2024. ReNEW is a six state coalition serving the Great Lakes Region focused on resource recovery and inventing new ways to extract valuable minerals and toxic forever chemicals from our wastewater.

Our mission is to accelerate the transition to a circular and inclusive blue economy, turning waste into wealth for the communities of the Great Lakes region and beyond.

ReNEW is designed to discover, develop, and deploy materials, sensors, technologies, and processes that will accelerate and enable resource recovery (e.g., nutrients, critical minerals, energy, water) from wastewater and nontraditional water sources, facilitating the delivery of cost-effective and energy efficient fit-for-purpose water.

ReNEW employs a convergent, collaborative, transdisciplinary approach to strategically engage and connect the expertise and resources of diverse stakeholders including: research institutions; minority-serving institutions (MSIs); industries; utilities; workforce development, science, technology, engineering and math (STEM) education, and entrepreneurship experts; and investors across the Great Lakes region.

Great Lakes ReNEW has three components: Use-Inspired R&D, Commercialization, and Workforce Development. Aligned, coordinated, and motivated by the shared vision and goal of achieving technologies that will preserve Great Lakes water resources and power economic opportunities, ReNEW will generate and export solutions to water challenges across the U.S. and the world.

OVERALL QUALIFICATIONS:

- Highly motivated individual with a PhD or equivalent degree is required
- Strong interest and prior record of conducting basic or translational research
- A minimum of one first-author publication
- Excellent written and oral communication skills
- Able to work both independently and collaboratively on a cross-institutional team
- Project-specific qualifications are listed below

SPECIFIC PROJECTS HIRING:

PROJECT 1: Nutrient recovery using highly-selective PEARL media

Institution: Northwestern University, McCormick School of Engineering
Principal Investigator: Dr. Vinayak Dravid
Required Skills & Experience:

- PhD in environmental engineering, materials science, chemical Engineering, or a related field.
- Experience with water treatment technologies addressing one or multiple pollutants.
- Strong background in materials characterization and surface chemistry.
- Familiarity with environmental regulations and standards related to water quality and working with real-world water treatment systems.

PROJECT 2: Carbon-based nanosensors for detecting nutrients and critical minerals.

Institution: University of Minnesota, Twin Cities
Principal Investigator: Dr. Tianhong Cui
Required Skills & Experience:

- PhD in mechanical engineering, electrical engineering, chemical engineering, environmental engineering, chemistry, or material science.
- Experience on design, simulation, fabrication, and characterization of MEMS based sensors, microfluidics, or lab-on-a-chip is preferred.
- Cleanroom experience is a plus.

PROJECT 3: Valorization of high-strength organic waste streams. This project involves R&D of a novel, sustainable system to produce value-added chemicals and biomethane for renewable energy generation from waste residuals.

Institution: Marquette University
Principal Investigator: Dr. Daniel Zitomer
Required Skills & Experience:

- PhD in environmental engineering, chemical engineering, biotechnology or a related field
- Experience in biological wastewater treatment
- Ability to perform standard water and wastewater testing
- Ability to operate bench-scale bioreactors
- Ability to prepare manuscripts for peer-reviewed journal publications
- Ability to mentor graduate and undergraduate student research assistants.

Desirable Skills & Experience:
- Experience with anaerobic biotechnology
- Ability to perform molecular techniques to characterize microbial communities including DNA extraction, amplification and purification
- Ability to perform bioinformatic processing of molecular data to characterize microbial communities.

PROJECT 4: Demonstrating Carbon Neutrality through Waste Reduction: Systems Integration and TRL Advancement for a Urine Separation Testbed

Institution: Illinois Institute of Technology
Principal Investigator: Dr. David Lampert
Required Skills & Experience:

- PhD in Environmental, Chemical, or Mechanical Engineering or a related field.
- Experience in wastewater treatment

- Water quality sensor usage and water quality analysis
- Life cycle assessment (LCA)
- Python programming and statistical analysis

PROJECT 5: Subsystem Testbed 3 (SST3): Data-driven modeling and control to optimize decentralized wet weather treatment

Institution: Marquette University
Principal Investigators: Dr. Anthony Parolari & Dr. Paige Peters (Rapid Radicals)
Required Skills & Experience:

- PhD in Civil or Environmental Engineering or a related field.
- Experience with environmental systems modeling and data analysis, such as collection system hydraulics, hydrology, stormwater, chemical/biological treatment systems; including computer programming (e.g., Python, MATLAB, R)

Desirable Skills & Experience:
- PLC programming experience preferred

PROJECT 6: Novel Materials for Critical Metal Extraction from Unconventional Water Streams

Institution: Argonne National Laboratory
Principal Investigator: Dr. Seth Darling
Required Skills & Experience:

- PhD in Chemistry, Chemical Engineering, Materials Science, or a related field.
- Membrane transport characterization
- Materials characterization (microscopy, spectroscopy, surface properties)
- Basic chemistry laboratory skills

Desirable Skills & Experience:
- Robotic/autonomous laboratory experience preferred

PROJECT 7: Detection of per-and polyfluoroalkyl substances (PFAS) and critical minerals (e.g., Li, Ni, and Co ions) in water using field-effect transistor (FET)-based sensors.

Institution: University of Chicago, Pritzker School of Molecular Engineering
Principal Investigators: Dr. Junhong Chen

Required Skills & Experience:

- PhD in Chemical Engineering, Electrical Engineering, Physics, Chemistry, Materials Science, or a related field.

Desirable Skills & Experience:

- Knowledge and working experience with PFAS
- Micro- and nano- fabrication of field-effect transistors
- Knowledge and experience in 2D nanomaterials
- Characterization techniques for 2D nanomaterials and nanodevices
- Additive manufacturing/printing of electronic devices

PROJECT 8: Bioconcentration and recovery of waste N as value-added products via encapsulation of microbial communities (2 positions available)

Institution: University of Minnesota, Twin Cities
Principal Investigator: Dr. Paige Novak
Required Skills & Experience:

- PhD in Chemical Engineering, Environmental Engineering, Biotechnology, or a related field.
- Experience culturing microorganisms or with biological wastewater treatment
- Experience with analytical techniques and colorimetric assays
- Ability to prepare manuscripts for peer-reviewed journal publications

Desirable Skills & Experience:

- Experience with DNA extraction and qPCR

Institution: Northwestern University
Principal Investigators: Drs. George Wells & Keith Tyo
Required Skills & Experience:

- PhD in Chemical Engineering,Environmental Engineering, Biotechnology, Microbiology, or a related field.
- Experience culturing microorganisms
- Experience with bioinformatics and genomics
- Ability to prepare manuscripts for peer-reviewed journal publications

HOW TO APPLY:

- Complete an application at: https://forms.gle/rdHPg7UFh4GzN5ii9
- Your application should include:
    - Cover letter explaining why you are interested and well-suited for the position and a description of career goals
    - Indication of which project(s) you are interested in
    - Curriculum vitae (including publications list)
    - Names and contact information of 3 references