UNIVERSITY OF ILLINOIS URBANA - CHAMPAIGN

Agroecosystem Sustainability Center

Call for applicants on ecosystem modeling, remote sensing, and AI: Research Scientists, Postdocs, & PhD Students

Agroecosystem Sustainability Center (ASC) at University of Illinois Urbana-Champaign (UIUC) is recruiting multiple research scientists, postdoctoral scholars and PhD students on ecosystem modeling and sensing. **ASC** is a leading research center and innovation powerhouse in advancing the monitoring and modeling of agroecosystems for improving sustainability under climate change. ASC leverages the UIUC's world-leading strengths in Agricultural Science, Computer Science, and Environmental Science. ASC scientists and students are working towards advancing science goals and technological innovations to generate real-world solutions and impacts. ASC works closely with farmers, industry and policymakers, and brings truly transdisciplinary educational and research experiences to talented students and scholars at UIUC.

ASC was founded by Dr. **Kaiyu Guan** and other leading scientists at UIUC in the area of agroecosystem sustainability. Successful candidates will work with a transdisciplinary team composed by leading experts in earth system modeling, plant physiology, biogeochemistry, hydrology, soil science, agronomy, and remote sensing, AI, including: **Lisa Ainsworth**, **Wendy Yang**, **Bin Peng**, **Andrew Margenot**, **Evan DeLucia**, **Murugesu Sivapalan**, **Sheng Wang**, **Carl Bernacchi**, **Shenlong Wang**, and **D.K. Lee**.

Examples of our recent research highlights include: (i) **"System-of-systems" solution to quantify field-level agricultural carbon outcomes** (a review); (ii) **Process modeling to quantify agroecosystem dynamics** (carbon budget, cover crop, nitrogen); (iii) **Cross-scale sensing for agroecosystem variables** (cover crop, crop nitrogen, tillage practices); (iv) **Large-scale satellite algorithms and products** (photosynthesis, evapotranspiration, marginal land, crop yield, cover crop); (v) **Water sustainability** (irrigation, excessive moisture, tile drainage).

Research Topics: Climate change and human activities are continuously affecting the agricultural ecosystem functions and services across multiple scales. To better manage agricultural ecosystems in the Anthropocene, we need to improve mechanistic understanding and prediction of ecosystem dynamics and provide a better monitoring capability to track the ecosystem changes. Research topics for these positions at ASC include:

1) Advancing ecosystem modeling (using ecosys, CESM, etc) for coupled carbon, water and nutrient cycles in agricultural ecosystems. The candidates will work on improving existing ecosystem models or developing new modules with new theories and observational evidence.

2) Advancing ecosystem remote sensing, including ground/airborne/satellite hyperspectral sensing, and big-data analytics of satellite algorithms. The candidates will work on generating new insights and data products from geospatial big data with radiative transfer modeling, computer vision, and artificial intelligence (AI).

3) Advancing Model-Data Fusion by integrating advanced modeling with data to quantify agricultural ecosystem services, e.g. GHG (N_2O, CH_4), soil health, water quality, using supercomputing and AI. The candidates will work on building or improving effective, scalable and efficient model-data fusion methods.

4) Measuring and processing gas (CO_2, N_2O, and water vapor) and energy exchange between the land surface and the atmosphere using the eddy covariance technique. The candidate will work on field data collection, conducting eddy covariance data analysis to understand the mechanistic basis of mass and energy exchange between the land surface and the atmosphere, and modeling those processes in the ecosystem models.

Research Scientists & Postdocs: Compensation and Qualifications

- **Research Scientists: $70-$100K/year with full benefits, depending on experience. This is a long-term position with 5+years support guaranteed.**
- **Postdocs: $50-$70K/year with full benefits, depending on experience.**
- **Qualifications:** (1) Applicants should have a Ph.D. in earth system and environmental science, hydrology, remote sensing, environmental engineering, atmospheric sciences, geography, mathematics, or a closely related field. Candidates will be considered if graduation with a Ph.D. is expected by the targeted starting date. (2) Prior research experiences in process-based modeling and/or remote sensing and/or eddy covariance measurements are highly preferred. (3) Strong programming skills (e.g., Python, C/C++, and/or Fortran in the Linux environment) and prior experience in supercomputing or big data analytical systems is required, as the applicant will be working routinely in supercomputer environment. (4) Excellent writing skills, demonstrated by publication records.
- To ensure full consideration, qualified candidates must send a cover letter, CV, academic evidence (i.e. transcripts of college and PhD, or others), and contact information of three references via email with the subject **"Prospective Research Scientist"**, or **"Prospective Postdoc"** to **asc-application@illinois.edu**. All requested information must be submitted to the above email in order for your application to be considered. Incomplete applications will not be reviewed. Qualified applicants will be immediately reviewed upon receiving the application while the search may continue until the position is filled. We greatly appreciate all the interested applications, but advise that only candidates shortlisted for interview will be notified of the application results. The appointment is renewed annually, contingent upon the performance. Salary is competitive and commensurate with experience in relevant research.

PhD students: Compensation and Qualifications

- **Stipend: $32K/year with benefits, plus full tuition waiver (~$30K/year).**
- **Qualifications:** Strong quantitative programming skills and domain science (such as hydrology, plant physiology, biogeochemistry, remote sensing, ecology and geography) knowledge are required for successful PhD student candidates. Proficiency in spoken/written English is mandatory. All applicants should meet the minimum requirements of GPA by graduate admission (http://www.grad.illinois.edu/admissions/apply/requirement). Information for applying to NRES can be found here: https://nres.illinois.edu/graduate/apply. International students should also meet the minimum requirements of TOEFL (the same link above). GRE is not required.
- Prospective students are strongly encouraged to contact **asc-application@illinois.edu** first with the subject "**Prospective PhD student**" to share credentials and research statement before applying. In emails, please include the following items: unofficial transcripts, curriculum vitae, GRE score (optional), names and contact information of three references, and a brief personal statement. We greatly appreciate all the interested applications, but advise that only candidates shortlisted for interview will be notified of the application results. **Starting Date**: We accept students at any time of the year, not confined to only the fall semester. Therefore, the enrollment time is **flexible**.

UIUC is a world leader in research, teaching and public engagement, distinguished by the breadth of its programs, broad academic excellence, and internationally renowned faculty and alumni. UIUC ranks top worldwide in Agricultural Science, Computer Science, and Environmental Science. Illinois serves the world by creating knowledge, preparing students for lives of impact, and finding solutions to critical societal needs. The University of Illinois is an Affirmative Action/Equal Opportunity Employer. The administration, faculty, and staff embrace diversity and are committed to attracting qualified candidates who also embrace and value diversity and inclusivity.