

George Crabtree Institute for Discovery and Sustainability



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Executive Summary

- Joint initiative between **University of Illinois Chicago (UIC)** and **Argonne National Laboratory (ANL)**
- Named after visionary scientist **George Crabtree**
- **Purpose:** Accelerate scientific discovery and workforce development
- **Strategy:** Unite complementary strengths of UIC and ANL to address urgent challenges

The Institute: Vision and Mission

Vision:

- Serve as a recognized hub for **collaborative** research and education, leveraging ANL and UIC expertise
- Foster **innovative solutions** by amplifying each institution's strengths

Mission:

- **Catalyze research collaborations** with seed funding and seamless communication
- **Develop a diverse, skilled workforce** by providing UIC students and early-career scientists access to ANL's world-class facilities

Co-Directors of the Crabtree Institute

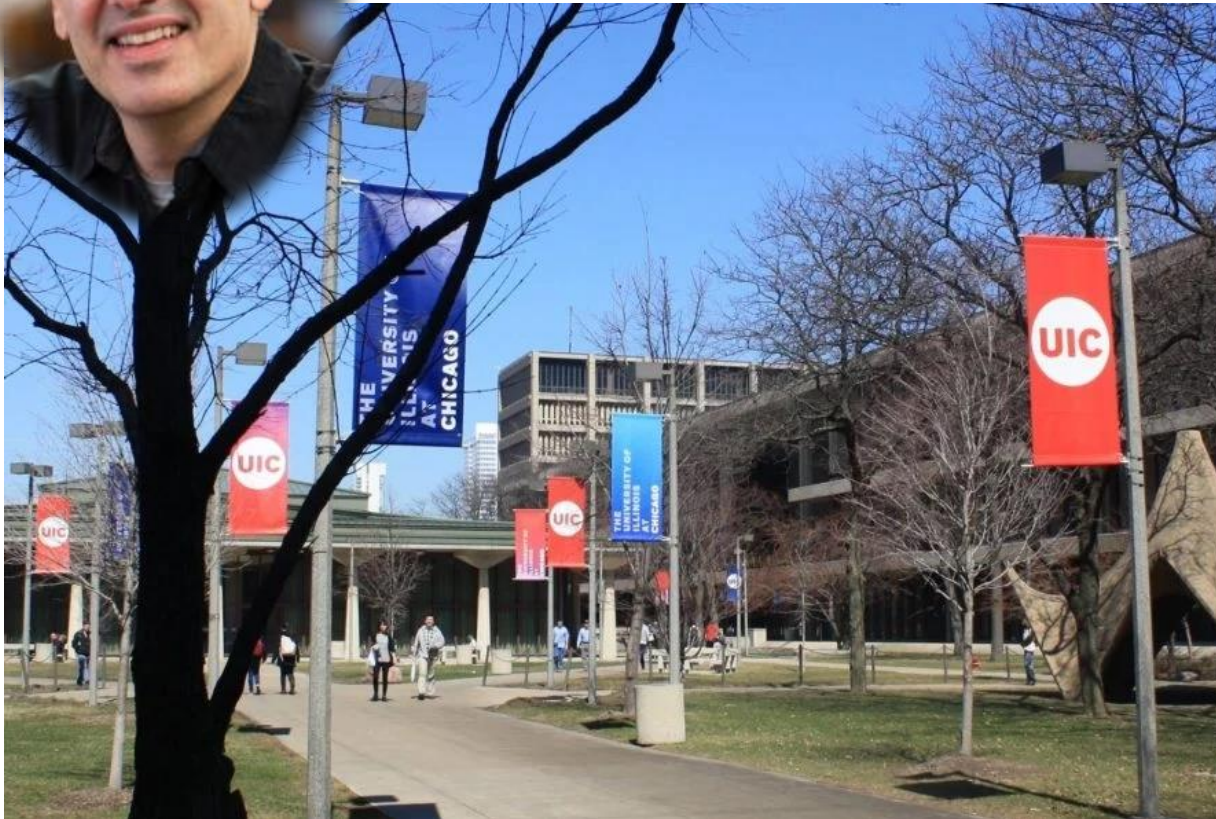
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University of Illinois Chicago



Argonne National Laboratory



George Crabtree

- **Education**

- B.S. in Science Engineering from Northwestern (1967)
- Ph.D. in Condensed Matter Physics from UIC (1974)

- **Research Contributions**

- Pioneered studies on superconducting materials and vortex dynamics
- Advanced next-gen batteries: multivalent, flow, and lithium-sulfur
- Published over 440 papers (superconductors and energy storage)

- **Argonne National Laboratory**

- Joined Argonne in 1964
- Argonne Distinguished Fellow in 1990
- Materials Science Division as Director (2001-2008)
- Directed Joint Center for Energy Storage Research (2012-2023)

- **University of Illinois Chicago**

- Distinguished Professor of Physics, Electrical and Mechanical Engineering

- **Awards and Recognition**

- Fellow of APS, NAS, and AAAS
- Awards: Kamerlingh Onnes Prize, DOE's Outstanding Scientific Accomplishment, and more

Honoring George Crabtree

- **George Crabtree:** Renowned for leadership in materials science, energy storage, and interdisciplinary collaboration
- The Institute embodies Crabtree's spirit of **creativity**, **collaboration**, and **mentorship**
- Legacy continues through **joint research, education, and outreach** initiatives
- George had profound impacts on **both ANL and UIC**. Our guiding ethos is for this institute to do the same.

Leveraging Institutional Strengths

UIC Strengths:

- Large, diverse student body and commitment to **social impact**
- Strong academic programs across **STEM, public health, policy, economics, and the arts**

ANL Strengths:

- **World-class research facilities** and technical expertise
- Leadership in **electrochemical science, multimodal imaging, advanced algorithms (AI/ML), and more**

Five-Year Activity Plan Overview

Three Phases:



- Phase 1 (Years 1–2): Foundation
- Phase 2 (Years 3–5): Growth & Expansion
- Phase 3 (Year 6+): Maturation & Sustainability

• **Goals:**

- **Remove barriers to ANL-UIC interactions**
- Establish **collaborative research** projects
- Develop programs of **workforce development** (undergraduate and graduate)
- Secure funding and partnerships for long-term sustainability

Foundation (Year 1–2):

Focused on **Infrastructure** and **Collaboration**

- Launch **UIC-ANL Transportation Voucher Program** 
 - Facilitates seamless travel for workshops, internships, and joint research
- Host **ANL Capabilities Showcase** (Spring 2025) 
 - Introduce UIC faculty/students to ANL facilities and expertise
- **Hold Data Science Frontiers Workshop**
 - Integrating data science and measurement science
- **Pilot Grants** for high-potential research collaborations
 - *This goal has involved a lot of discussion with ANL and UIC*
 - Aiming to transition 2+ pilot projects into full-scale proposals by end of Year 2

Year 3 and beyond:

- **Scale Successful Collaborations**
 - Transform pilot projects into **joint research centers** (e.g., NSF STC, DOE EFRC)
- **Expand Workforce Development**
 - Scale up undergraduate internships and interaction between UIC education and ANL research.
- **Build Community and Partnerships**
 - Organize symposia, forums, and networking events
 - Engage industry, government, and other institutions for broader collaboration
- **Stable Operations and Budget**
 - Balance multiple funding sources and create partnership agreements to ensure long-term financial health

Joint Appointments

In both cases:

- The Crabtree Institute **facilitates but cannot impose**.
- UIC and ANL **must both see the strategic benefit** of a Joint Appointment into the future (not simply a convenience).
- Particularly important at ANL, where Crabtree Institute is a virtual entity without direct personnel.



- Fill out the Argonne inbound joint appointment form
- Fill out the Crabtree Institute form



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Education and Workforce Development

- **Core to the Institute's Mission**
 - Standing up undergraduate internships in summer 2025.
 - Skills training in **cutting-edge research, leadership, and collaboration.** Incipient conversations on ANL problems driving UIC experiential learning.
 - Connect participants with senior researchers across disciplines
 - The ambition is to create cohorts from groups and institutions with fewer access to cutting-edge research resources

Foundational Workshops

- **Summer Institute for Climate and Energy (SICE)**
 - Annual, week-long deep dive into **energy, climate, policy, and sociology**
 - Targets early-career researchers and future decision-makers
 - Encourages **multidisciplinary understanding** of real-world issues
- **Next Generation Electrochemistry (NGenE)**
 - Annual, intensive program on **cutting-edge electrochemical science**
 - Educational lectures, site visits, practical activities on research articulation, networking opportunities
 - Forward looking: focuses on “*what will electrochemistry become?*”

Conclusion and Next Steps

- **George Crabtree Institute:** A legacy-driven commitment to collaborative research and education
- **Keys to Success:**
 - Strong partnerships, diversified funding, agile governance
 - Ongoing community-building and workforce development
- **Invitation:**
 - Join us in creating transformative solutions and shaping a more sustainable future
 - **Next Steps:** Engage stakeholders, secure funding, and launch additional programs

Announcement of next step: Crabtree Institute Workshop on May 14-15, 2025

- Convergent Intelligence: **Bridging AI and Measurement Science** for Next-Generation Discovery
- Hosted at UIC. Official announcement forthcoming.
- Key elements:
 - **This is not your usual collection of talks.**
 - Presentations will cover the frontiers within these fields and at their interfaces.
 - Facilitated breakout discussions between scientists at UIC and ANL.
 - Preparation for a **pilot grant program funded by the Crabtree Institute.**
- **Pilot grant vision:**
 - **Teams of 1 researcher at UIC + 1 researcher at ANL.**
 - 2 years of seed funding to nucleate a new program that can attract external funding in year 3 (similar to LDRD at ANL).
 - Topic should match the theme of the workshop.

Thank you