

Call for interest and applications:  
Waterloo Institute for Complexity and Innovation  
**External Core Members & External Node Coordinators**  
March 30, 2022

**Review of applications** continues on a quarterly basis. Applicants may be invited for external core membership, affiliate membership, and/or external node coordinator status, and may be invited for a University of Waterloo campus visit and/or WICI talk.

**The Waterloo Institute for Complexity and Innovation (WICI) invites applications for external members.** WICI is a research and networking organization, housed within the University of Waterloo (UW), which promotes innovative training and application of complex systems tools and theories to address challenges essential to human well-being, including those at the intersection of society, health and environment.

An “**external core member**” category has been generated within WICI to identify potential leaders of major external nodes. Administrative leaders of these nodes will be designated “**external node coordinators**,” and would also become external core members of WICI.

**Definitions and Application Instructions:**

**External core member:** Regular, research, or adjunct Canadian university faculty, outside the University of Waterloo, who lead a long-horizon complex systems research program and actively engage with WICI networks and activities.

**External affiliate researcher:** Affiliate Researchers are regular, research, or adjunct university faculty or non-university researchers, including post-doctoral fellows, who actively participate in institute activities, including its research projects or committees.

Applications for **external core** or **affiliate researcher** membership should include:

1. A brief statement of the applicant’s prior background and scholarship in complex systems. (250-500 words)
2. A description of the applicant’s complex systems research program and, if applicable, how that program interfaces with ongoing UW research. (500-1000 words)
3. Keywords that describe your research program: 1) Up to 3 research application areas; 2) Up to 3 methods used and 3) Up to 3 disciplinary areas with which you identify.
4. A brief statement of any additional information that would be relevant for the evaluation committee.
5. The applicant’s CV.



**External node coordinator:** External Canadian practitioner, affiliate or core members, who take an active leadership role, with institutional support, in developing and managing external nodes.

Applications for **external node coordinator** membership should include:

1. A brief statement of the applicant's prior background and scholarship in complex systems. (250-500 words)
2. A description of the applicant's vision for a local CNCS node, using the points from above as a reference, and included any additional goals/activities that the applicant envisions. (500-1000 words)
3. If applicable, a list of other researchers (including students) at your institution, or within your Canadian research networks, undertaking complex systems scholarship. For each researcher (including the applicant), identify keywords: 1) Up to 3 research application areas; 2) Up to 3 methods used and 3) Up to 3 disciplinary areas with which they identify.
4. If applicable, identification of a particular research theme that might be a focus (foci) for your node (drawing on or expanding from the list above).
5. A brief statement of any additional information that would be relevant for the evaluation committee.
6. A supporting letter from an administrator (e.g., unit head, dean, research centre director, office of research administrator, provost, or other relevant administrator). This letter should outline any internal support resources that would be available to support the local CNCS node.
7. The applicant's CV.

All application materials if possible should be minimum 11 point font, compiled into a single .pdf document, and e-mailed to Brenda Panasiak, Administrative Coordinator of WICI ([brenda.panasiak@uwaterloo.ca](mailto:brenda.panasiak@uwaterloo.ca)) with a subject line "WICI external member application-Name." As with all WICI initiatives, we strive to create a highly diverse membership in terms of research foci, perspectives, methods, gender identification, ethnicity, and capability.

Please contact WICI core member Chrystopher Nehaniv, at [cnehaniv@uwaterloo.ca](mailto:cnehaniv@uwaterloo.ca) with any questions, or if you would like to brainstorm about possible directions for a proposed node before applying. We look forward to hearing from you!

### **Appendix: Visioning and current structure for the CNCS**

Since 2018, WICI has been leading the development of a Canadian Network for Complex Systems (CNCS).

In 2019, WICI visioning identified the following active areas of complexity research at Waterloo:



- Complex systems approaches to entrepreneurship and industrial organization
- Complex coupled human-natural systems;
- Complex health systems;
- Complex risk and uncertainty;
- Multi-scale decision-making and governance for complex/wicked problems;
- Multi-scale adaptive management and optimization of complex spatial and network problems;
- Modelling cognition and decision-making;
- Resilient urban environments;
- Thresholds and tipping points in social and natural systems
- Visualization and analysis methods for complex data

Following our initial membership call, the CNCS rapidly expanded to include additional nodes and researchers. These new members enhance strength in current thematic areas and bring new thematic strengths to the network. The locations and collaborating institutions that have come forward already include four major geographic nodes with potential for strong institutional support in British Columbia (University of British Columbia, Simon Fraser University, University of Victoria and the Cascade Institute), Ontario (University of Waterloo, University of Guelph and Western University), Montreal (McGill University and University of Montreal) and Newfoundland (Memorial University). Administrative leaders of these nodes have been designated “external node coordinators” and are also external core members of WICI. A list of current external node coordinators is available on the [WICI website](https://uwaterloo.ca/complexity-innovation/about/canadian-network-complex-systems-cnccs/cnccs-nodes/external-node-coordinators). (<https://uwaterloo.ca/complexity-innovation/about/canadian-network-complex-systems-cnccs/cnccs-nodes/external-node-coordinators>)

The form, mission, and activities of CNCS are under active development. Initial discussions have identified the following goals and directions:

1. What goals/needs might CNCS serve?
  - a. **Networking:**
    - i. Identify and publicize active complex systems researchers across Canada—facilitate communication.
    - ii. Provide scholar matchmaking services (i.e., for those seeking particular expertise, data, or research support for research collaboration, student supervision and examination, and grant partnerships).
    - iii. Conduct network analysis (research) on the community of complex systems scholars.
  - b. **Education:** Provide access to “get-started” educational materials for complex systems methods to students and other researchers.
  - c. **Incentives for collaboration:** Incentivize network development, collaborative engagement and interdisciplinary research at the administrative level.



- d. **Interdisciplinary Scholarship:**
    - i. Enable a cultural shift towards community and interdisciplinary engagement.
    - ii. Reduce analytical and language barriers to facilitate collaboration across fields. Reduce barriers between theory and practice, or the abstract and the concrete.
    - iii. Bring together those with theory and tools with those with applied problems.
2. What kind of structure might CNCS have?
    - a. Roles and responsibilities of the main node—to be determined.
    - b. Decentralized nodes with a highly flexible structure, but a clearly-defined minimum hurdle for continued membership.
    - c. Given that minimum, node size/involvement can be flexibly scaled, from minimal to significant engagement (i.e., online forums, events, participation in summer schools, collaborative projects).
    - d. Have rotating activities with internal responsibility for funding (such as conferences, summer schools).
  3. What kinds of activities might CNCS support?
    - a. Identify grand challenges for complexity science that could frame national and international collaborations. Which are we working on? Which do we aspire to contribute to?
    - b. Direct support and engagement with governmental actors at all levels, to provide research support for complex management challenges.
    - c. Host methodological workshops and develop modules that could be delivered within different courses across institutions.
    - d. A summer school, with rotating hosting, was **highly** supported.
    - e. Cross-university advising and student examination.
    - f. Host retreats to deepen connections among scholars.
    - g. Communicate funding priorities to tri-council and other funding bodies.
    - h. Large, multi-institutional grant and infrastructure initiatives.
  4. How might CNCS be funded?
  5. What might CNCS mission be?
    - a. Build capacity to achieve critical mass of complex systems scholarship within Canada.
    - b. Advance the discipline broadly.
    - c. Train the next generation of complex systems thinkers.
    - d. In addition, have an applied focus – demonstrate what complex systems theory/methods applications can do.

