



# **SHARCNET Research Support Programmes: Fellowships & Dedicated Resources**

## **Application Guidelines**

### **Round IX**

## Preface

This document contains the application guide and form for applying for research support from SHARCNET. The support categories are:

- Fellowships (the available types are described in detail in the next section)
- Dedicated resources (processing time, storage allocation etc.)

<b>Applications are invited in this round in both categories</b>
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This guide specifically applies to the IX-th round (“Round IX”) of research support. In this regard, please note the following:

- Round IX applications are due on **30<sup>th</sup> September, 2008** and results will be announced in December, 2008.
- In all cases, we encourage you to apply for exactly what your needs are for research support.
- Please make sure that this document is the correct version for the current round. An up-to-date version of the guide for the current round is available from [www.sharcnet.ca/Documents/SN\\_application\\_guidelines.pdf](http://www.sharcnet.ca/Documents/SN_application_guidelines.pdf). Changes occur in the document from round to round as a result of feedback and other input.
- SHARCNET will announce Fellowship rounds to correspond with available funding.
- Applicants may also register an “intent to apply for an award” at <https://www.sharcnet.ca/my/profile/intent/>, via the SHARCNET webportal. This will add your name to a temporary mailing list; this list will be the only way in which communications (including corrections and updates) will be made about the resource allocation round after the initial email to [general@sharcnet.ca](mailto:general@sharcnet.ca). Note that completing the "intent to register" is not a requirement for submitting a Round IX application.
- In this round, proposals are also welcomed from researchers in fields or disciplines that do not normally have access to matching funding programs. Such proposals should describe what support they can secure and explain why matching funding is difficult to secure in their field.
- A separate Research Support Programmes FAQs has been created to address common questions from previous rounds. This is available online along with the application form.

# SHARCNET Research Support Programmes

## 1. Programme Objectives

- To increase the number and quality of research personnel involved in high-performance scientific computing at SHARCNET partner institutions, and/or
- To facilitate optimal exploitation of SHARCNET's computing infrastructure, leading to scientific discoveries of international significance.

## 2. Summary of Programmes

The SHARCNET research support programmes cover, at present, financial support for a wide spectrum of personnel needs for research and the allocation of dedicated computational resources such as CPU time or storage.

**Fellowships:** The personnel fellowships are:

- **Postdoctoral and Graduate Fellowships:** To assist in attracting the best trainees to work with SHARCNET researchers.
- **Undergraduate and Co-op Fellowships:** To allow excellent undergraduate students to become involved in SHARCNET research projects during the summer months, or during a co-op term within their degree program.
- **Senior Visiting Fellowships:** To attract and support world-class, "distinguished researchers" who wish to visit a SHARCNET institution for an extended period. These prestigious Fellowships may also be used to support visiting faculty on sabbatical leave from their home institution.

The main characteristics of the SHARCNET Fellowships are summarized in Table 1. In the Table, "unit values" are based on the available budget, and these amounts are subject to change in subsequent rounds. The unit values are the maxima for which SHARCNET will provide matching: *i.e.*, *SHARCNET will match at the stated fractional rate up to the maximum amount listed.*

**Table 1: Summary of SHARCNET Fellowship Programs**

<b>Program</b>	<b>Min/max term</b>	<b>Unit value (maximum)</b>	<b>Max SHARCNET contribution [%]</b>	<b>Matching contribution [%]</b>	<b>Allowable expenses</b>
Postdoctoral Fellowship	1 or 2 years	\$45,000/yr	\$22,500 [50%]	\$22,500 [50%]	Salary and benefits only
Graduate Fellowship	1 or 2 years	\$26,000/yr	\$13,000 [50%]	\$13,000 [50%]	Salary and benefits only
Undergraduate and Co-op Fellowships	Summer term (May-Aug), or appropriate Co-op term	\$7,000/term	\$7,000 [100%]	0	Salary and benefits only
Senior Visiting Fellowship	1 month to 1 year	\$45,000/yr	\$22,500 [50%]	\$22,500 [50%]	Salary, travel, lodging, subsistence

**Dedicated Resources:** The categories are:

- **CPU time allocation:** To enable high quality projects requiring large allocations of CPU time. The level of resources required for these projects is beyond that normally anticipated to be available to a project through general access (via the queuing system) in a typical 6-month period. Allocations of CPU time may be for large numbers of CPU-hours on either parallel systems (for “capability” applications) or on throughput facilities.
- **Storage allocation:** To provide large amounts of data storage and/or data storage for extended periods for specific high-quality projects.

Note that dedicated resources are for specific projects, not to provide resource “envelopes” for multiple projects. All CPU use at SHARCNET, obtained through either general access or dedicated time, remains free at present. Resource thresholds required to qualify for dedicated allocations are flexible and may change with time. For the present round the target thresholds are given in Table 2.

**Table 2: Summary of SHARCNET target thresholds for dedicated resources**

<b>Resource</b>	<b>Target Threshold</b>
Dedicated CPU time	More than 100,000 cpu-hours for “capability” applications on clusters; more than 30,000 hours on the 128 processor SMP system; more than 200,000 cpu-hours for “throughput” applications
Dedicated storage	More than 15TB for more than 6 months

### 3. How to Apply

#### Eligibility

**Fellowships:** Only full-time faculty at SHARCNET partner institutions eligible for funding may apply. The SHARCNET partners are: Brock University, Lakehead University, Laurentian University, McMaster University, Nipissing University, Ontario College of Art & Design, The University of Western Ontario, Trent University, University of Guelph, University of Ontario Institute of Technology, University of Waterloo, University of Windsor, Wilfrid Laurier University, York University, Fanshawe College, Sheridan College and Perimeter Institute.

**Dedicated Resources:** Applications for dedicated resources are open to all faculty applicants with a valid SHARCNET account.

#### Applications

Complete the online application form (a sample is included at the end of this document and is available from the SHARCNET website), plus submit additional material as indicated on the form. All application materials will be treated as confidential.

For undergraduate, graduate and postdoctoral fellowships, the identity of the candidate to be funded need not be known at the time of application. This allows the applicant to wait until the funds are awarded before commencing a search for a candidate. However, in the case of a postdoctoral Fellowship, if the candidate is known, her/his CV should be included in the application.

For senior visitors, the applying faculty member must nominate a specific visitor at the time of application, and provide a CV.

Applicants must submit all materials (including CV's) electronically using the web form to be found at [www.sharcnet.ca/Portal/resource\\_application/](http://www.sharcnet.ca/Portal/resource_application/). If you have difficulty with the electronic submission, please contact the SHARCNET office.

When you have completed the online application, you will be able to print a formatted hardcopy from your web browser.

***In addition, for each Fellowship application, we require sign-off by the appropriate Research Office in advance of a potential award. For this reason, applicants must also send a hard copy of their Fellowship application to their Chair and/or Dean for signature and subsequently to their Research Office. This can be done in parallel with the submission to SHARCNET. We will continue with the application evaluation process and coordinate with the relevant Research Offices to verify which applications have institutional support.***

Questions regarding the application process or form may be directed to the SHARCNET office at (519) 661-4000 or e-mail [research-support@sharcnet.ca](mailto:research-support@sharcnet.ca).

## Curriculum vitae

When providing CV's, no specific format is required. We suggest submitting an NSERC Form 100, Parts I and II. However, any reasonably analogous document with equivalent information is acceptable.

## Project Description

***Note the page length restrictions on the application form. Any submitted material in excess of the stated maximum will be ignored.***

The overarching criterion for consideration of applications is their potential to generate high-impact research results that will advance SHARCNET's status as a world-class centre for high-performance scientific computing. As a consequence, consider the following when preparing your project description:

- ***Projects with the potential to bring new HPC methods and skills into the community*** (i.e. research that will bring expertise and techniques into SHARCNET that are likely to benefit other researchers) ***are especially valuable.***
- Applicants should specify the anticipated outcomes in concrete terms. For example, give the names of journals in which you anticipate publishing results; or, quantify the degree to which the proposed work is world-class (e.g. a bio-molecular simulation that will set a new world record for system size).
- If appropriate, describe the potential for development of intellectual property, or new relationships with private sector firms.
- Applicants should estimate the computational needs of the proposed research. Ambitious projects that will establish a new standard within their field are encouraged. On the other hand, if for success a project requires all of SHARCNET's processing power for a year, it is not likely to be funded/awarded. Remember that SHARCNET is a shared resource.
- Applicants for dedicated resources should note, in addition to the above guidelines, the specific requirements for such applications (see Section 5).

## Key papers

Applicants may list up to three key papers that demonstrate their research impacts in the field of the application (or in a closely related field). Complete bibliographic details should be provided.

## Outcomes from previous SHARCNET Awards

Applicants who have received allocations of resources (fellowships or dedicated time) from SHARCNET in past competitions ***must describe the research and/or other outcomes resulting from the award.*** For each person supported, either wholly or in part, by the award, please list: name, academic rank or level (undergraduate, graduate, postdoctoral fellow, visiting associate professor etc.) and current position. Please provide full bibliographic details of all publications as well as any awards or special recognition resulting from the allocation. You may also describe any extenuating circumstances that prevented timely publication of results. These details will be critical for those researchers who are requesting funding and have received Fellowship funds in previous rounds!

## **Suggested reviewers**

Applications will be sent out for peer review to up to three reviewers. Applicants should list on the form three suggested reviewers who can give an informed opinion of the proposal. The suggested reviewers should be “arms-length” in that the reviewer should not:

- be from the same university (or associated institution) as the applicant
- have a personal relationship with the applicant (close friend, relative)
- have been a research supervisor or graduate student of the applicant within the last 6 years
- have been the applicant’s Ph.D. (or equivalent) supervisor
- have collaborated with the applicant in the last six years or have plans to collaborate in the near future
- be in a position to gain financially from the application

The selection committee will endeavour to use at least one of the suggested reviewers, but may select additional or alternate reviewers as it feels appropriate.

## **Deadlines**

**The deadline for Round IX applications is 30<sup>th</sup> September, 2008.**

Results will be announced within approximately 8-10 weeks of each application deadline.

## **Multiple Applications**

Faculty may submit multiple applications in a single Round. However, the applicant must clearly state if the applications are related. If they are unrelated, each application will be assessed separately.

If they are related, the applicant must indicate if the project can be implemented successfully in the event that not all of the applications are funded or approved. The applicant should prioritize each request according to their importance to the project. Multiple related applications will only be supported in exceptional cases, when a compelling case exists that an excellent project cannot proceed without multiple sources of support from SHARCNET.

In some circumstances related applications may be made for both fellowship support and dedicated resources. These must be made as separate applications, but the relationship should be noted. Bear in mind, however, that coupling such applications may not be realistic since the timescale for hiring personnel may be more than six months, whereas the time for using dedicated resources will be at most six months from the time of the award.

Each application must be made on a separate form and must be self contained.

## 4. Budgetary Issues for Fellowships

### Proposed Budgets

Unit values of the various Fellowship programs in Table 1 are upper bounds. You should apply for the actual amount needed to support your project. It is recognized that student stipends vary widely by discipline.

### Matching Funds

The graduate, postdoctoral and senior visiting Fellowships all require the applicant to contribute matching funds: for every \$1 of matching funds, \$1 of **SHARCNET** funds is available. These funds must satisfy eligibility requirements as either “institutional” or “private sector” matching funds.

Note that matching funds must be spent on the eligible expenses shown in Table 1. For example, NSERC equipment grant funds used to provide a workstation for use by a postdoc are not eligible for use as matching funds for a **SHARCNET** postdoctoral Fellowship.

Note also that you may apply for support for personnel who are already working for you. If you have already contributed to their salary and benefits from eligible matching sources, some of this money may be matched, if the expenditure falls within the Fellowship funding period.

Examples of eligible matching funds are:

- NSERC funds (e.g., Discovery Grant, CRDG) paid to a student or postdoc (or from any other grant from a federal agency).
- Ontario government grants (e.g. ERA, MMO)
- Teaching assistance support of graduate students may be eligible. Please consult the Research Office at your local institution or the **SHARCNET** office to determine if this is the case.
- University scholarships paid to graduate students.
- Funds provided by a private sector research partner, if intellectual property rights are retained by the university researcher.
- Faculty start-up grants.
- Institutional operating funds (i.e. a Dean or Chair can contribute funding from her/his departmental budgets).

Ineligible sources include:

- Non-university-source fellowships or scholarships (e.g. NSERC, OGS, OGSST) that are paid directly to a student or postdoc.
- Payments for contract research where the resulting intellectual property is owned by a private firm.

Applicants should clearly state the source of matching funds, so that **SHARCNET** can determine if the match is eligible or not. If you are unsure about the eligibility or otherwise of your proposed matching funds you should contact the **SHARCNET** office.



In this round, proposals are also welcomed from researchers in fields or disciplines that do not normally have access to matching funding programs. Such proposals should describe what support they can secure and explain why matching funding is difficult to secure in their field.

### **Graduate Students and Postdoctoral Fellows**

Graduate students and postdocs chosen for **SHARCNET** Fellowships may also hold NSERC, OGS, OGSST, or other major scholarships. If this is the case, **SHARCNET** must be informed at the time when the candidate is chosen. The amount requested from **SHARCNET** must then be justified, and perhaps revised, by the applicant in light of this additional funding.

**SHARCNET** Fellowships may be used to provide candidates with higher than normal salaries, in order to attract and retain the very best trainees. However, it is (for example) unlikely that **SHARCNET** will agree to pay an additional \$45,000/yr to a postdoc who already holds an NSERC Fellowship worth \$35,000/yr. In such cases, if the application is successful, **SHARCNET** will consult with the faculty member to determine an appropriate level of **SHARCNET** Fellowship support.

In the case of a graduate student holding a major scholarship, a **SHARCNET** Fellowship may also be used to provide more competitive compensation. Another use might be to replace the value of a teaching assistantship, allowing the student to devote their full time to research.

## **5. Applications for Dedicated Resources**

### **Proposed Allocations**

The targets identified in Table 2 are guidelines, you should propose what is needed for the project to completed. The amount of resources awarded may be different than the amount requested if the committee feels such variation is justified.

### **Application Process**

All applications for dedicated resources must clearly demonstrate the need for the requested resources and the ability to use these resources efficiently (in terms of, for example, effective compression of data or appropriate scaling and efficiency of parallel code). All applicants must, prior to submission of the application, consult with one of the **SHARCNET** HPC Consultants to: a) determine the appropriate resource and amount of that resource to be requested; and b) to work with the staff member to demonstrate that the resources will, if awarded, be used efficiently.

The staff member so consulted must be named on the form in the space provided. The staff member will forward separately to the selection committee a brief report on the suitability of the application for the resource requested and include a technical assessment of the feasibility of the project. Since this process may require a significant amount of the staff member's time and since s/he may have to deal with several applications before the submission deadline, applicants are strongly encouraged to begin the process well ahead of the submission time. Applications will not be considered without the staff member's technical report.

## Specific points to be addressed in the application

Estimate your requirements carefully: exhausting an allocation before completing a project will not result in the awarding of any additional resources. Applicants should specifically address the following questions as appropriate to their requests:

- What is the applicant's level of experience in large-scale HPC?
- Is the proposed algorithm and implementation internationally competitive?
- Does the algorithmic implementation show good node efficiency and scaling to the number of nodes requested? Have these qualities been explicitly demonstrated?
- Is the amount of storage requested justified or can fewer outputs be stored or the data compressed?
- Can any program output be analysed effectively and how will this be done?

The above points should be addressed in parts 5b and 6 of the application **in addition** to the usual careful scientific justification given in part 5a. It should be noted that the **SHARCNET** technical staff reviewer will address these same questions in her/his report and provide an overall assessment of the feasibility of the project being completed during the allocation period.

## Duration of Award

Awards for CPU time will normally be valid for 6 months. If the allocation is not used by the 6 month deadline, any unused part of the allocation is forfeit. Successful applicants should note that failure to expend the full allocation as a result of congestion at the end of an allocation period will not be grounds for extending an award. There will be no carry-over of time; spend your allocation early!

Storage usage can be for longer than six months. Applicants need to clearly state and justify their storage requirements, including length of time.

## 6. After Awards Are Announced

### Feedback on applications

Applicants will receive brief comments on their applications that will summarise the reasons for the committee's recommendation and may include the external reviewers' reports and specific comments from the report of the **SHARCNET** HPC consultant.

## Follow-up

In the case of undergraduate, graduate and postdoctoral Fellowships, the awardee will notify the SHARCNET office when an appropriate candidate has been chosen, provide their name, and if a postdoc, submit their CV.

In addition, the awardee and the supported personnel will be asked to confirm if any other major scholarship or fellowship support (totaling more than \$5,000) is to be received during their tenure as a SHARCNET Fellow. If so, the value of SHARCNET support may need to be reduced.

All awardees are required to submit a one-page report describing the research accomplished. This report is due annually on the anniversary date for commencing expenditure of the award; or immediately at the end of the support period, for periods of less than one year.

Awardees are also expected to acknowledge SHARCNET support in journal publications or presentations describing their research. Suggested wording for this acknowledgement may be found at [www.sharcnet.ca/Portal/publications/](http://www.sharcnet.ca/Portal/publications/).

## Payment

- Students and postdocs: Payments are made directly to supported personnel from the SHARCNET account established at their home institution.
- Senior Visitors: Payments are made directly to the visitor.

## 7. How Decisions Are Made

Recommendations for awards are made by the Resource Allocation Committee (RAC). Applications will also be sent out for peer review. In making recommendations, the RAC will take into account how well the application satisfies the selection criteria detailed earlier as well as the reviewers' reports. The RAC consists of at least one full-time faculty member from each of at least six partner institutions. Faculty members are nominated and selected for their ability to judge the quality and fit with SHARCNET objectives of the proposed research and to cover a range of disciplines.

The RAC is constituted so that the major areas of SHARCNET supported research are represented. To achieve this, a number of potential RAC members are nominated from each partner institution, often in consultation with the Site Leader and institutional Board member. The draft RAC is selected from the list of nominated candidates, and is submitted to the Board for comment, modification and eventual approval. Appointments to the RAC are for one year, with the possibility of renewal. The membership of the RAC is available at: [www.sharcnet.ca/About/committees.php](http://www.sharcnet.ca/About/committees.php).

Note that, in making decisions, the members of the RAC do not represent or advocate for their home institutions. Rather, they represent a research area, and each is expected to take a leading role in assessing applications in that area, from across all the partner institutions. The primary research areas include:

- Physics
- Chemistry

- Engineering
- Mathematics (including finance)
- Computer Science
- Biocomputation

Other areas of expertise may be added as required.

In each competition, an application will be assessed in detail by two RAC members most appropriate for the field of the proposal. However, all RAC members will review and discuss the application. It is likely that RAC members will also consult with external experts as needed.

When preparing their project descriptions, applicants should bear in mind that their principal audience is the RAC: a group of scientists knowledgeable in the uses high-performance computing, but not necessarily expert in the research area of the applicant. *Therefore, project descriptions should not use highly specialized language, and should clearly state the motivation, methods, and expected outcomes of the research.*

After all applications have been discussed, the RAC ranks the applications within each category of Research Support. This ranking, along with appropriate comments, is submitted to the Scientific Director.

The Scientific Director then reviews the ranking and comments of the RAC with the RAC Chair, and in combination with budgetary and other resource constraints, makes a recommendation on which applications to support. This recommendation is submitted to the SHARCNET Board of Directors for final approval. SHARCNET then notifies applicants of the results.

**Ranking Criteria (in order of importance):**

1. Excellence of the research.
2. Potential to bring new expertise, methodologies and/or applications in high-performance computing into the SHARCNET community.
3. Appropriateness of budget *or* appropriateness of and need for allocation request.
4. Distribution of previously awarded Research Support across subject areas.
5. Distribution of previously awarded Research Support across the partner institutions.



## SAMPLE Fellowship Application Form (Round IX)

*(the actual application must be made online and could differ slightly from the format below)*

<b>1. Applicant Information</b>	
Last Name:	First Name:
Institution:	Department:
Telephone:	FAX:
E-mail Address:	

<b>2. Program Applied For</b> (check or highlight one)
<input type="checkbox"/> Senior Visiting Fellowship <input type="checkbox"/> Postdoctoral Fellowship <input type="checkbox"/> Graduate Fellowship <input type="checkbox"/> Undergraduate Fellowship <input type="checkbox"/> Dedicated Resources

<b>3. Budget</b>	<b>OR</b>	<b>3. Allocation</b>
Total budget required:		System on which allocation is requested:
Amount requested from SHARCNET:		CPU time requested:
Amount and source of matching funds:		Storage required:
Expected start date:		Time storage required:
Duration of support required:		

<b>4. Title of Research Project</b>

**5a. Description of Research Project:** Describe the research project, justifying its significance and potential impact.  
*The online form will permit a maximum of 500 words.*

SAMPLE ONLY

**5b. Research Methodology:** Describe the computational techniques and methodology to be exploited to do the research. Estimate the total computational requirements (cpu hours & storage), justifying what is needed and how long storage is required. Indicate if the computational needs are for serial or parallel computation. Applicants should clarify if code will be parallelized, and if so, what will be the method for doing so. When known, describe how other SHARCNET researchers might benefit from the development and use of the techniques that you will implement.

*The online form will permit a maximum of 500 words.*

SAMPLE ONLY

**6. Budget (or Allocation) Justification:** Use this section to provide detailed budget (or allocation) justification of your request.  
*The online form will permit a maximum of 250 words.*

**7. Key papers:** Applicants may list up to 3 key papers that demonstrate his/her impact in the field of the application or in a closely related field

**8. Outcomes from previous SHARCNET awards:** If relevant, applicants should list: personnel supported; resulting publications; awards etc.; and any special results of significance achieved or reasons for delay.

Name: Online form will allow multiple entries	Academic level/rank: Graduate, PDF, Visiting Asst. Prof. etc.	Present position

**Publications:** Online form will allow multiple entries

**Other comments:** Special significance of work, awards or reasons for delayed publication/reporting. *Max 150 words.*

**9. Suggested reviewers:** Please list the names, email addresses and telephone numbers of 3 arms-length reviewers who can assess your application. *The definition of arms-length is given in the guidelines.*

	Name	Email	Telephone
1			
2			
3			



**Additional Form Information:**

- All applications: CV of applicant (e.g. NSERC Form 100, Parts I and II; CFI CV; or equivalents)
- Senior Visiting Fellowship: Name and CV of Visitor.
- Postdoctoral Fellowships: If known, provide name and CV of candidate.
- Undergraduate and Graduate Fellowships: Nothing else is required, but CVs can be attached, if known.
- Dedicated Resources: Name of **SHARCNET** technical staff reviewer:

**Submit To:**

Applications should be submitted electronically via the web form available at [www.sharcnet.ca/Portal/resource\\_application/](http://www.sharcnet.ca/Portal/resource_application/). If you have any questions regarding the process, please contact the **SHARCNET** office at (519) 661-4000 or email [research-support@sharcnet.ca](mailto:research-support@sharcnet.ca).

Institutional Signoff (not required for Dedicated Resource Allocations):

Chair: \_\_\_\_\_ Date: \_\_\_\_\_

Dean: \_\_\_\_\_ Date: \_\_\_\_\_

Research Office: \_\_\_\_\_ Date: \_\_\_\_\_

Instructions for Research Office: Signed off application forms should be sent to the SHARCNET Resource Allocation Committee, Western Science Centre, Room 143, The University of Western Ontario, London, Ontario, Canada, N6A 5B7.