

ADVANCED COMPUTING AND CONSULTING SERVICES

NEW FACULTY FLYER

High-Performance Computing Services

Cloud Computing Services

National Resources

Storage Services

Web, Database, Programming and Code Improvement Consulting

Education and Outreach Consulting



CORNELL UNIVERSITY
CENTER FOR ADVANCED COMPUTING
(CAC)

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VISIT US AT WWW.CAC.CORNELL.EDU



ADVANCED COMPUTING

ENABLING YOUR SUCCESS

“The effective use of research IT is helping Cornell faculty secure more grants, attract top students, and seamlessly collaborate with researchers from around the globe.”

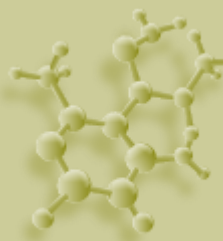
David Lifka, Director, Cornell Center for Advanced Computing

Since the advent of the computer, information technology (IT) innovations have helped to redefine and transform the research process, accelerating scientific insight and discovery. Besides making research more productive, IT innovations play an essential role in education and outreach. Outreach that used to be limited to only occasional seminars or summer workshops is being supplemented by online Virtual Workshops and Science Gateways that are available 24x7. Researchers that used to work alone with their own data are increasingly working in distributed teams with data from many studies. Even within research groups, IT is transforming communications with wikis and web portals that capture research activities in near real-time and increase group retention and cohesiveness.

IMPACTING SCIENCE & THE HUMANITIES

Research IT and computation first made a major impact in the field of physics, followed by chemistry, and then biology. Today, all disciplines are embracing computation to enrich and enable research discoveries, education, and outreach. A few examples at Cornell:

- **College of Human Ecology** researchers chose the Cornell Virtual Workshop online learning platform developed by CAC to deliver web-based courses as part of a cyber-enabled learning environment for studying language development in children.
- **arXiv**, a free scientific repository that is revolutionizing the way scientists share information, contracted with CAC staff programmers to improve classification, analysis and navigation tools.
- **Northeast Regional Climate Center** researchers worked with CAC database consultants to reduce data handling and provide fast access to high resolution weather data linked to an online tool called Adapt-N. Farmers use Adapt-N to accurately estimate their nitrogen needs, spending less money on fertilizer and decreasing nitrous oxide, a potent greenhouse gas.
- **Johnson Graduate School of Management** operations management researchers accelerated their investigation of the effect of patient no-shows on scheduling policies using CAC high-performance computing services.
- **ILR School’s Labor Dynamics Institute** received an NSF grant to bridge public and confidential knowledge repositories, allowing social scientists better access to information on labor networks already collected by the Census Bureau. This project is being conducted in conjunction with the Cornell Institute of Social and Economic Research (CISER). CAC hosts CISER’s synthetic data server and Social Science Gateway in Cornell’s primary machine room located in Rhodes Hall.
- **National Data Archive on Child Abuse and Neglect** staff asked our consultants to design and develop a web portal complete with user registration and query tools in order to enhance the productivity of US researchers accessing datasets from a database server hosted by CAC.



HIGH-PERFORMANCE COMPUTING SERVICES

Research groups who have procured their own HPC cluster may house it in Cornell's primary machine room on the 7th floor of Rhodes Hall. CAC's professional systems staff will provide systems maintenance for your cluster so you can focus on your research rather than the technology enabling it, i.e., software server and network maintenance, power, cooling, etc. Departments using this service include Applied and Engineering Physics, Astronomy, Biomedical Engineering, Chemistry, Civil and Environmental Engineering, Computer Science, Mechanical and Aerospace Engineering, Molecular Biology and Genetics, and Statistical Science. Many researchers also lease a portion of a web server from CAC for research wikis, web site, databases, etc. This is a cost-effective way to meet your server needs and leverage our systems staff. Servers may be populated, administered or updated by CAC consultants.

**PRIVATE CLUSTER MAINTENANCE
WEB SERVICE LEASES**

CLOUD COMPUTING SERVICES

Red Cloud provides virtual servers and storage on-demand for research computing, education, and outreach. Deploy in minutes 1, 2, 4, 8, or 12 core virtual servers with 4GB/core RAM and up to 1TB virtual disk. Use cases include academic labs, bursting, event-driven science, high throughput, embarrassingly parallel workloads, research wikis, and Science Gateways. We also offer a separate cloud computing service for MATLAB users called Red Cloud with MATLAB. If you require a private cloud, we can design, deploy, and maintain it for you. Cloud computing consulting is available as an option.

**RED CLOUD
RED CLOUD WITH MATLAB
PRIVATE CLOUDS**





NATIONAL RESOURCES

Cornell faculty, staff, and students benefit from our role as a partner in the National Science Foundation XSEDE supercomputing program.

**XSEDE CAMPUS CHAMPION AT CAC
ON CAMPUS TRAINING WORKSHOPS
24x7 VIRTUAL WORKSHOPS**



STORAGE SERVICES

CAC operates a high-performance, large-capacity DataDirect Networks (DDN) S2A9900 storage system. Faculty with big data can reduce storage costs by leasing DDN disk slots. Low-cost archival storage is also available with fast tunable parallel file transfers via Globus Online.

**HIGH-PERFORMANCE FILE STORAGE
DISK SLOT LEASES
LOW-COST ARCHIVAL STORAGE**



WEB, DATABASE, PROGRAMMING & CODE IMPROVEMENT CONSULTING

CAC builds easy-to-use web portals/tools. We also design and deploy web sites with database back ends that enable fast queries. Professional programmers and code improvement consultants are available to write or optimize your code. Faculty use this consulting service to meet grant deliverables faster and more efficiently.

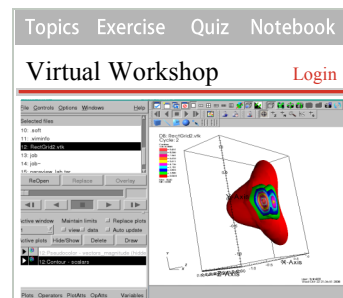
**WEB PORTALS AND WEB-BASED TOOLS
DATABASE DESIGN
PROGRAMMING/CODE OPTIMIZATION**



EDUCATION AND OUTREACH CONSULTING

If you wish to increase the number of students, citizen scientists, or other populations participating in the education or outreach components of a grant, consider adding a Virtual Workshop to the broader impact section of your proposal. You provide the content and we'll create, deliver, and maintain a highly-interactive Virtual Workshop to meet your needs. Usage statistics can be automatically generated for funding agency reports.

**VIRTUAL WORKSHOPS FOR SCIENCE & HUMANITIES
CUSTOM TRAINING WORKSHOPS**



PARTNER WITH CAC

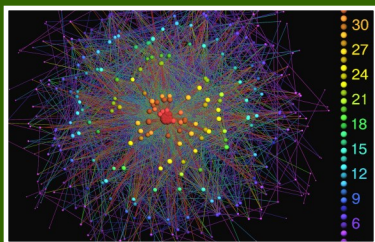
WINNING IDEAS

Partnering with CAC on your proposals is simple and easy. We will respond to your proposal needs quickly with the ideas, energy, and support you need to win and deliver.

CREDIBILITY

We have credibility with funding agencies and a history of innovations in research IT. For example:

- CAC's director was named systems architecture and design coordinator for XSEDE, NSF's national cyberinfrastructure program.
- CAC received an IDC HPC Innovation Excellence Award sponsored by DOE, NSF, and the Council on Competitiveness for a parallel MATLAB computing system that enabled large-scale Hepatitis C research.



- Red Hat Innovation Award for best storage implementation.
- Universities, NSF, DOD, and industry contract with CAC to develop online training workshops using our Cornell Virtual Workshop platform.

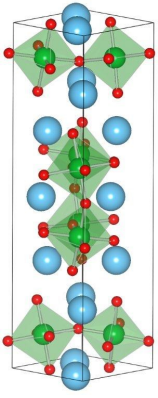
- CAC won ACM Gordon Bell Prizes for the Price/Performance of engineering applications.
- Best Protein Folding Match Award for simulating HdeA found in E. coli (using the national resource previously operated by our center for the NIH).
- Configured and deployed the first supercomputer built by Dell and developed scheduling tools.
- Operated and maintained web servers for the US Olympics in Atlanta.
- Helped architect and subsequently deployed IBM's first scalable parallel supercomputer.
- CAC received a major New York State grant used to fund the construction of Frank H.T. Rhodes Hall and our extensive Microsoft partnerships helped Cornell CIS secure funding for Gates Hall.

ECONOMIES OF SCALE

Economies of scale help proposals compete.

CAC can provide you the staff skills you need, right when you need them. For example, rather than hiring a full time person, you can contract for a fraction of an FTE with CAC.

Similarly, you can access our computing services to save time and energy. If you have enough work to warrant buying your own HPC cluster, CAC can house and maintain it so that you can focus on your research.



ABOUT CAC

“Research excellence is mission critical at Cornell. CAC is a core service center that faculty, staff, and student researchers leverage to increase the competitiveness of their research proposals and achieve innovation and broader impact goals more efficiently and effectively.”

Robert Buhrman, Senior Vice Provost for Research

The Cornell University Center for Advanced Computing is a leader in high-performance computing systems, applications, and data solutions that enable research success. As an early technology adopter, CAC helps Cornell faculty accelerate insight and discovery. As an online education expert, CAC delivers Cornell Virtual Workshops and designs web portals and science gateways that broaden impact.

CAC serves faculty from dozens of disciplines at the Ithaca campus and at Weill Cornell Medical College, including biology, behavioral and social sciences, computer and information science, engineering, mathematics, physical sciences, and the humanities. Our staff has extensive experience in HPC systems and storage, application tuning, optimization, parallelization, computer programming, database systems, data analysis, workflow management, and visualization.

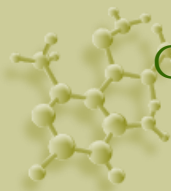
CAC reports to the Senior Vice Provost for Research and is a core research center of Cornell University.

STAYING FOCUSED

“CAC high-performance computing services keep us focused on our research goals—the understanding of complex oxide materials that could lead to novel electronic and magnetic devices.”

*Craig Fennie Research Group,
Applied and Engineering Physics*





CONTACT US

INQUIRIES WELCOME



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