

Building Content Communities in Computational Science Education

Shodor continues to use CSERD materials and other NSDL resources to educate and train K-12 and undergraduate faculty and students in the use of technologies, techniques, and tools of information technology, within the context of STEM, and with a specific focus on computational science.



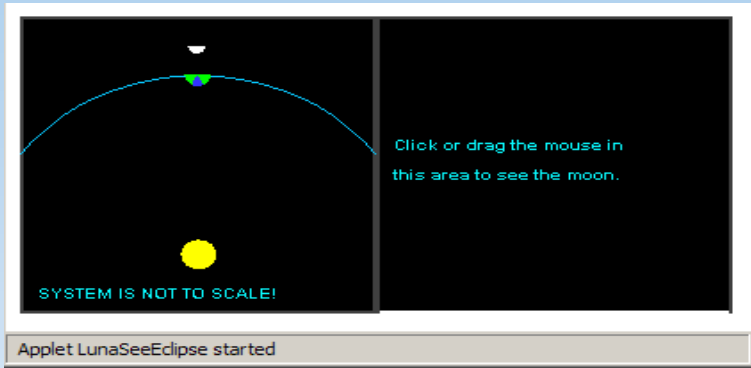
What is the Computational Science Education Reference Desk (CSERD)?

- CSERD is a digital library; A Pathways project of the National Science Digital Library (NSDL); Funded by NSF
- It is a resource to help students learn about **Computational Science (CS)** and to help teachers incorporate CS into the classroom
- Target Audience: K-12, undergraduate, graduate and informal math and science programs

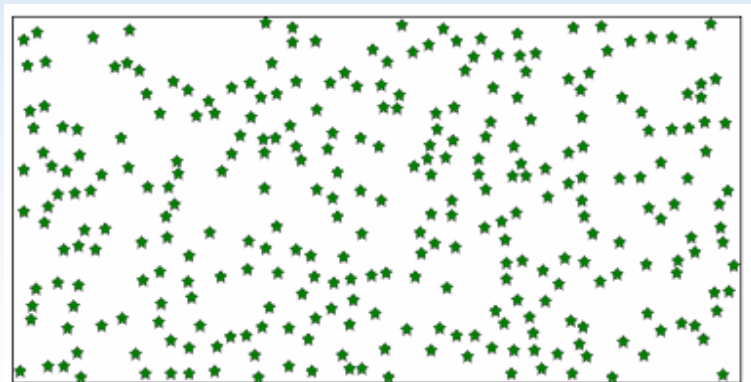
<http://nsdl.cserd.org>



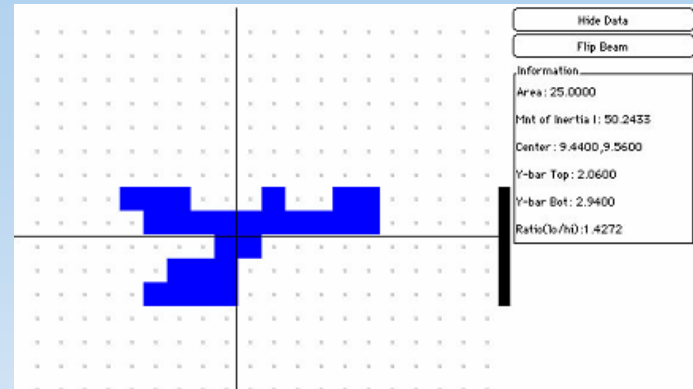
CSERD contains models and resources:



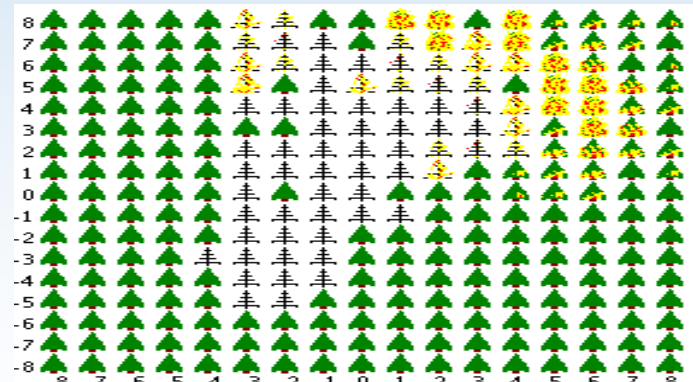
uses **real-life situations** to teach inquiry-based math and science concepts



uses **models** to demonstrate and visualize concepts

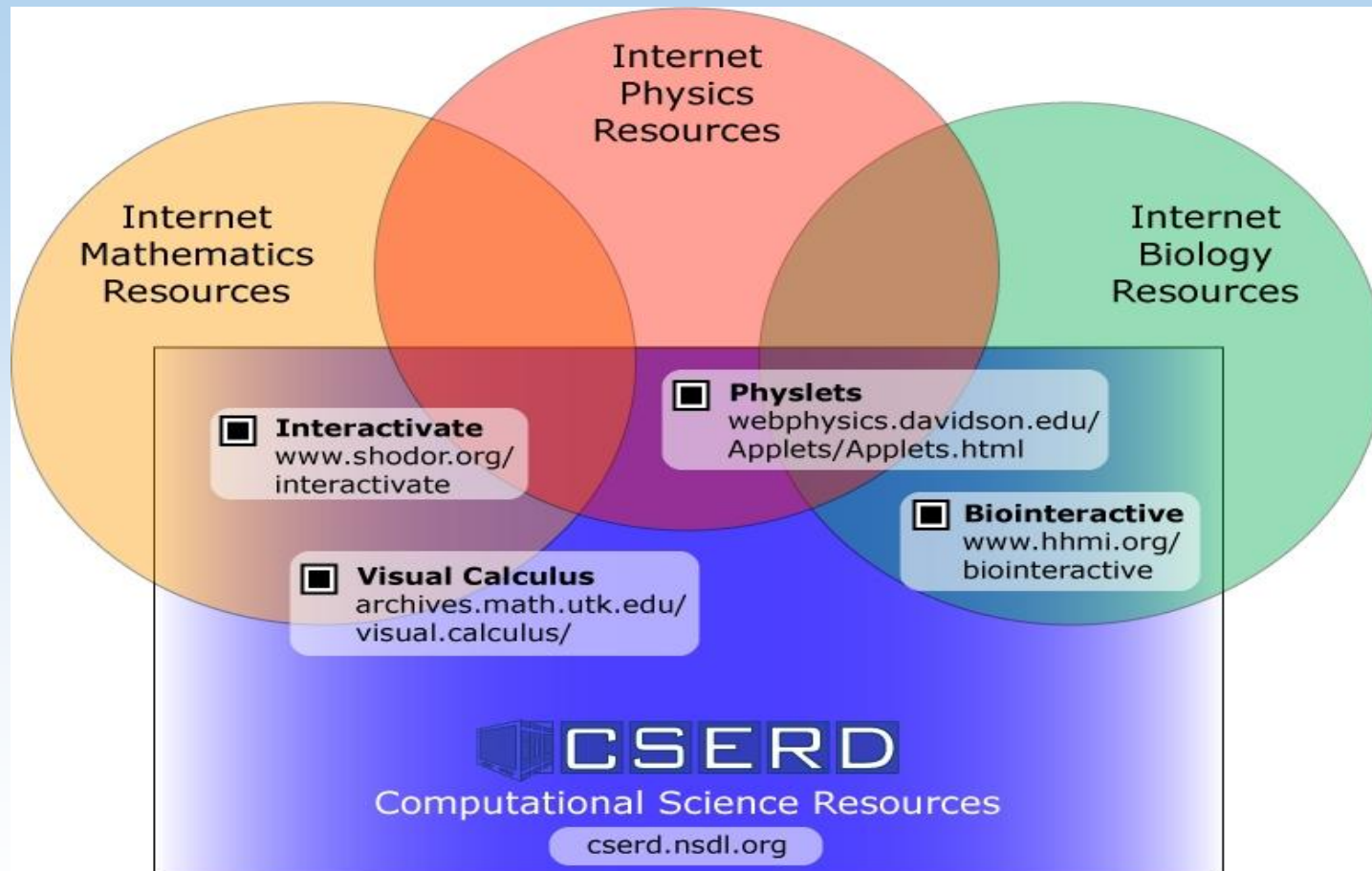


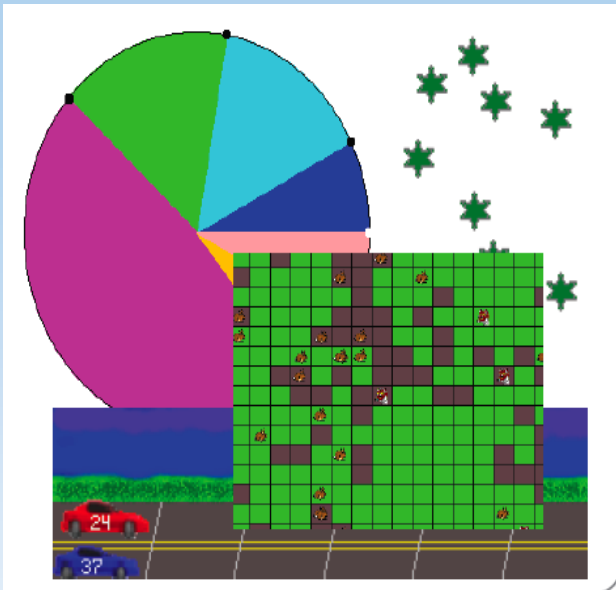
helps students learn how to **use technology** to **solve problems**



uses **interactive tools** to observe and analyze data

CSERD contains a catalog of educational resources across the internet and multiple disciplines





Resources Include:

- More than 100+ interactive activities
- Lesson plans
- Discussions
- Worksheets
- Open-ended explorations
- Dictionary
- Standards alignments
- Tools

✓ Browse:

By Subject (broad)

By Topic (specific)

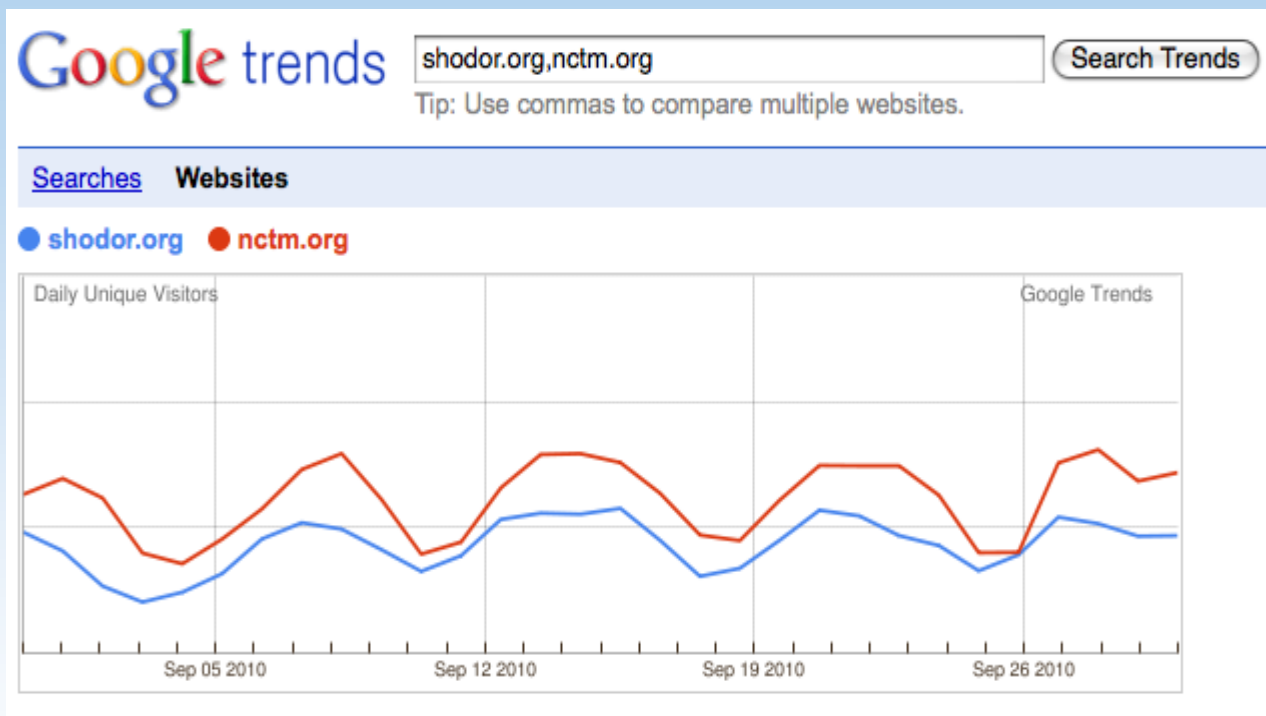
By Audience

By Resource Type

Search

Allows students and teachers to dynamically manipulate data and immediately see results take shape before their eyes.

Traffic to Shodor's website compares in trends and volume to that of the National Council of Teachers of Mathematics (NCTM).



*Shodor's award-winning online STEM resources receive **more than 3.5 million web page views per month!!** In March 2010, Shodor served **4.25 million web pages to 800,000 visitors!!***

Over the past year, CSERD has engaged key partners to increase its outreach and to leverage its computational science resources.

These Partnerships have enabled CSERD to build content communities

- National Computation Science Institute (NCSI)
- Blue Waters
- High Performance Computing (HPCU)
- High Performance Computing Opportunities HiPOP
- Journal of Computational Science Education (JOCSE)

National Computational Science Institute (NCSI)

- NCSI provides workshops covering a wide range of subjects relating to computational science. These workshops are for educators at all levels, giving them ideas and resources to use in their classrooms.
- National Science Digital Library (NSDL) in partnership with NCSI enabled us to get on the road more, offering more summer workshops last year and this coming summer, we have increased our outreach for NSDL in general and computational science through CSERD in particular.

(<http://computationalscience.org/>)



SHODOR



Blue Waters

Shodor has a national leadership role in teaching others to effectively harness the power of the world's largest computer.

Blue Waters is led by the University of Illinois and its National Center for Supercomputing Applications in partnership with IBM. Shodor will help educate the next generation of users of the world's first sustained "petascale" computational system dedicated to open scientific research.

- Shodor's leadership will serve to prepare the next generation of young scientists to use the new computing environment as they pursue careers in science, math, engineering and medicine. These students will work with Shodor scientists and educators to develop the new curriculum and computer models that will be used in classrooms across the U.S.

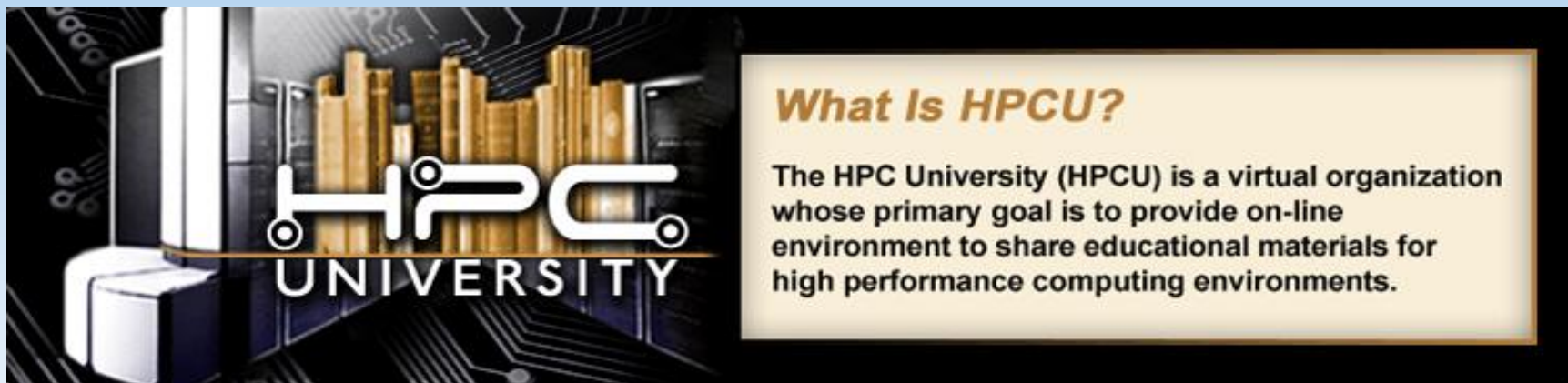
<http://www.ncsa.illinois.edu/BlueWaters/>



SHODOR



The High Performance Computing Community



<http://hpcuniversity.org>

As a sub-collection of the Computational Science Education Reference Desk (CSERD), the front page of HPCU displays a rotating set of featured resources from the CSERD catalog. Also, new resources that are submitted for inclusion in HPC University are automatically catalogued for CSERD.

HPCU actively seeks participation from all sectors of the HPC community to:

- assess the learning and workforce development needs and requirements of the community
- catalog, disseminate and promote peer-reviewed and persistent HPC resources
- develop new content to fill the gaps to address community needs
- broaden access by a larger and more diverse community via a variety of delivery methods
- and pursue other activities as needed to address community needs

What can you find at HPC University?

EDUCATORS

- Curriculum Development
- Fellowships
- HPC Competencies
- Awards
- HPCU Catalog

STUDENTS

- Challenge of the Week
- Competitions
- Internships & Fellowships
- Awards
- HPCU Catalog

HPC University Partners and Contributors

- Argonne National Laboratory
- Department of Energy
- Indiana University
- Krell Institute
- Lawrence Berkeley National Laboratory
- National Center for Supercomputing Applications
- National Energy Research Scientific Computing Center
- National Institute for Computational Sciences
- National Science Digital Library
- National Science Foundation
- Oak Ridge National Laboratory
- Ohio Supercomputer Center
- Open Science Grid
- Pittsburgh Supercomputing Center
- Purdue University
- San Diego Supercomputer Center
- Shodor Education Foundation, Inc.
- TeraGrid
- Texas Advanced Computing Center
- University of Chicago

HiPOP partners with Shodor and NCSA

- Building a Cyber-Platform for the Support of High Performance Computing Higher Education
- Provide easy access to information on educational and research issues in HPC/CS&T, with particular appeal to students
- Develop joint policies for designing an optimal strategy to create sufficient awareness among the youth on the growing importance of large-scale-simulations to modern society

HiPOP Consortium (hipop.cyi.ac.cy)

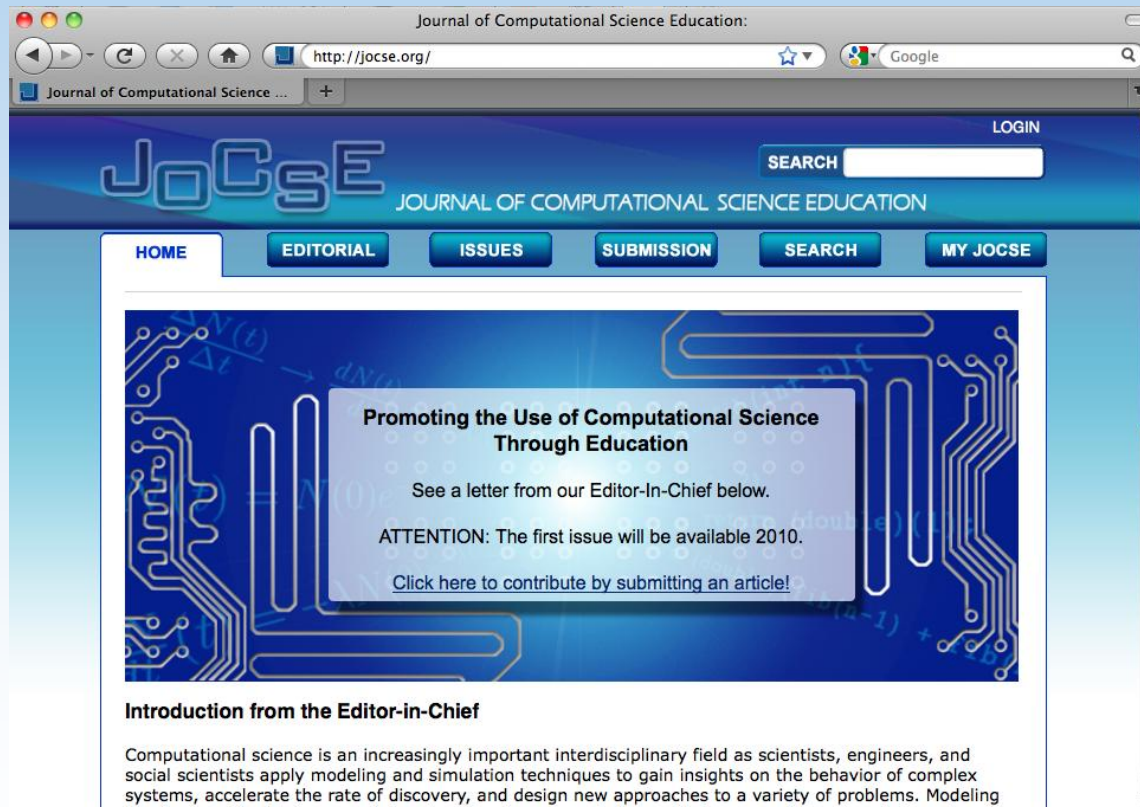
EU Institutions

- Cyprus Research and Educational Foundation – The Cyprus Institute
- German Research School for Simulation Sciences
- Bergische Universität Wuppertal
- Forschungszentrum Jülich – Jülich Supercomputing Centre

US Institutions

- National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign
- Shodor Foundation

The Journal of Computational Science Education



Journal of Computational Science Education:
http://jocse.org/

Journal of Computational Science ...

LOGIN

SEARCH

JOCSE
JOURNAL OF COMPUTATIONAL SCIENCE EDUCATION

HOME EDITORIAL ISSUES SUBMISSION SEARCH MY JOCSE

Promoting the Use of Computational Science Through Education

See a letter from our Editor-In-Chief below.

ATTENTION: The first issue will be available 2010.

[Click here to contribute by submitting an article!](#)

Introduction from the Editor-in-Chief

Computational science is an increasingly important interdisciplinary field as scientists, engineers, and social scientists apply modeling and simulation techniques to gain insights on the behavior of complex systems, accelerate the rate of discovery, and design new approaches to a variety of problems. Modeling has become the third corner of scientific education, along with theory and experimentation. As

An Interactive Publication (jocse.org)

- **ISSN 2153-4136 online**
- **Mission Statement:**

The Journal of Computational Science Education (JOCSE) promotes the use of computation in education through disseminating unique uses of computation in the classroom as well as research findings in computational science education, with submissions from both professionals and students. JOCSE utilizes internet technology and a web-based format to allow for enhanced interactivity in all publications.