

All About CACHE

Joe Golab, INEOS Technologies

Dave Kofke, U-Buffalo, State University of New York

Tom Edgar, UT-Austin

CACHE Corporation



Outline

- About CACHE
- Software
- Conferences
- Educational Materials
- Dissemination
- Awards
- Leadership
- Support of CACHE

About CACHE

- ❑ Computer Aids for Chemical Engineering
- ❑ Founded in 1969
- ❑ Mission
 - *To promote cooperation among universities, industry, and government in the development and distribution of computer-aided instructional aids for the chemical engineering profession*
- ❑ Current Board of Trustees – 28 members
 - *21 Academic; 7 Industrial or Government*

Wayne Bequette - Rensselaer Polytechnic Institute
Chau-Chyun Chen - Aspen Tech
Peter Cummings - Vanderbilt University
Michael Cutlip - University of Connecticut
James Davis - UCLA
Frank Doyle - University of California, Santa Barbara
Thomas Edgar - University of Texas at Austin
Mahmoud El-Halwagi - Texas A&M University
Scott Fogler - University of Michigan
Rafiqul Gani - Technical University of Denmark
Joseph Golab - INEOS Technologies
Michael Henson - Univ. of Massachusetts, Amherst
Robert Hesketh - Rowan University

Marianthi Ierapetritou - Rutgers University
Jason Keith - Michigan Technological University
David Kofke - State University of New York at Buffalo
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Warren Seider - University of Pennsylvania
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Gavin Towler - UOP
Phillip Westmoreland - North Carolina State University
Stephen Zitney - Natl. Energy Technology Laboratory
Concetta LaMarca - DuPont

Past Members

Rakesh Agrawal - Purdue University
Yaman Arkun - Georgia Tech
Lorenz Biegler - Carnegie Mellon University
Gary Blau - Dow Elanco / Purdue University
Joe Boston - Aspen Tech
Herb Britt - Aspen Tech
Peter Bullemer - Honeywell
Brice Carnahan - University of Michigan
James Christensen - University of Oklahoma
Jennifer (Sinclair) Curtis - University of Florida
Morton Denn - University of California, Berkeley
Michael Doherty - Univ. of California, Santa Barbara
James Douglas - Univ. of Massachusetts, Amherst
Eugene Elzy - Oregon State University
Lawrence Evans - Massachusetts Inst. of Technology
Bruce Finlayson - University of Washington
Grant Fisher - University of Alberta
Christodoulos Floudas - Princeton University
Rodney Fox - Iowa State University
Carlos Garcia - Shell
Edward Grens - University of California, Berkeley
Ignacio Grossmann - Carnegie Mellon University
John Hale - DuPont
Carol Hall - North Carolina State University
J. J. Haydel - Shell
Ernest Henley - University of Houston
David Himmelblau - University of Texas at Austin
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Richard Hughes - University of Wisconsin
Robert Jelinek - Syracuse
A. I. Johnson - University of Western Ontario
Jeffrey Kantor - University of Notre Dame
Ferhan Kayihan - Weyerhaeuser
Sangtae Kim - Lilly / University of Wisconsin
Ronald Klaus - University of Pennsylvania
Richard LaRoche - Fluent / DEM Solutions

Theodore Leininger - DuPont
Richard Mah - Northwestern University
Duncan Mellichamp - Univ. of California, Santa Barbara
James Michaels - Merck
Manfred Morari - California Institute of Technology
Rodolphe Motard - Washington University
Babatunde Ogunnaike - University of Delaware
Linda Petzold - University of California, Santa Barbara
Gary Powers - Massachusetts Institute of Technology
Fred Ramirez - University of Colorado
James Rawlings - University of Wisconsin
Norman Rawson - IBM
Matthew Reilly - Carnegie Mellon University
Irven Rinard - Halcon
Peter Rony - Virginia Tech
Edward Rosen - Monsanto / EMR Technology Group
Stanley Sandler - University of Delaware
William Schiesser - Lehigh University
J. D. Seader - University of Utah
John Seinfeld - California Institute of Technology
Paul Shannon - Dartmouth
Cecil Smith - Louisiana State University
David Smith - DuPont
Dennis Spriggs - Union Carbide
George Stephanopoulos - Massachusetts Inst. of Tech.
Ross Taylor - Clarkson University
Tyler Thompson - Dow Chemical
Louis Tichacek - Shell
James Tilton - DuPont
James Trainham - PPG Industries
Venkat Venkatasubramanian - Purdue University
Robert Weaver - Tulane University
Arthur Westerberg - Carnegie Mellon University
James White - Modular Mining Systems
Joseph Wright - Xerox
Imre Zwiebel - Worcester Polytech

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Welcome to CACHE

What is CACHE?

CACHE Trustees

Academic Affiliates

Industrial Affiliates

Awards

Himmelblau Award

Evans Award

CACHE Award

CACHE Products

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Products Page

Cachet / Faculty Openings

Conferences

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Career Sites

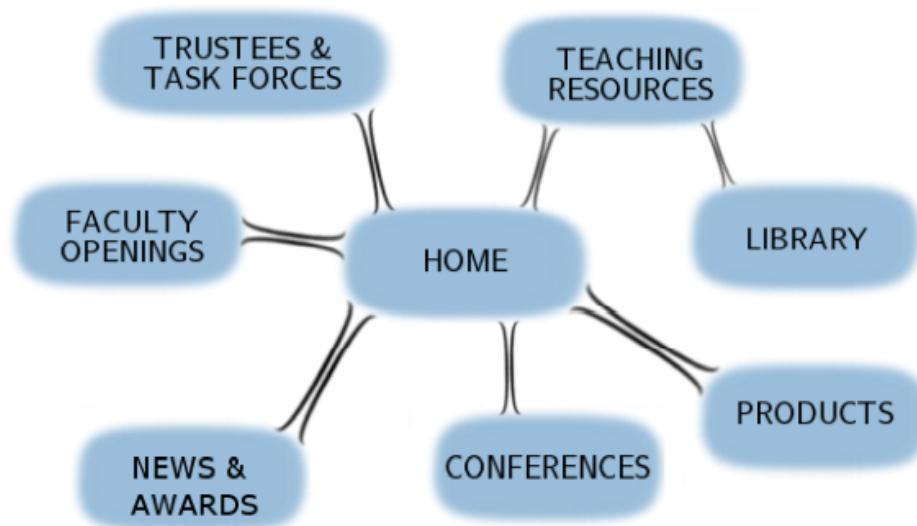
CACHE News

Teaching Resources

Contact Us

Welcome to CACHE

CACHE is a not-for-profit organization founded in 1969 to promote cooperation among universities, industry and government in the development and distribution of computer-related educational aids for the chemical engineering profession. [More...](#)



☒ only search CACHE

– Current Events –

**Accepting Nominations
for CAST Division
Awards**

**Chemical Engineering
Faculty Openings**

**Michael E. Hanyak, Jr.
Receives 2011 ASEE-
CACHE Award**

**Biographical Profiles of
Faculty Candidates**

**Doyle, Gatzke, and
Parker win CAST
Himmelblau award**

**Winter 2012
Newsletter**

**Fuel Cell Curriculum
Project Website**

**2012 ASEE Summer
School Information**

**News Article on CACHE
Guide to Teaching
Design**

□ What does CACHE do?

Software

- ❑ CACHE was founded to address the need to bring academic process modeling software to the curriculum
 - *FLOWTRAN – Monsanto product that CACHE acquired on behalf of universities*
 - *ChemSep*
 - ❑ User-friendly separation package
 - ❑ Develop by Ross Taylor and collaborators
 - *Polymath*
- ❑ Student APP competition

Polymath

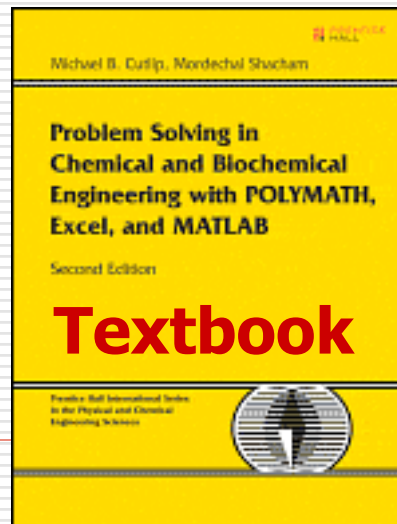
- ❑ Numerical analysis software specifically for educational use
 - Linear, nonlinear equations, differential equations, data analysis and regression
 - New development: integration of selected physical property data from DIPPR database (AIChE)
- ❑ Packaged with several leading ChE textbooks
- ❑ Discounted licenses for CACHE affiliates
 - Licensed by almost 120 departments worldwide

Authors:

Mike Cutlip

Mordechai Shacham

Mike Elly



```
CB0=1
d(x)/d(t)=
del1=-10000
logP=a+b
(C=C)
```

www.polymath-software.com

NEW AFFORDABLE PURCHASE OPTIONS for Educational Version (Students only)

POLYMATH 6.1 - for Windows XP, Vista and Win7

POLYMATH is a proven computational system that has been specifically created for educational or professional use. The various POLYMATH programs allow the user to apply effective numerical analysis techniques during interactive problem solving on personal computers. Results are presented graphically for easy understanding and for incorporation into papers and reports. Engineers, mathematicians, scientists, students, or anyone with a need to solve problems will appreciate the efficiency and speed of problem solution.

POLYMATH utilizes a color-coded full-screen editor. All displays have been optimized for user efficiency. Also provided with Polymath 6.1 is the UNIQUE capability to automatically export any POLYMATH problem to Excel with a single keypress. Thus problems can be solved completely in Polymath or exported to Excel™ for solution. A POLYMATH ODE_Solver Add-In is included for solving ordinary differential equations in Excel. Automatic export to Excel includes all intrinsic functions and logical variables. Ordered equations can also be provided to assist with optional Matlab™ solutions of POLYMATH problems.

The **Professional Version** problem-solving capabilities include:

- Linear Equations - up to 264 simultaneous equations
- Nonlinear Equations - up to 300 simultaneous nonlinear and 300 additional explicit algebraic equations
- Differential Equations - up to 300 simultaneous ordinary differential and 300 additional explicit algebraic equations
- Data analysis and Regression - up to 200 variables with up to 1000 data points for each, with capabilities for linear, multiple linear, and nonlinear regressions with extensive statistics plus polynomial and spline fitting with interpolation and graphing capabilities

The **Educational Version** has more limited problem sizes that can be solved and is only available for students. [Details](#)

[Overview of Polymath 6.1](#)

POLYMATH 6.1 Trial/Purchase Options

POLYMATH Software
[home | overview | order | manuals | support | demos]



Mobile Device App Competition

Quick Links

- Undergraduate student teams will create an APP for a mobile device that is useful for an AIChE member. The APP must run on a mobile device such as a smartphone. Student teams can consist of any discipline, but at least half of the team must be members of AIChE.
- Two Awards
 - \$500 from CACHE for the first place winner of the best mobile device APP
 - \$500 from a corporate sponsor for the best mobile device A that addresses safety
- Presentation
 - The competition at the AIChE annual meeting will consist of a poster competition where finalists will be selected to give a short presentation to a general audience at the conference in San Francisco
- **More information:**
 - <http://www.aiche.org/community/awards/mobile-device-app-competition>
 - Email: hesketh@rowan.edu
- The Competition Committee: Chau-Chyun Chen, Scott Fogler, Robert Hesketh, Jason Keith, Concetta LaMarca

Conferences

- CPC
 - *Chemical Process Control*
 - *Since 1976*
- FOCAPD
 - *Foundations of Computer-Aided Process Design*
 - *Since 1983*
- FOCAPO
 - *Foundations of Computer-Aided Process Operations*
 - *Since 1987*
- FOMMS
 - *Foundations of Molecular Modeling and Simulation*
 - *Since 2000*
- FOSBE
 - *Foundations of Systems Biology and Engineering*
 - *Since 2005*
- Each conference held every 2-5 years

Conferences

- On average, 1-2 held every year
- Financed by registration fees, federal grants, corporate sponsors
- Recent conferences
 - FOCAPO/CPC
 - New synthesis
 - FOMMS 2012
 - FOSBE 2012 (Japan)

Home Abstracts Contact Email Fellowships FOMMS Medal History Key Dates Photos Schedule Speakers Venue

FOMMS 2012 Foundations for Discovery and Data

Chair: Edward Maginn (Notre Dame)

Co-Chairs: Ilya Siepmann (Minnesota) and Kristen Fichthorn (Penn State)

Senior Advisors: Peter Cummings (Vanderbilt), Joe Golab (INEOS), Sharon Glotzer (Michigan), and Clare McCabe

The FOMMS 2012 Conference will be held July 22-26, 2012 at The Resort at The Mountain, nestled in the western highlands of Mt. Hood less than an hour southeast of Portland, Oregon, USA. In addition to outstanding lectures and discussion on a range of topics in molecular modeling and simulation, the conference will include mini-workshops, organized outings, and the FOMMS Medal banquet.

Search
Search this site:

Access the call for abstracts here: [LINK](#)

Graduate student and post-doc fellowships: [LINK](#)

Access a poster that you can print out and post here:

Overview

Access the call for abstracts here: [LINK](#)

FOMMS 2012 is the 5th international conference showcasing applications and theory of computational quantum chemistry, molecular science, and engineering simulation. It is motivated by the continual need for

FOCAPO 2012

8 - 11 January 2012
Foundations of Computer-Aided Process Operations
The Westin Savannah Harbor Golf Resort & Spa
Savannah, Georgia USA



TSURUOKA, JAPAN
OCTOBER 21-25

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EVENT COUNTDOWN

29 17 9 2
Days Hours Minutes Seconds

(FOSBE-2012) abstract submission deadline

In association with:
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Funds from:
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[Tsuruoka City](#)
[Inoue-Zaidan Foundation](#)

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Nishikawa Keisaku

FOSBE 2012 HomePage

Introduction

Monday, 19 December 2011 03:54 administrator

About FOSBE

We cordially invite you to Foundations of Systems Biology in Engineering (FOSBE) to be held in Tsuruoka, north-west Japan, October 21st-25th, 2012. FOSBE is an international conference that addresses emerging challenges and opportunities in systems biology with a particular emphasis on engineering approaches and applications. The primary objectives of FOSBE are to provide an in-depth review and critical assessment of the current state-of-the-art, to discuss current and future needs of research, education and training, and to identify new directions in systems biology. The overseeing body [Computer Aids in Chemical Engineering](#) (CACHE) was founded in 1969 to promote computational skills in academic, government and industrial chemical engineering and is currently supported by around 140 academic institutes worldwide. FOSBE was originally scheduled for October 2011 we postponed the conference due to the Earthquake and Tsunami in North-East Japan. As Tsuruoka is in North-West Japan the effects of the disaster were minimal.

We hope you can come to Tsuruoka for our exciting conference, experience [Shonan culture](#) and play a part in regenerating the Tohoku region.

Conference Venue

The Institute for Advanced Biosciences, Keio University, is an academic research institute pioneering the new life science field of "Systems Biology", using both experimental and computational biology. There are several groups working in collaboration, focusing mainly on genome biology and engineering, genome design and synthetic biology, metabolic engineering

Educational Materials

□ Past

- *Purdue Process Design Modules*
- *Michigan Interactive Modules*

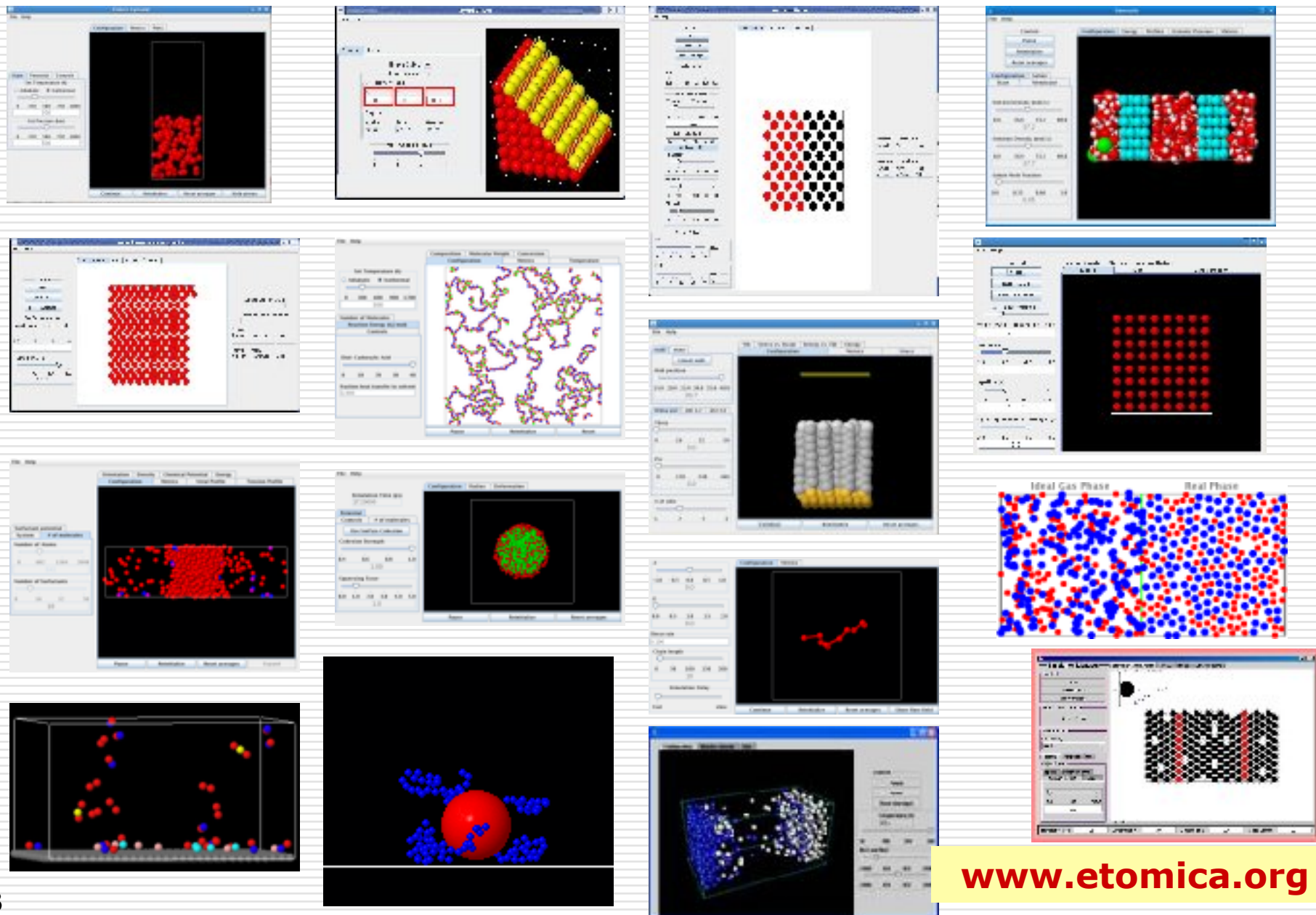
□ Ongoing

- *Chemical engineering process design case studies*
 - *Two new case studies developed for biofuels*
- *Etomica molecular simulation modules*

□ Planned for development

- *AIChE student design contest solutions on the web*
- *Document other contributions from faculty teaching design*
- *Sustainable manufacturing case studies (NSF grant)*

Molecular Simulation Modules



Dissemination

- CACHE addresses issues related to the communication of information
 - Website, newsletters, reports, conference proceedings, and computer programs
- ASEE Summer School materials
- CACHE News
 - Latest biannual edition released one month ago – email sent to department chairs
 - Please bring new releases to the attention of your faculty
- CACHE Teaching Resource Center
 - Guide to teaching design with internet links
- cachet academic jobs posting site
 - Academic affiliates can post openings at no charge
 - Any faculty candidate can post a profile, at no charge

cachet



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Sort by Filter by

	Department	Target rank	Posting Date App Deadline	Preferred Research Areas
	Chemical Engineering Louisiana State University	Asst. Prof., Assoc. Prof., Prof.	Oct 17, 2011 none	Environment/sustainability, Energy
	Chemical and Biochemical Engineering Rutgers University	Asst. Prof., Assoc. Prof., Prof.	Oct 17, 2011 none	Reaction engineering, Bioengineering, Process engineering, Energy, Separations, Manufacturing/logistics
	Chemical Engineering University of Toledo	Asst. Prof., Assoc. Prof., Prof.	Oct 15, 2011 none	Environment/sustainability, Energy
	Chemical and Biomolecular Engineering University of Pennsylvania	Asst. Prof., Assoc. Prof., Prof.	Oct 11, 2011 none	unrestricted
	Department of Chemical Engineering Auburn University	Asst. Prof., Assoc. Prof., Prof.	Oct 11, 2011 none	Bioengineering
	Chemical and Biological Engineering University at Buffalo (SUNY)	Asst. Prof., Assoc. Prof.	Oct 10, 2011 Dec 1, 2011 Oct 6, 2011	Materials, Thermo/stat-mech, Modeling/simulation, Nanotechnology, Energy



Sort by research area



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Sort by **Research Area**

- ☐ Materials
☒ Thermo/stat-mech
☐ Process engineering
☐ Transport phenomena
☐ Manufacturing/logistics

Filter by **Target Rank**

- ☐ Reaction engineering
☐ Modeling/simulation
☐ Dynamics/control
☒ Energy
☐ Education

Location

- ☐ Bioengineering
☐ Environment/sustainability
☐ Nanotechnology
☐ Separations

	Department	Target rank	Posting Date App Deadline	Preferred Research Areas
	Chemical Engineering University of New Hampshire	Asst. Prof.	Aug 19, 2011 Dec 1, 2011	Energy
	The Gene and Linda Voiland School of Chemical Engineering and Bioengineering Washington State University	Asst. Prof.	Mar 14, 2011 none	Energy
	Chemical and Biological Engineering University at Buffalo (SUNY)	Asst. Prof., Assoc. Prof.	Oct 10, 2011 Dec 1, 2011	Materials, Thermo/stat-mech, Modeling/simulation, Nanotechnology, Energy
	Chemical Engineering Louisiana State University	Asst. Prof., Assoc. Prof., Prof.	Oct 17, 2011 none Oct 15, 2011	Environment/sustainability, Energy



Filter by Location



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☒ USA
☒ Filter by state



☐ AK ☐ AL ☐ AR ☐ AZ ☐ CA ☐ CO ☒ CT ☒ DE ☐ FL ☐ GA
☐ HI ☐ IA ☐ ID ☐ IL ☐ IN ☐ KS ☐ KY ☐ LA ☒ MA ☐ MD
☒ ME ☐ MI ☐ MN ☐ MO ☐ MS ☐ MT ☐ NC ☐ ND ☐ NE ☒ NH
☒ NJ ☐ NM ☐ NV ☒ NY ☐ OH ☐ OK ☐ OR ☒ PA ☒ RI ☐ SC
☐ SD ☐ TN ☐ TX ☐ UT ☐ VA ☒ VT ☐ WA ☐ WI ☐ WV ☐ WY

☐ Singapore

	Department	Target rank	Posting Date App Deadline	Preferred Research Areas
	Chemical Engineering University of New Hampshire	Asst. Prof.	Aug 19, 2011 Dec 1, 2011	Energy
	Chemical and Biological Engineering University at Buffalo (SUNY)	Asst. Prof., Assoc. Prof.	Oct 10, 2011 Dec 1, 2011	Materials, Thermo/stat-mech, Modeling/simulation, Nanotechnology, Energy
	Chemical and Biological Engineering Drexel University	Asst. Prof., Assoc. Prof., Prof.	Jul 8, 2011 none	Materials, Reaction engineering, Bioengineering, Thermo/stat-mech, Modeling/simulation, Environment/sustainability, Process engineering, Dynamics/control, Nanotechnology, Transport phenomena, Energy, Separations
	Chemical and Biomolecular Engineering University of Pennsylvania	Asst. Prof., Assoc. Prof., Prof.	Oct 11, 2011 none	unrestricted



A Faculty Ad



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Institution: University of New Hampshire
Department: Chemical Engineering
Location: Durham, New Hampshire
Target rank: Assistant Professor
Tenure track: yes
Start date: Fall 2012
Posting date: August 19, 2011
Application deadline: December 1, 2011
More info URL: <http://www.unh.edu/chemical-engineering>
Contact: Nancy Brady Severn
nbl@cjsunix.unh.edu
603 862 3654
Research areas: Energy

[Posting PDF](#)

The department of chemical engineering invites applications for a tenure-track assistant professor positions beginning in August 2012. The search will continue until the position is filled. The successful candidate is expected to have strong commitment to develop an active research program and excellence in teaching at both undergraduate and graduate levels. Candidates are required to have an undergraduate degree in chemical engineering and a Ph.D. degree in chemical engineering. Candidates with experience and interest in the area of sustainable energy are especially encouraged to apply. Please send applications with curriculum vitae, a description of teaching and research interests and experiences and names and addresses of three references to: Chair, Search Committee, Department of Chemical Engineering, Kingsbury Hall, University of New Hampshire, Durham, New Hampshire 03824. The University seeks excellence through diversity among its administrators, faculty, staff, and students. The University of New Hampshire is an Equal Opportunity, Affirmative Action Employer. Application by members of all underrepresented groups is encouraged.



Candidate List

Logged in as buffalo [\[log out\]](#)


c a c h e t
Academic jobs for chemical engineers
 A service of CACHE

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☐ Materials

☐ Reaction engineering

☐ Bioengineering

☒ Thermo/stat-mech

☐ Modeling/simulation

☐ Environment/sustainability

☐ Process engineering

☐ Dynamics/control

☐ Nanotechnology

☐ Transport phenomena

☐ Energy

☐ Separations

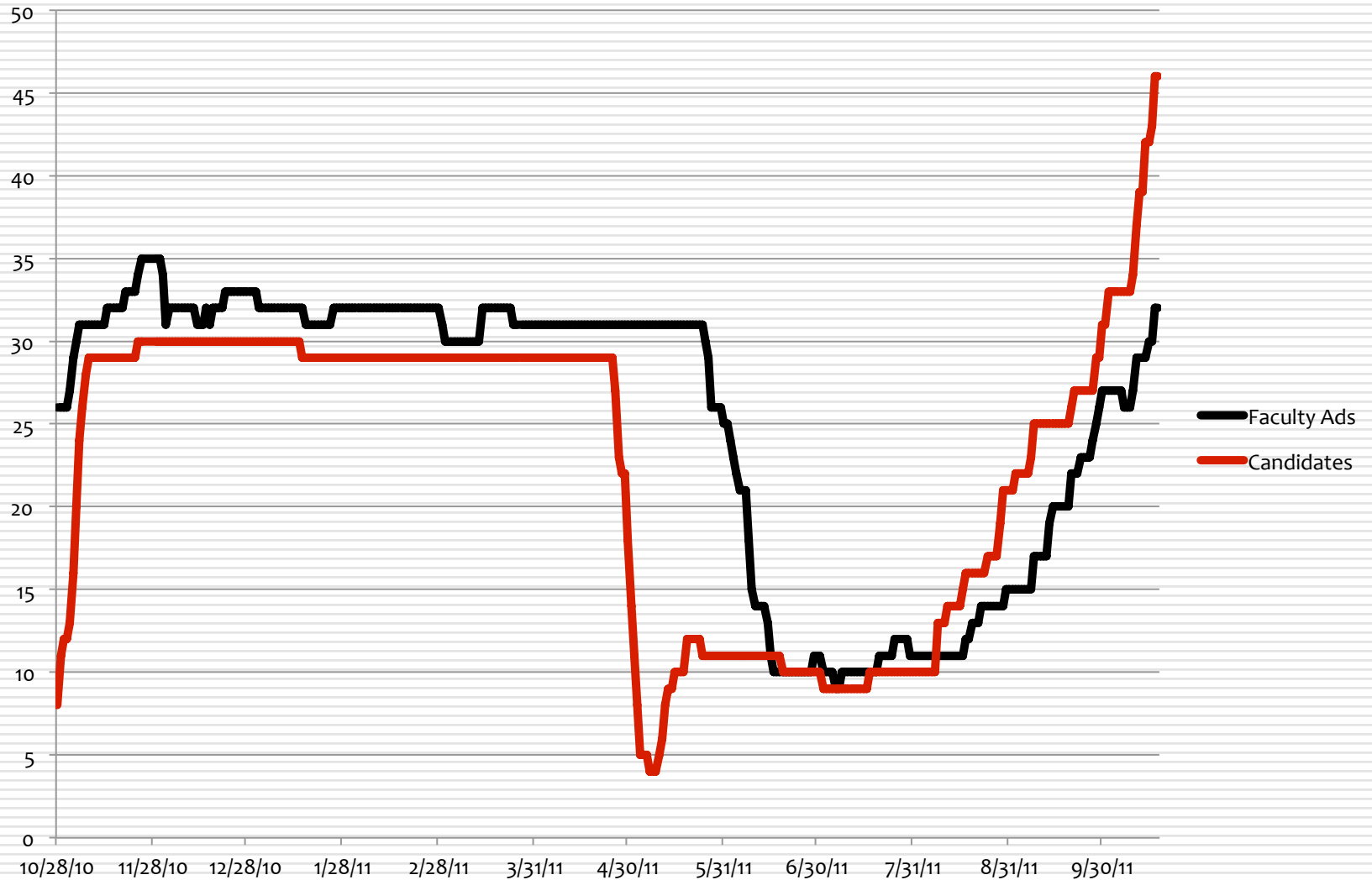
☐ Manufacturing/logistics

☐ Education

Research interests	
Molecular Modeling and Computations; Theoretical, and Biophysical Chemistry; Protein Folding; Allosteric transitions; Protein Aggregation.	Report as inappropriate
Molecular Simulations, Neutron Scattering, Protein-Protein Interactions, Membrane Biophysics, Drug-Delivery (Liposomes), Receptor cluster dynamics	Report as inappropriate
The interdependence of biochemical and mechanical processes in morphogenesis, particularly in systems featuring fluid flow.	Report as inappropriate

Can also generate list and location of candidate oral presentations

cachet Usage



Awards

❑ CACHE/ASEE Award

- *Administered by ASEE*
- *For significant contributions in the development of computer aids for chemical engineering education*

❑ AIChE-CAST/CACHE Himmelblau Award

- *Administered by AIChE CAST division*
- *Recognizes contribution to computer-based chemical engineering education made within the past decade*
- *Successful endowment campaign led by CACHE recently completed*

❑ AIChE Evans Award

- *Institute-level award of AIChE*
- *Recognizes lifetime achievement in chemical engineering practice*
- *Successfully endowed at \$100K via campaign led by CACHE*

❑ Please help with nominations each year!

Leadership – Task Forces

- ❑ Awards
- ❑ Biosystems
- ❑ Case studies
- ❑ Conferences
- ❑ Energy
- ❑ Learning Resources
- ❑ Molecular Modeling
- ❑ Smart/Sustainable Manufacturing
 - *new NSF grant on establishing a research coordination network*
- ❑ Software engineering
- ❑ Website

CACHE Operations

- Trustees meet as a group twice annually
 - *Piggyback on other meetings to save travel costs*
 - *Trustees serve as volunteers*
- Executive Committee conference calls monthly
- Half-time secretary
- Accountant

CACHE Resources

□ Expenses

- *Awards and prizes, task force activities, trustee meetings, office operations, software development*

□ Income

- *Conferences*
- *Grants*
- *Software sales and licenses*
- *Affiliates*
 - \$200/year for membership
 - 105 affiliates in US, 28 in other countries (133 total)

Summary

□ CACHE does a lot for the ChE community

- *Software*
- *Conferences*
- *Educational Materials*
- *Dissemination*
- *Awards*
- *Leadership*