Annual Report

Department of Chemical & Biomolecular Engineering

North Carolina State University

Academic Year 2007-2008
Dear CBE Community and Friends,

I am pleased to provide the 2007-2008 Annual Report for the Department of Chemical and Biomolecular Engineering at NC State University. Here, you will find a summary of our Department’s accomplishments including statistics on the undergraduate and graduate programs, faculty scholarly publications and presentations, research productivity, sponsors who supported the research, awards and honors received by our faculty, and a compilation of the staff and visitors to the Department. We had a productive year, and it is in large part based upon the dedication and work of all (students, staff, and faculty). I invite you to peruse the document for the standard measures that these reports provide, but I also hope that you review the Report with an eye towards the people who are involved --- these folks enable the Department’s success.

Sincerely,

Peter S. Fedkiw
Professor and Head
Department of Chemical and Biomolecular Engineering
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Undergraduate Program

Trends in Undergraduate Enrollment

Academic Year

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>No. students matriculated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>200</td>
</tr>
<tr>
<td>1995</td>
<td>300</td>
</tr>
<tr>
<td>2000</td>
<td>400</td>
</tr>
<tr>
<td>2005</td>
<td>500</td>
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Trends in B.S. Degrees Granted

Academic Year

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>0</td>
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<tr>
<td>2000</td>
<td>40</td>
</tr>
<tr>
<td>2005</td>
<td>60</td>
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</table>
B.S. Degree Recipients

Summer 2007 graduates:
Gabriel James Anderson
William Christopher Lowe
Brian Lee Mills
Hunter Caldwell Morris
Lauren Elizabeth Spencer *
Michael Francis Vergamini

December 2007 graduates:
Brandon Phillip Boyd
Matthew Scott Brady
Brett Taylor Calcutt
Heather Michelle Carroll
Charles Grant Culbertson
Bradley Allen Cunningham
Wesley Eric Diamaduros
Troy Donald Gould
Valerie Renee Hoffman
Thomas Haywood Medlin III
Aleta Hope Metzler *
Joseph Monroe Rawls
Steven Chris Saunders Jr
Jerome Joseph Savage II
Graham Thomas White
May 2008 graduates:

Ahmed Abdel-Rahman*  
Michael John Akerman1***  
Lulwa Mohammed Alborno  
Rachel Anne Babson1***  
Willie James Barton, Jr.**  
Joshua Michael Beatty*  
Emily Lauren Blackwell  
Laura Elizabeth Blackwell**  
Vanessa Marie Blaylock  
Kevin Bennett Brown  
Bessie Ellen Bryant  
Robert Winston Crews, Jr.*  
Devin Aldridge Cribb1  
Lauren Blair Crumpler*  
Eli Dashell Dawson  
Truong Dang Quang Dong1  
Graham Ross Gibson*  
Jennifer Kamar Gilliam*  
Stephanie Lane Goss*  
Daniel Gerard Harpham*  
Derek Scott Hernandez***  
Eric Xenos Hodgden  
Emily Wing-Kwong Hon1**  
Rebekah Elizabeth Howes**  
Patrick James Johnson**  
Dionne Wanja Kimani1*  
Halid Kopanski***  
Henry Tentzi Lan  
Derrick Lee Laton*  
Charles Marc Leyrer**  
Kendall Ruth Liner***  
Abigail Kay Lithgo***  
Brandon Celso Locklear***  
John Taylor Loftis*  

Matthew Curtis Markland1  
Patrick Michael McNeely***  
Wran Michael Metzler*  
Renee Elizabeth Mitchell***  
Dmitri Dmitrievich Moundous*  
Akinwale Omotayo Omofoyè*  
Michael David Perkins  
Kevin Matthew Porch  
Gabrielle Elaine Raymond  
Erin Leigh Redmond**  
Christie LeeAnn Reynolds  
Yorke Julianna Reynolds*  
Lindsey Eason Robinson***  
Liam Anthony Royce1*  
Heather Ann Ruby***  
Tracy Lee Sapp  
William Johnson Scarboro1  
Mohamed Abdelfattah Seyam**  
Christopher Allen Smith  
Justin William Smith1***  
Siddhartha Subramanian*  
Jose Melendres Tan, II**  
Chadwick Foster Thompson1  
Sarah Marie Trexler**  
Clifford Tsun-Ho Tse**  
Diana Kristen Tysinger*  
Ryan Michael VanGundy  
Elizabeth Bryant Vara  
Cindy Wang  
Erika Leigh White  
Schuyler Frewen Wilson*  
James Marshall Wright  
Robert Clayton Duclos Wright***  
Stephen Bryan Wright  

1 Double Major
* Cum Laude
** Magna Cum Laude
*** Summa Cum Laude

Statistics

B.S. degrees awarded 89
Double majors 21
Degrees with academic distinction 51
Scholarships and Honors — 2007-2008

Senior Alumni Loyalty Scholarship
  Kevin B. Brown
  Lauren B. Crumpler

Beckman Scholarship
  Jessica L. Lisane

Delta Gamma Foundation Scholarship
  Abigail K. Lithgo

Dean’s Merit Scholarship
  Patrick J. Johnson
  Heather A. Ruby

Eastman Scholarship
  Patrick M. McNeely

Engineering Alumni Scholarship
  Rebekah E. Howes

Engineering Senior Award for Humanities
  Yorke J. Reynolds

Engineering Senior Award for Leadership
  Clifford T. Tse

Engineering Senior Award for Scholarly Achievement
  R. Clayton Wright

Engineering Senior Award for Service and Citizenship
  Jessica L. Lisane

ExxonMobil Technical Scholarship
  Brandon C. Locklear

Forest O. and Sandra Mixon BS&T Scholarship
  Michael J. Akerman

Golden Chain Society
  Lindsey E. Robinson

Henry and Nancy Thomas Scholarship
  Jose M. Tan

Henry B. and Virginia Smith Scholarship
  Patrick J. Johnson

IKON Scholarship
  Rebekah E. Howes

Jackson Scholarship
  Halid Kopanski

Michael B. Christie Scholarship
  Brandon C. Locklear

National Starch
  Patrick M. McNeely

Park Scholarship
  Abigail K. Lithgo
  Lindsey E. Robinson
  Christopher A. Smith

Robert M. Barefoot Scholarship
  Derek S. Hernandez

Robert Byrd Scholarship
  Lauren B. Crumpler
  Patrick J. Johnson

Robin Barker Jones Scholarship
  Rebekah E. Howes

Russ O’Dell Senior Award
  R. Clayton Wright

S. Frank and Doris Culberson Scholarship
  Heather A. Ruby
Shell Oil Technical Scholarship
    Lauren B. Crumpler

State Employees Combined Campaign
Scholarship
    Mohamed A. Seyam
Student Organizations and Recognition

AIChe Student Chapter

Officers 2007-2008
President: Mohamed Seyam
Vice-President: Jenn Gilliam
Treasurer: Courtney Fox
Recording Secretary: Emily Hon
Corresponding Secretary: Cliff Tse
Chapter Advisor: Dr. Russ O’Dell

Activities
- Membership of 150 students.
- 34 company sponsored luncheons / dinners, Fall and Spring semester.
- 2 tours, one with AIChe Eastern NC Section
- 10 other meetings / student activities
- 21 students attended the National AIChe Student Chapter Conference in Salt Lake City, UT (November 2007)
- 20 students attended the Southern Regional Student Chapter Conference in Auburn, AL (April 2007).
- 2 students competed in the Southern Regional Student Chapter Conference Paper Competition
- Won bid to host 2010 Southern Regional Student Chapter Conference at NC State
- Maintained a website for easy access to information
- Community Service Projects: Service Raleigh, Habitat for Humanity Tutoring, Stop Hunger Now, Blood Drive, Bone Marrow Drive, Cards for Troops

ISPE Student Chapter

Officers 2007-2008
President: Chad Thompson
Vice-President: Lauren Crumpler
Secretary: Kimberly Shearer
Treasurer: Renee Mitchell
Dir. of Student Diversity: Derrick Laton
Dir. of Undergrad Affairs: Nicole Seabrook
Chapter Advisor: Marcelo Anderson

Industry Advisors
Joel Youngblood, Shannon Manning, Lisa Saxon, Eric Hickman

AIChe Activities
- Membership – 51 students
- Hosted 7 invited industry professionals to speak to chapter
- Hosted 3 academic program representatives to speak to chapter
- Sponsored two career workshops to assistant in job hunting
- Sponsored 2 programs on industry benefits
- Jointly hosted program with AIChe
- Supported COE and CALS Career Fairs at NC State University as well as the BTEC Open house and the ICC internship fair.
- Group hosted multiple social networking events with industry professional.

Chemical Engineering Honors Society
(Beta Omicron Chapter of Omega Chi Epsilon)

Officers 2007-2008
President: Garrett Swindlehurst
Vice-President: Robert Bradley
Treasurer: Justin Wood
Chapter Advisor (Pro-Temp): Dr. Robert M. Kelly

Activities
- Annual Induction ceremony and social
- Graduate School Info Session
Cooperative Education Program

A sound curriculum that combines theoretical and practical training in chemical engineering principles and design coupled with professional work experience is the basis of NC State’s Cooperative Education Program. The Cooperative Education Program at NC State provides outstanding undergraduates with terms of full-time study interspersed with up to five semesters and summer sessions of full-time engineering-related employment.

During the past year, 40 chemical engineering majors participated in the Co-op program. The students are full-time employees of the sponsoring company during their terms of work. During 2007-2008, the average monthly salary for Co-op chemical engineers during their first work rotation was $2,835. A high percentage of Co-op students receive offers of professional employment after graduation. Approximately 350 employers in North Carolina and throughout the nation participate in the Co-op program, thus providing a good cross-section of opportunities for industrial experience.

1. JOSHUA MICHAEL BEATTY   HONEYWELL – RICHMOND, VA
2. LEIGH-ANN MARIE BENDER   O’BRIEN AND GERE ENGINEERS – RALEIGH, NC
3. TOBIAS JAMES BLACKBURN   BIOGEN - RTP
4. LAURA ELIZABETH BLACKWELL   GLAXO SMITH KLINE - RTP
5. ANDREW SCOTT BOULTON   HONEYWELL – RICHMOND, VA
6. PAUL GASTON BOUZIGARD   EASTMAN CHEM. COMPANY – KINGSPO, TN
7. JESSICA ILENE BRANTLEY   HERSEY - HERSEY, PA
8. DAVID BENJAMIN DONALLEY   CLOSURE MEDICAL - RALEIGH, NC
9. SAMUEL FIPPS   PACKAGING CORP OF AMERICA – COUNC, TN
10. DANE ASHTON GRISMER   HERCULES – WILMINGTON, DE
11. ANDREW PARKER HEDGPEITH   DUPONT – RICHMOND, VA
12. ANDRESSA VERNALHA HUNGRIA   HERSEY - HERSEY, PA
13. ALEXANDER B HUNT   PCS PHOSPHATE
14. OWEN PATRICK JACOBS   EASTMAN CHEM. COMPANY - KINGSPO, TN
15. NICHOLAS PARKS KING   EXXON MOBIL – BAYTOWN, TX
16. EMMA C. KLAUS   GENERAL ELECTRIC – GREENVILLE, SC
17. MATTHEW STEPHEN KOLLMAN   GEORGIA PACIFIC – BIG ISLAND, VA
18. HALID KOPANSKI   DUPONT – RICHMOND, VA
19. HENRY TENTZI LAN   NATIONAL GYPSUM - CHARLOTTE, NC
20. ADAM BARTON LEEDY   NAT'L STARCH & CHEMICAL – SALISBURY, NC
21. MATTHEW CURTIS MARKLAND   NAT'L STARCH & CHEMICAL – SALISBURY, NC
22. DANIEL WILLIAM MCILMOYLE   ROBERT E MASON – CHARLOTTE, NC
23. NATHAN MOORE   PACKAGING CORP OF AMERICA - GA
24. KEVIN DAVID NANCE   HONEYWELL - RICHMOND, VA
25. NATALIE GWEN PATTERSON   NATIONAL GYPSUM – CHARLOTTE, NC
26. SARA J PERRIN   INVISTA, INC – WILMINGTON, NC
27. GENEVIEVE PIKE   NATIONAL GYPSUM – CHARLOTTE, NC
28. AUTUMN RACHEL PLACE   SOUTHERN COMPANY – AUGUSTA, GA
29. JEFFREY GORDON POLEY   PHILIP MORRIS – RICHMOND, VA
30. JEFFERY BYRAN HILL PREECE   EXXON MOBILE – BAYWATER, TX
31. NICOLE MARIE SEABROOK   BIOGEN IDEC – RTP
32. MICHAEL BRANDON SHANNONHOUSE   PACKAGING CORP. OF AMERICA – COUNCE, TN
33. ALEXANDER JAMES SMERASKI   MEAD WESTVACO – CHARLESTON, SC
34. JONATHAN LEE SOKASH   DUPONT – RICHMOND, VA
35. LAUREN ELIZABETH STANULIS   EASTMAN CHEM. COMPANY – KINGSPO, TN
36. CLIFFORD TSUN-HO TSE   GENERAL ELECTRIC - NH
37. PETER C VENEMA   DUPONT - RICHMOND, VA
38. BRENNON QUAY YOUNGBLOOD   EASTMAN CHEM. COMPANY – KINGSPO, TN
39. GUSTAVE K YOUNGGREN   DUKE ENERGY - CHARLOTTE, NC
40. ZIMMERMAN, DANIELLE ANN   NOVOZYMES – FRANKLINTON, NC
Career Placement

Employers Participating in On-Campus Interviewing CBEs (BS level) for 2007-2008 academic year. (*) indicates also attended Engineering Career Fair

ABB, Inc.
ABEC
*Accenture
Alarm.com
Albemarle Corp.
Alpha Vax
Argos
*Babcock & Wilcox Co.
*BE&K Engineering
Biogen-Idecc
Biolex
Buckman Labs, Inc.
*Caterpillar, Inc.
Cirrus Pharma
Cisco Systems, Inc.
Closure Medical
Constellation Energy
*Coty US LLC
CRB
Cryovac Sealed Air Corp.
Defense Nuclear Facilities Safety Board
*Deloitte Consulting
Diosynth Biotechnology
Dow Chemical Co.
DSM
*DuPont
Eastern Research Group
Eisai
Embrex
*Energizer Holdings, Inc.
*ExxonMobile
*Frito Lay, Inc.
*Georgia Pacific, LLC
*General Electric
Goodyear
GSK
*Halliburton
Heat Transfer Sales of the Carolinas
Hercules Inc.
*Infosys Technologies Ltd.
Integral Performance Engineering
Inspire
*International Paper

Invensys
*INVISTA
*Keyence Corporation of America
Kimberly-Clark Corporation
Kraft Foods
Lincoln Electric
*MeadWestvaco
*Merck & Co., Inc.
*Miclin North America
*Microstrategy, Inc.
*Milliken and Co.
Millipore
*Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic
Naval Surface Warfare Ctr. (Carderock Division)
*Newell Rubbermaid
NewPage Corporation
*Norfolk Naval Shipyard
Novartis
Omnova Solutions
*Packaging Corporation of America
Pall
Pilkingston North America
*Procter & Gamble
Quintiles
Rhodia Inc.
Samsung Austin Semiconductor
Sartorius
*Schluumberger OFS
Siemens Power Generation
Sygenta
Targacept
Tencarva Machinery Company
*Trane
Victaulic
Westinghouse Electric Co.

Employers Participating in Engineering Career Fair Seeking CBEs (BS Level) 2007-2008, but not included in list above.

AREVA NP
Army Evaluation Center
ATI Allvac
Avid Solutions
Baxter Healthcare Corp.
Belcan TechServices
Black & Veatch
Catalent Pharma Solutions
CDM
Central Intelligence Agency
CH2M HILL
Clark, Richardson & Biskup Consulting Engineers, Inc. (CRB)
Corning Incorporated
Cree Inc.
Duke Energy
Eastman Chemical Co.
Fidelity Investments
Fluor Corporation
Gerdau Ameristeel
Hospira, Inc.
I. Kruger, Inc.
ICF International
Idaho National Laboratory
ITT Night Vision
Jacobs
Johnson & Johnson/Closure Medical Corp.
Lord Corp.
Manhattan Associates
Mustang Engineering
Nan Ya Plastics Corp., America
Nalco Company
NAVAIR
NNE Pharmaplan
Northrop Grumman Corporation
Novo Nordisk Pharmaceutical Industries, Inc.
Novozymes N.A. Inc.
Oak Ridge National Laboratory
PARSONS
PCS Phosphate
Portsmouth Naval Shipyard
Qimonda
R.E. Mason Co./REM Services, Inc.
RoviSys
SCR-Tech
Shaw AREVA MOX Services, LLC
Sonoco Products Co.
Southern Co.
Talecris Biotherapeutics
The Boeing Co.
The Shaw Group, Inc.
TLV Corporation
Trinity Consultants
Tyco Electronics
U.S. Marines
U.S. Navy Officer Programs
U.S. Nuclear Regulatory Commission

U.S. Patent and Trademark Office
URS Corporation
Washington Savannah River Co.
Weyerhaeuser
Wyeth

North Carolina State University CBE’s (2008)
BS Level NCSU CBE Average Salary = $63,292

National Association of Colleges & Employers (NACE) Salary Survey (Spring 2008)
BS Level NACE CBE Average Salary = $63,616
North Carolina State University
Chemical and Biomolecular Engineering
Class of 2006
Graduate Program

The graduate program consists of both formal (classroom) educational activities and a research experience.

Graduate Student Enrollment - Fall 2007

<table>
<thead>
<tr>
<th>Category</th>
<th>On campus</th>
<th>Distance education</th>
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<tbody>
<tr>
<td>M.S. Candidates</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Ph.D. Candidates</td>
<td>89</td>
<td></td>
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<tr>
<td>Total</td>
<td>109</td>
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<table>
<thead>
<tr>
<th>Gender</th>
<th>Total</th>
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<tr>
<td>Men</td>
<td>74</td>
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<tr>
<td>Women</td>
<td>35</td>
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<tr>
<td>Total</td>
<td>109</td>
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</table>

<table>
<thead>
<tr>
<th>Citizenship</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>U.S. Citizens</td>
<td>54</td>
</tr>
<tr>
<td>Foreign</td>
<td>55</td>
</tr>
<tr>
<td>Total</td>
<td>109</td>
</tr>
</tbody>
</table>

The foreign students come from 15 countries: Bangladesh, China, Columbia, Egypt, France, Indonesia, Jordan, Kuwait, India, Korea, Panama, Slovakia, Taiwan, Turkey, and Venezuela.

Trends in M.S. Degrees Granted

Trends in Graduate Enrollment

Trends in Ph.D. Degrees Granted
### Graduate Students, 2007-2008

<table>
<thead>
<tr>
<th>Student</th>
<th>Advisor</th>
<th>Undergraduate School</th>
<th>Matriculated</th>
</tr>
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<tbody>
<tr>
<td>Aberg, Chris</td>
<td>Spontak</td>
<td>U of Maryland</td>
<td>Fall 2004</td>
</tr>
<tr>
<td>Aguda, Remil</td>
<td>Kilpatrick</td>
<td>U of the Philippines</td>
<td>Fall 2004</td>
</tr>
<tr>
<td>Ahmed, Shoeb</td>
<td>Haugh</td>
<td>Bangladesh</td>
<td>Fall 2007</td>
</tr>
<tr>
<td>Ahmed, Tamer</td>
<td>DeSimone/Roberts</td>
<td>Cairo University</td>
<td>Fall 2002</td>
</tr>
<tr>
<td>Anderson, Matthew</td>
<td>Rao</td>
<td>West Virginia</td>
<td>Fall 2006</td>
</tr>
<tr>
<td>Arifuzzaman, Shafi</td>
<td>Genzer</td>
<td>Bangladesh University</td>
<td>Fall 2004</td>
</tr>
<tr>
<td>Arvidson, Sara</td>
<td>Khan/Gorga</td>
<td>South Carolina</td>
<td>Fall 2006</td>
</tr>
<tr>
<td>Aurnik, Kate</td>
<td>Kelly</td>
<td>Notre Dame</td>
<td>Fall 2004</td>
</tr>
<tr>
<td>Azeez, Fadhel</td>
<td>Fedkiw</td>
<td>Kuwait University</td>
<td>Fall 2003</td>
</tr>
<tr>
<td>Bain, Eric</td>
<td>Genzer</td>
<td>U of Alabama</td>
<td>Fall 2005</td>
</tr>
<tr>
<td>Barua, Dipak</td>
<td>Parsons/Osburn</td>
<td>Bangladesh</td>
<td>Fall 2003</td>
</tr>
<tr>
<td>Boehler, Emily</td>
<td>Hall</td>
<td>Penn State</td>
<td>Fall 2007</td>
</tr>
<tr>
<td>Bonino, Chris</td>
<td>Khan</td>
<td>U of Rochester</td>
<td>Fall 2006</td>
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<tr>
<td>Brown, Eva “Kate”</td>
<td>Henderson</td>
<td>VCU</td>
<td>Fall 2007</td>
</tr>
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<td>Cain, Nathaniel</td>
<td>Roberts</td>
<td>VCU</td>
<td>Fall 2004</td>
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<td>Chang, Suk Tai</td>
<td>Velev</td>
<td>Kwangju</td>
<td>Fall 2003</td>
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<td>Chin, Paul</td>
<td>Roberts</td>
<td>Cornell</td>
<td>Fall 2001</td>
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<td>Chou, Chung-jung</td>
<td>Kelly</td>
<td>National Taiwan University</td>
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<td>Chu, Hsiao Mei (Annie)</td>
<td>Khan</td>
<td>Connecticut College</td>
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<td>Comfort, Kristen</td>
<td>Haugh</td>
<td>University of Dayton</td>
<td>Fall 2002</td>
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<td>Cooper, Charlotte</td>
<td>Peretti</td>
<td>USC at Columbia</td>
<td>Fall 2005</td>
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<td>Cirit, Murat</td>
<td>Haugh</td>
<td>Middle East Technical Univ.</td>
<td>Fall 2005</td>
</tr>
<tr>
<td>Cushing, Kerri</td>
<td>Peretti</td>
<td>UFL</td>
<td>Fall 2005</td>
</tr>
<tr>
<td>Dong, Laura Beth</td>
<td>Roberts</td>
<td>Mississippi State</td>
<td>Fall 2004</td>
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<td>Kelly</td>
<td>VA Tech</td>
<td>Fall 2007</td>
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<tr>
<td>Galvin, Casey</td>
<td>Genzer</td>
<td>Northwestern</td>
<td>Fall 2007</td>
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<tr>
<td>Gangwal, Sumit</td>
<td>Velev</td>
<td>NC State</td>
<td>Fall 2005</td>
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<tr>
<td>Gera, Nimish</td>
<td>Rao</td>
<td>IIT, Guwahati</td>
<td>Fall 2006</td>
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<tr>
<td>Glicksman, Matthew</td>
<td>Parsons</td>
<td>UFL</td>
<td>Fall 2006</td>
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<tr>
<td>Gong, Bo</td>
<td>Parsons</td>
<td>Tianjin</td>
<td>Fall 2007</td>
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<td>Goyal, Amit</td>
<td>Hall/Velev</td>
<td>IIT, Roorkee</td>
<td>Fall 2003</td>
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<td>Gozen, Omer</td>
<td>Genzer/Spontak</td>
<td>Bogazici University</td>
<td>Fall 2004</td>
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<td>Gray, Steven</td>
<td>Kelly</td>
<td>UVA</td>
<td>Fall 2003</td>
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<tr>
<td>Gupta, Shalini</td>
<td>Kilpatrick/Velev</td>
<td>I.I.T.-Kanpur</td>
<td>Fall 2002</td>
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<tr>
<td>Harris, Morgan</td>
<td>Kelly</td>
<td>NCA&amp;T</td>
<td>Fall 2003</td>
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<td>Heldt, Caryn</td>
<td>Carbonell</td>
<td>Michigan Tech</td>
<td>Fall 2003</td>
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<td>Herigstad, M. Omon</td>
<td>Carbonell</td>
<td>Colorado State</td>
<td>Fall 2003</td>
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<td>Huang, Liangliang</td>
<td>Gubbins</td>
<td>Nanjing</td>
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<td>Rao</td>
<td>Bangladesh</td>
<td>Fall 2006</td>
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<tr>
<td>Hussain, Yazen</td>
<td>Grant</td>
<td>Jordan University</td>
<td>Fall 2001</td>
</tr>
<tr>
<td>Immer, Jeremy</td>
<td>Lamb</td>
<td>U of Kansas</td>
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<td>Jain, Surendra</td>
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<td>Fall 2002</td>
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<td>Jenkins, Jessica</td>
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<td>Jerrim, Lindsey</td>
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<td>Jhon, Youngkuk</td>
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<td>Fall 2003</td>
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<td>Kleinert, Jairuk</td>
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<td>Fall 2006</td>
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<td>Koo, Hyung Jun</td>
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<td>Fall 2007</td>
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<td>Krajcovic, Matej</td>
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<td>U of Maine</td>
<td>Fall 2005</td>
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<tr>
<td>Name</td>
<td>Advisor</td>
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<td>Krishnan, Arjun</td>
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<td>IIT-Madras</td>
<td>Fall 2005</td>
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<td>Kuncicky, Daniel</td>
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<td>Univ. of Florida</td>
<td>Fall 2002</td>
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<td>Lewis, Derrick</td>
<td>Kelly</td>
<td>U of South Alabama</td>
<td>Fall 2004</td>
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<td>Fall 2002</td>
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<td>Liu, Haiyan</td>
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<td>ShanDong University</td>
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<td>Loebl, Andrew</td>
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<td>Fall 2006</td>
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<td>Lynch, Elizabeth</td>
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<td>Malik, Ravish</td>
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<td>Manasco, Joshua</td>
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<td>USC</td>
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<td>Melvin, Adam</td>
<td>Haugh</td>
<td>U of Arizona</td>
<td>Fall 2004</td>
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<td>Michel, Joshua</td>
<td>Kelly</td>
<td>Univ. California, Davis</td>
<td>Fall 2000</td>
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<td>Misal, Shriraj</td>
<td>Genzer</td>
<td>UICT – Mumbai</td>
<td>Fall 2006</td>
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<td>Moore, Joshua</td>
<td>Gubbins</td>
<td>Rose-Hulman</td>
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<td>Na, Jeong-Seok</td>
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<td>Hanyang</td>
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<td>Ozcam, Evren</td>
<td>Spontak</td>
<td>Middle East Technical Univ.</td>
<td>Fall 2005</td>
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<td>Ozdemir, Inci</td>
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<td>Peng, Qing</td>
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<td>Ponder, Celia</td>
<td>Overcash</td>
<td>NCA&amp;T</td>
<td>Fall 2004</td>
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<td>Rastogi, Vinayak</td>
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<td>Roskov, Kristen</td>
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<td>Santiso, Erik</td>
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<td>Universidad Simon Bolivar</td>
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<td>Sarkar, Prasenjit</td>
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<td>Guwahati</td>
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<td>So, Ju-Hee</td>
<td>Dickey</td>
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<td>Strickland, Andy</td>
<td>Hall/Genzer</td>
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<td>Khan</td>
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<td>Fall 2006</td>
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<td>Sun, Xiaoyu</td>
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<td>Tachdjian, Sabrina</td>
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<td>CPE Lyon</td>
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<td>Talwar, Sachin</td>
<td>Khan</td>
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<td>Harvey Mudd College</td>
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<td>Tombokan, Xenia</td>
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<td>Vanfossen, Amy</td>
<td>Kelly</td>
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<td>Vargantwar, Pruthesh</td>
<td>Spontak</td>
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<td>Fall 2007</td>
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<td>Verruto, Vincent</td>
<td>Kilpatrick</td>
<td>Delaware</td>
<td>Fall 2003</td>
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<tr>
<td>Wagoner, Victoria</td>
<td>Hall</td>
<td>UNC</td>
<td>Spr 2003</td>
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<td>Wang, Chun-Chao</td>
<td>Haugh</td>
<td>Nat'l Taiwan University</td>
<td>Fall 2003</td>
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<td>Weaver, Juan</td>
<td>Spontak</td>
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<td>Weiger, Michael</td>
<td>Haugh</td>
<td>Colorado State</td>
<td>Fall 2002</td>
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<td>Willoughby, Julie</td>
<td>Genzer</td>
<td>U of Kentucky</td>
<td>Fall 2002</td>
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<td>Woodhead, Jeffrey</td>
<td>Carbonell/DeSimone</td>
<td>Vanderbilt</td>
<td>Fall 2003</td>
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<td>Yadav, Rameshwar</td>
<td>Fedkiw/DeSimone</td>
<td>IIT-BHU-Varanasi</td>
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<td>Yang, Haiou</td>
<td>Carbonell</td>
<td>Tsinghua University</td>
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<td>Yun, Long</td>
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<td>Zhejiang</td>
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<td>Zhou, Qian</td>
<td>Henderson</td>
<td>Harbin</td>
<td>Fall 2007</td>
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<td>Zhou, Rui</td>
<td>Hall</td>
<td>Zhejiang</td>
<td>Fall 2007</td>
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</table>
Graduate Degree Recipients 2006-2007

Master of Science (M.S.) Degrees

August 2007

**Remil Martinez Aguda**

*Solubility Modeling of Sclareol in Pure Organic Solvents And CO2-Ethyl Lactate Mixtures*

(Peter K. Kilpatrick/ Ruben G. Carbonell)

B.S. University of the Philippines Los Banos
M.S. University of the Philippines
Process Engineer, Talecris

August 2007

**Ali Evren Ozcam**

(Course Only)

(Richard J. Spontak/Jan Genzer)
B.S., Middle East Tech University
Ph.D. Program, NC State

**Joseph Sitko**

(Distance Education)
(Saad A. Khan)
B.S., Drexel University
KBI BioPharma, Inc.

August 2007

**Joshua L. Manasco**

(Course Only)
(Saad A. Khan)
B.S., University of SC
Ph.D. Program, NC State

December 2007

**Charlotte R. Cooper**

(Course Only)
(Robert M. Kelly)
B.S., University of SC
Ph.D. Program, N.C. State

**Sumit Gangwal**

(Course Only)
(Orlin Velev)
B.S., N.C. State
Ph.D. Program, N.C. State

**Arjun S. Krishnan**

(Course Only)
(Richard J. Spontak)
B.S., IIT, Madras
Ph.D. Program, N.C. State

**Ravish Malik**

(Course Only)
B.S., IIT- Roorkee
Ph.D. Program, N.C. State

**Nisha Shah**

(Distance Education)
(Saad A. Khan)
B.S., Georgia Tech
Glaxo SmithKline
Doctor of Philosophy (Ph.D.) Degrees
August 2007

Chung-Jung Chou
Functional Genomics
Analysis of Biohydrogen
Production by Hyperthermophilic Microorganisms
(Robert M. Kelly)
B.S., National Taiwan University
M.S., National Taiwan University
Post-doc, NCSU Chemistry

December 2007

Tamer S. Ahmed
Copolymerization of Vinylidene Fluoride with Hexafluoropropylene in Supercritical Carbon Dioxide
(George W. Roberts)
B.S., Cairo University
M.S., Cairo University

Kristen Krupa Comfort
Signaling Pathways Activated by Interleukin-2 and Interleukin-4 Receptors Mediate T Lymphocyte Clonal Expansion
(Jason M. Haugh)
B.S., University of Dayton

Shalini Gupta
On-chip Assembly of Electrically Functional Structures from Biological and Colloidal Particles
(Orlin Velev)
B.S., IIT, Varanasi
Post-doc, Imperial College, London

Joshua K. Michel
Identification, Characterization, and Physiologic Analysis of Proteolytic Enzymes in Hyperthermophilic Organisms
(Robert M. Kelly)
B.S., UC, Davis

Daniel M. Kuncicky
Characterization and Engineering Of the Process of Directed Particle Self-Assembly in Thin Films and Sessile Droplets
(Orlin Velev)
B.S., University of Florida
Florida Environmental Protection Agency

Yong Li
Life Cycle Assessment of Chemical Processes and Products
(Christine S. Grant/Michael R. Overcash)
B.S., Tianjin Institute of Light Industry
M.S., University of Maryland, College Park
M.S., Tianjin University
Post-doc, Georgia Tech

Julie Ann-Crowe Willoughby
Design & Synthesis of Silicone Elastomer Networks with Tunable Physico-Chemical Characteristics
(Jan Genzer)
B.S., University of Kentucky
Scientist, Mead Westvaco
Doctor of Philosophy (Ph.D.) Degrees

December 2007

**Erik E. Santiso**
*Effect of Confinement on Chemical Reactions*  
(Keith E. Gubbins)  
B.S., Universidad Simon Bolivar  
M.S., Universidad Simon Bolivar  
Post-doc, MIT, Boston, MA

**Sachin Talwar**  
*Hydrophobically Modified Associative Polymers: Solution Rheology and Electrospun Nanofibers*  
(Saad A. Khan)  
B.S., IIT, Roorkee  
Dupont, Richmond, VA

**Sabrina Tachdjian**
*Functional Genomics of Stress Response in the Hyperthermophilic Crenarchaeon Sulfolobus Solfactarius and Role of vapBC Toxin-Antitoxin Loci in RNA Management*  
(Robert M. Kelly)  
B.S., UTC, Compeigne, France

**Michael Weiger**  
*Integration of soluble and adhesive signals during fibroblast migration*  
(Jason M. Haugh)  
B.S., Colorado State

Doctor of Philosophy (Ph.D.) Degrees

May 2008

**Surendra Jain**
*Molecular Modeling of Microporous And Templated Mesoporous Carbons*  
(Keith E. Gubbins)  
B.S., IIT, Kharagpur

**Xiaoyu Sun**
*Concurrent and Sequential Surface Modification of Electrospun Polymer Micro/Nanofibers*  
(Richard J. Spontak)  
B.S., Tsinghua University  
M.S., Tsinghua University  
Sabic, Mt. Vernon, IN
Graduate Fellowships and Awards, 2007-2008

Alumni Association

Jessica Jenkins

GAANN Biotechnology Fellowships

Derrick Lewis
Amy VanFossen
Jeff Woodhead
Christina Tang

Dean’s Fellowship

Chris Bonino
Sara Arvidson
Matthew Glicksman
Andrew Loebl
Jarius Kleinert
Jessica Jenkins
Emily Boehler
Andrew Frock

GAANN Computational Fellowships

Erin Phelps
Victoria Wagoner
Joshua Moore

GAANN Electronic Materials Fellowship

Christopher Bonino
Matthew Glicksman

National Science Foundation Fellows

Laura Beth Dong
Kristen Roskov

National Institutes of Health Biotechnology Traineeship Program

Jairus Kleinert
Charlotte Cooper

Clontz Milliken Fellowship

Sara Arvidson

Provost Fellowship

Jessica Jenkins
Emily Boehler
Career Placement

Employers Participating in On-Campus Interviewing ChEs (MS & PhD level) for 2007-2008 academic year. (*) indicates also attended Engineering Career Fair

Accenture
Albemarle
Anadigics
Beam Global Spirits & Wine
BE&K Engineering
*Caterpillar, Inc.
*Central Intelligence Agency
Cryovac Sealed Air Corp.
Dow Chemical Co.
*DuPont
Eastern Research Group
*Eastman Chemical Company
*ExxonMobil
*General Electric Company
General Mills
Goodyear
*Halliburton
IBM
International Paper
Kraft Foods NA
Lincoln Electric
*MeadWestvaco
*Micelin NA
*Micron Technology
*Microstrategy, Inc.
Naval Surface Warfare Center/Carderock Div.
*Newell Rubbermaid
Packaging Corporation of America
*Procter & Gamble
Samsung Austin Semiconductor
*Schlumberger OFS
The Timken Co.
Westinghouse Electric Co.

Employers Participating in Engineering Career Fair Seeking ChEs (MS & PhD Level) 2007-2008, but not included in list above.

AREVA NP
Army Evaluation Center

ATI Allvac
Belcan TechServices
Black & Veatch
CDM
CH2M HILL
Clark, Richardson & Biskup Consulting Engineering, Inc.
Corning Incorporated
COTY US LLC
Cree, Inc.
Deloitte Consulting
Duke Energy
Energizer
Fidelity Investments
Fluor Corp.
Hospira
I. Kruger, Inc.
ICF International
Idaho National Laboratory
INVISTA
ITT Night Vision
Jacobs
Keyence Corporation of America
Lord Corp.
Manhattan Associates, Inc.
Merck & Co.
Nalco Co.
Nan Ya Plastics Corp., America
NAVFAC Atlantic
NNE Pharmaplan
Northrop Grumman Corp.
Oak Ridge National Laboratory
Parsons
PCS Phosphate
PCS Phosphate
Qimonda
Sonoco
Talecris Biotherapeutics
The Boeing Co.
The Shaw Group, Inc.
Trinity Consultants
TVL Corp.
Tyco Electronics
U.S. Navy Officer Program
U.S. Nuclear Regulatory Commission
U.S. Patent & Trademark Office
URS Corporation
Washington Savannah River Co.
Weyerhaeuser Co.
Wyeth

National Association of Colleges & Employers (NACE) Salary Survey (Winter 2008)

MS Level ChE = $70,903
PhD Level ChE = $87,000
Research Expenditures

The following graph illustrates the trends in total expenditures from research grants and contracts (not including academic faculty salaries or discretionary funds). These expenditures reflect faculty summer salaries, release time, student salaries (both graduate and undergraduate performing research), equipment, supplies, services, printing, postage, and other operational costs related to research.
Faculty Activities

The Chemical and Biomolecular Engineering faculty at North Carolina State University is an outstanding group of teacher-scholars whose interests encompass most areas of research in chemical engineering. The faculty have strong research associations with not only the traditional academic funding groups in the federal government — NSF, DOE, ARO, NIH, DARPA and others — but also with a number of major corporate sponsors, including DuPont, Eaton Corporation, MeadWestvaco, Novozymes, Phillip Morris USA, and Siemens, Inc.

Chemical engineering education has always had a high priority in our department, and our faculty feels a strong sense of responsibility to provide a high quality educational experience for our undergraduate and graduate students. The Department takes great pleasure in providing a scholarly environment where our faculty can develop a balanced approach towards excellence in both teaching and research.

Chemical and Biomolecular Engineering Faculty

Lisa G. Bullard, Teaching Associate Professor and Coordinator of Undergraduate Advising (919/515-7455); PhD, Chemical Engineering, Carnegie Mellon University (1991); multidisciplinary process design, teaching effectiveness, advising, educational outreach to K-12. [lisa_bullard@ncsu.edu]

Ruben G. Carbonell, Frank Hawkins Kenan Distinguished Professor, Co-director of NSF Science and Technology Center for Environmentally Responsible Solvents and Processes, Director of the William R. Kenan Jr. Institute for Engineering, Technology and Science, and Director of the Golden LEAF Biomanufacturing Training and Education Center (919/515-2499); PhD, Chemical Engineering, Princeton University (1973); biochemical engineering, molecular recognition, bioseparations, immunodiagnostics, colloid and interface science, transport phenomena. [ruben@ncsu.edu]

Joseph M. DeSimone, Chancellor's Eminent Professor of Chemistry at the University of North Carolina at Chapel Hill, William R. Kenan, Jr. Distinguished Professor of Chemical Engineering at North Carolina State University, Co-director of NSF Science and Technology Center for Environmentally Responsible Solvents and Processes (919/962-2166); PhD, Polymer Chemistry, Virginia Tech (1990); polymer chemistry and physics, chemistry in compressed media, design of interfacially active agents for near and supercritical fluids, environmentally benign solvents for industrial processes. [desimone@unc.edu]

Kirill Efimenko, Assistant Research Professor (919/513-0548); PhD, Material Science and Engineering, Institute of Chemical Technology Prague (1999); functional polymers, chemical/physical modification of polymer films, structural assemblies of macromolecules, responsive polymer coatings. [efimenko@ncsu.edu]

Peter S. Fedkiw, Department Head (Effective December 31, 2007) and Professor (919/515-3572); PhD, Chemical Engineering, University of California, Berkeley (1978); electrochemical reaction engineering; electrocatalysis, environmental applications of electrochemistry. [fedkiw@ncsu.edu]

Michael C. Flickinger, Professor (joint with Microbiology) (919/515-0175); PhD University of Wisconsin (1977); microbial biocatalytic coatings, advanced nanostructured biocatalytic materials, bionanotechnology, bioseparations using inorganic media [michael_flickinger@ncsu.edu]

Jan Genzer, Associate Department Head and Professor (919/515-2069); PhD, Materials Science and Engineering, University of Pennsylvania (1995); physics of thin polymer films, interfacial polymer science, morphology control of heterophase polymers, structure/formation of polymer-based nanocomposites. [jan_genzer@unity.ncsu.edu]

Christine S. Grant, Professor and Associate Dean of Faculty Development and Special Initiatives in the College of Engineering (919/515-2317); PhD, Chemical Engineering, Georgia Institute of Technology (1989); surface and interfacial science, mass transfer, environmental engineering, green chemistry. [grant@ncsu.edu]

Keith E. Gubbins, H. Clark Professor (919/513-2262); PhD, Chemical Engineering, University of London (1962); molecular modeling of nanostructured materials, thermodynamics and rate processes in nanoporous and structured materials. [keg@ncsu.edu]
Carol K. Hall, Camille Dreyfus Distinguished University Professor (919/515-3571); PhD, Physics, SUNY Stony Brook (1972); molecular thermodynamics and computer simulation of polymeric interfaces, nanoparticle self-assembly, protein aggregation, DNA hybridization [hall@turbo.che.ncsu.edu]

Jason Haugh, Associate Professor (919/513-3851); PhD, Chemical Engineering, Massachusetts Institute of Technology (1999); signal transduction networks, intracellular processes, biomedical engineering, theoretical biology. [jason_haugh@ncsu.edu]

Wesley A. Henderson, Assistant Professor (919/513-2917); PhD, Materials Science & Engineering, University of Minnesota (2002); electrolytes for electrochemical energy technologies (batteries, capacitors, fuel cells), ionic liquids, lignocellulosic biomass pretreatment and conversion to fuels and chemicals. [whender@ncsu.edu]

Robert M. Kelly, Alcoa Professor and Director of the NC State Biotechnology Program (919/515-6396); PhD, Chemical Engineering, NC State University (1981); biochemical engineering, biocatalysis at extremely high temperatures, microbial physiology, enzyme engineering. [rmkelly@ncsu.edu]

Saad A. Khan, Professor and Director of Graduate Program (919/515-4519); PhD, Chemical Engineering, MIT (1985); rheology and microstructure of complex materials - gels, suspensions, associative and biopolymers; functional nanofibers [khan@ncsu.edu]

Peter K. Kilpatrick, Professor and Head (July 1, 2007 to December 31, 2007); PhD, Chemical Engineering, University of Minnesota (1983); surfactant and interfacial science, fluid microstructure, colloidal aggregates, phase equilibria, biotechnology. [peter-k@ncsu.edu]

H. Henry Lamb, Professor (919/515-6395); PhD, Chemical Engineering, University of Delaware (1988); catalysis and biocatalysis, biochemical engineering, surface science. [lamb@ncsu.edu]

P. K. Lim, Professor (919/515-2328); PhD, Chemical Engineering, University of Illinois (1979); interfacial phenomena, homogeneous catalysis, free radical chemistry. [lim@ncsu.edu]

David F. Ollis, Distinguished Professor (919/515-2329); PhD, Chemical Engineering, Stanford (1969); engineering education, technology literacy, photochemical engineering. [ollis@ncsu.edu]

Gregory N. Parsons, Professor (919/515-7553); PhD, Physics, NC State University (1990); surface reactions and chemical processes in electronic materials synthesis, bonding structure and electronic properties of inorganic semiconductors and insulators, physics of thin film devices. [parsons@ncsu.edu]

Steven W. Peretti, Associate Professor (919/515-6397); PhD, Chemical Engineering, California Institute of Technology (1986); metabolic characterization and manipulation. [peretti@ncsu.edu]

Balaji Rao, Assistant Professor (919/513-0129); Ph.D. Chemical Engineering, MIT (2004); Cell, Stem Cell and Molecular Bioengineering; Therapeutic Protein Biotechnology. [bmrao@ncsu.edu]

George W. Roberts, Professor Emeritus (919/515-7328); ScD, Chemical Engineering, MIT (1965); chemical reaction engineering, applied catalysis, chemical reactor analysis and design, pollution prevention and control, polymerization. [groberts@ncsu.edu]

Richard J. Spontak, Professor (joint with Materials Science and Engineering) (919/515-4200); PhD, Chemical Engineering, University of California at Berkeley (1988); polymer microscopy and scattering, morphology/property design and characterization of nano/microstructured polymers and polymer nanocomposites, polymer physics. [rich_spontak@ncsu.edu]

Orlin Velev, Associate Professor (919/513-4318); PhD, Physical Chemistry, University of Sofia and Bulgarian Academy of Sciences (1996); Colloidal nanoscience and nanoengineering, microfluidics and on-chip devices for materials synthesis and manipulation, assembly of nano- and microstructures with photonic, optical, biological and electrical functionality, colloidal interactions, self-assembly and crystallization, biosensors and microrobotics. [odvelev@unity.ncsu.edu]

Anka Veleva, Assistant Research Professor (919/515-7176); PhD, Physical Chemistry, Bulgarian Academy of Sciences (1993); biomaterials, tissue engineering of vascular grafts, design of biomimetic surfaces, cell-based bioassays, clinical diagnostics. [anveleva@unity.ncsu.edu]
Activities by Faculty Member

**Bullard, Lisa**
Teaching Associate Professor and Director of Undergraduate Studies
B.S. North Carolina State University (1986)

**Interests:** Multidisciplinary process design, teaching effectiveness, advising, educational outreach to K-12.

**2007-2008 Publications**

**Published (Refereed)**


**Contributed Presentations**


Carbonell, Ruben G.

Suit 3200, Partners I
Frank Hawkins Kenan Distinguished Professor
Director, William R. Kenan, Jr. Institute for Engineering, Technology & Science
Co-Director, NSF Science and Technology Center for Environmentally Responsible Solvents and Processes
Director, Golden LEAF Biomanufacturing Training and Education Center
B.S. Manhattan College (1969)
Ph.D. Princeton University (1973)

Interests: Biochemical engineering; molecular recognition; bioseparations; immunodiagnostics; colloid and interface science; transport phenomena

2007-2008 Publications

Published (Refereed)

J. Kim, J. B. McClain, and R.G. Carbonell, Deposition of poly[2-(perfluorooctyl)ethyl acrylate] by the Displacement of Two Immiscible Supercritical Phases (DISP), J. of Supercritical Fluids, 43, 139-149 (2007).


Invited Lectures and Presentations

Seminar at BiogenIdec, Research Triangle Park, NC (9/9/07)
Small Peptide Ligands for Affinity Protein Purification

Seminar at NCBC, BPD Bioseparations Workshop (2/21/08)
Fc Binding Peptides for Affinity Purification of Antibodies

Recovery of Biological Products Conference XIII, Quebec, CA (6/24/08) Fc Binding Peptides for Affinity Purification of Human Immunoglobulin G

Elementary School Outreach: Career Day, Brentwood Elementary, Raleigh, NC (3/13/08)
DeSimone, Joseph M.
William R. Kenan Jr. Distinguished Professor
of Chemical Engineering (NCSU)
Chancellor’s Eminent Professor of Chemistry (UNC Chapel Hill)
B.S. Ursinus College (1986)
Ph.D. Virginia Polytechnic Institute and State University (1990)

Interests: New strategies for the delivery of detection, imaging and therapeutic agents for the battle against human disease; Nanomedicine; Fluoropolymers: photolithography, fuel cells, microfluidics, minimally adhesive surfaces; Medical devices; Colloid, surfactant and surface chemistry; Particle Jamming and un-jamming; Polymer synthesis and processing in carbon dioxide: new polymers, interfacial science and colloids, reaction kinetics and engineering, green chemistry.

2007-2008 Publications

Published (Referred)


Publications Submitted

Invited Presentations


Fedkiw, Peter S. 2006 EB1
Department Head (December 31, 2007 to June 30, 2008) and Professor
B.S. University of Delaware (1974)  (919) 515-3572
Ph.D. University of California, Berkeley (1978) fedkiw@eos.ncsu.edu

Interests: Electrochemical reaction engineering; electrocatalysis; environmental applications of electrochemistry

2007-2008 Publications

Published (Refereed)


Contributed Presentations

“Synthesis of graphite coated Si-CuO composite as an anode for lithium ion battery by an abrasion-type mill,” 213th Electrochemical Society Meeting, Phoenix, May 2008 (with C.K. Lee).


“Lithium bis(oxalato)borate (LiBOB)-based Electrolyte for Lithium-ion Batteries,” 212th Electrochemical Society Meeting, Washington DC, October 2007 (with Fadhel Azeez).
Flickinger, Michael C.

Professor (Also Professor of Microbiology, CALS)

Associate Director, Academic Programs

Golden LEAF Biomanufacturing Training and Education Center (BTEC)

B.S. University of Wisconsin, Madison (1973)

M.S. University of Wisconsin, Madison (1975)

Ph.D. Ph.D: University of Wisconsin (1977)

Interests: Microbial biocatalytic coatings, advanced nanostructured biocatalytic materials, bionanotechnology, bioseparations using inorganic media

2007-2008 Publications

Published (Refereed)


Refereed Reviews, Book Chapters, and Other Publications


Invited Research Presentation


“Hydrogen Production by Photo- Reactive *Rhodopseudomonas palustris* Latex coatings: Fundamental Engineering and Future Bioenergy Applications” Savannah River National Laboratories (DOE, SRNL), Center for Hydrogen Energy (CHE), Aiken, SC.

“Hydrogen Production by Photo- Reactive *Rhodopseudomonas palustris* Latex Coatings: Fundamental Engineering and Future Bioenergy Applications” International Conference on BioEconomy, Tainjin, China

Contributed Posters


J. Gosse, B. J. Engel, F.E. Rey, C. Harwood, M.C. Flickinger “Nanoporous Latex Coatings Containing *Rhodopseudomonas palustris* Pigment Mutants Spatially Distributed for Hydrogen Production” 8th International Hydrogenase Conference, Breckenridge, CO. (presented by Jimmy Gosse)

Baskaya, S.F., M.C. Flickinger and P. Wang “Manipulation of Multienzyme Catalysis with In-Situ Cofactor Regeneration for Production of Methanol from Biomass CO₂” 30th Symposium on Biotechnology for Fuels and Chemicals, New Orleans, LA. (presented by Ping Wang)
Genzer, Jan
Professor
Dipl-Ing. Institute of Chemical Technology, Czech Republic (1989)
Ph.D. University of Pennsylvania (1996)

Interests: Behavior of polymers and organic liquids at interfaces and confined geometries

2007-2008 Publications

Publications (Refereed)


Publications in Preparation/Submitted


Book Chapters


Publications in non-Refereed Journals


Invited Presentations

Key attributes of surface-bound molecular and macromolecular gradients, Macro 2008 – Polymers at Frontiers of Science & Technology, Taipei, Taiwan.

Engineered polymer surfaces for tailored bioadsorption and foul-release, Harvard University, BASF/Harvard Advanced Research Initiative.

Multivariant polymer brush assemblies: Formation and applications, University of Houston, Houston, TX.

Propagating waves of self-assembly in organosilane monolayers, American Chemical Society April 2008 meeting, New Orleans, LA.

On the consequences of being a colleague of Ruben G. Carbonell, American Chemical Society April 2008 meeting, New Orleans, LA.

Surface Engineering with Tailored Polymers, Xerox Corporation, Mississauga, ON, Canada.

Interfacial engineering using heteropolymers with adjustable monomer sequences (HAMS), American Physical Society March 2008 meeting, New Orleans, LA.

Gradients and Polymer Surfaces, DPOLY Short course “High-Throughput Approaches to Polymer Physics and Materials Science”, APS 2008, New Orleans, LA.

Engineering surfaces with soft materials, NC State University, Department of Materials Science & Engineering.

Engineering surfaces with soft materials, Dow Chemical Company, Midland, MI.

Engineered polymer coatings for foul-release applications, 54th meeting of the American Vacuum Society, Seattle, WA.

Formation and applications of multivariant polymer brush assemblies, Department of Chemical Engineering, Lehigh University, Bethlehem, PA.


Combinatorial polymer brushes as a novel platform for studying partitioning of biomolecules on man-made surfaces, BIOSURF VII Conference on “Functional Interfaces to Direct Biological Responses”, August 29 – 31, 2007, University and ETH Zurich, Switzerland.

In silico polymerization: Computer simulation of controlled radical polymerization in bulk and on flat surfaces, 2007 Telluride Workshop on Polymer Theory vs Polymer Experiment, Telluride, Colorado.

Key attributes of surface-bound molecular and macromolecular gradients, 2006 Gordon Research Conference on Chemistry at Interfaces, Waterville Valley, NH.

Contributed Presentations


Thermal response of surface-grafted PNIPAAm analyzed by means of nanoparticle markers, Presented at SoftMatt-2008 meeting, June 2008, NCSU, Raleigh, NC (with G. Fischer and J. Tracy).

Thermal response of surface grafted PNIPAAm analyzed by means of nanoparticle

Solution phase behavior of random copolymers with adjustable monomer sequence distribution, Presented at 82nd Colloid & Interfaces meeting, June 2008, NCSU, Raleigh, NC (with Y.K. Jhon).

Kinetics and Mechanism of Bromination of Polystyrene: In Bulk and at Surface, Presented at 82nd Colloid & Interfaces meeting, June 2008, NCSU, Raleigh, NC (with Y.K. Jhon).

Formation and Characterization of a Two-Component Self-Assembled Monolayer of Thiolate Containing Oligo(ethylene glycol) on Gold, Presented at 82nd Colloid & Interfaces meeting, June 2008, NCSU, Raleigh, NC (with F. Chen and others).

Multivariant Polymer Brushes - a New Platform for Understanding Surface-Protein Interactions, Presented at 82nd Colloid & Interfaces meeting, June 2008, NCSU, Raleigh, NC (with S. Arifuzzaman).


The effects of monomer sequence distribution and isotopic substitution on solution phase behavior of random copolymers, March meeting of the American Physical Society, New Orleans, LA (with Y.K. Jhon and R. Krishnamoorti).

Multivariant Polymer Brushes - a New Platform for Understanding Surface-Protein Interactions, Annual Richard D. Gilbert Symposium in Polymer Science, NC State University, March 2008 (with S. Arifuzzaman).


Initiators for novel surface-grafted polymerization studies, Presented at the NCSU chemical engineering Schoeneborn presentation, January 2008, NCSU, Raleigh, NC (with E.D. Bain).

Multivariant polymer brushes: A new platform for understanding surface-protein interactions, Presented at the NCSU chemical engineering Schoeneborn presentation, January 2008, NCSU, Raleigh, NC (with S. Arifuzzaman).


Molecular Motion in Poly(vinyl methyl siloxane) (PVMS), Southeastern section meeting of the American Physical Society, (with D. Stevens, J.A. Crowe, L.I. Clarke)


Manipulating Crosslinking Mechanisms for the Generation of Compliance Gradients, Materials Research Society Fall 2007 Meeting, Boston, MA,
November 2007 (with Kathy Fraley, Julie Crowe-Willoughby, Michael Weiger, and Jason Haugh).


Grant, Christine
Professor
M.S. Georgia Institute of Technology (1986)
Ph.D. Georgia Institute of Technology (1989)

Professor                 (919) 515-2317
grant@eos.ncsu.edu

Interests: Surface and Interfacial Science, Transport Phenomena, Pollution Prevention, Tribology: lubricants for MEMS and extreme environments

2007-2008 Publications

Publications (Refereed)


Y. Husssain, Y. Wu and C. S. Grant, “Dissolution of CO₂ Soluble Polymers Using a Quartz Crystal Microbalance”, *Journal of Supercritical Fluids* 42(2) 255 (2007).


Submitted Articles currently under review


Invited Presentations

C. Grant, “Rate processes in dissolution and adsorption processes of polymers”, *American Chemical Society*; New Orleans, LA, April 2008.


Gubbins, Keith
W. H. Clark Distinguished University Professor
Ph.D. University of London (1962)
B.S. Chemistry, University of London (1958)

Interests: Confined materials; adsorption; molecular stimulation; surface properties

2007-2008 Publications

Publications (Refereed)


Invited Presentations


Surface Nanostructure, Diffusion and Catalysis: The Role of Confinement and Surface Chemistry”, Second NSF US/Poland Workshop, Gdansk, Poland, June 3-6, 2008.

Papers Presented at National and International Conference


Invited Seminars

Joel Henry Hildebrand Award in the Theoretical and Experimental Study of Liquids, American Chemical Society, 2007.

Royal Society (London) Kan Tong Po Visiting Professor, University of Hong Kong, 2007.
Hall, Carol
Camille Dreyfus Distinguished University Professor
B.S. Physics, Cornell University (1967)
M.S. Physics, S.U.N.Y. at Stony Brook (1969)
Ph.D. Physics, S.U.N.Y. at Stony Brook (1972)

Interests: Molecular modeling and computer simulation are applied to: heteropolymers at interfaces, dipolar colloids, drug delivery, DNA hybridization, protein aggregation and amyloid formation

2007-2008 Publications

Publications (Refereed)


In Press and Submitted


Invited Presentations


“Computer Simulations of Protein Aggregation,” Chemical Engineering, Imperial College London, December 2007.


“Self Assembly of Dipolar Colloidal Particles: Designing Smart Materials,” Holtz Lecture, Chemical and Biomolecular Engineering , Johns Hopkins University , Baltimore, March 2008.

“Computer Simulations of Protein Aggregation,” Chemical Engineering, University of Utah , Salt Lake City, March 2008.


“Computer Simulations of Protein Aggregation,” Atlantic Coast Symposium on the Mathematical Sciences in Biology and Biomedicine, Raleigh, April 2008


“Confessions of an Ordinary Teacher---Dealing with the Big Fish”, Lowrie Lecture, Chemical and Biomolecular Engineering, Ohio State University, Columbus, May 2008.


**Contributed Presentations**

“Computer Simulation of Protein Aggregation Kinetics using an Intermediate Resolution Model.” AIChE Annual Meeting, Salt Lake City, November 2007. [with E. Phelps, presented by E. Phelps.]


“Phase Diagram of Systems of Dipolar Colloidal Particles: Designing Smart Materials Using Computer Simulation,“ AIChE Annual Meeting, Salt Lake City, November 2007. [with A. Goyal, presented by A. Goyal.]
Haugh, Jason M.  
Associate Professor  
B.S. North Carolina State University (1994)  
Ph.D. Massachusetts Institute of Technology (1999)  

Interests: Biomedical and biochemical engineering; signal transduction networks; mammalian cell engineering

2007-2008 Publications

Publications (Refereed)


Refereed Reviews, Book Chapters, and Other Publications


Invited Research Talks and Seminars


“Kinetic and spatial analysis of intracellular signal transduction networks.” Department of Biomedical Engineering IGERT seminar series, University of Texas, Austin, TX, 2/2008.

“Analysis of intracellular signal transduction networks.” Department of Chemical and Biological Engineering, Johns Hopkins University, Baltimore, MD, 4/2008.

**Contributed Presentations**


Henderson, Wesley Averett
Assistant Professor
B.S. University of California-Santa Barbara, CA (1996)
Ph.D. University of Minnesota (2002)
2088F EB1 (919) 513-2917 whender@ncsu.edu
Interests: Electrolytes for electrochemical energy technologies (batteries, capacitors, fuel cells), ionic liquids, lignocellulosic biomass pretreatment and conversion to fuels and chemicals

2007-2008 Publications


Invited, Keynote and Plenary Research Presentations and Seminars


Book Chapters and Invited Reviews (Refereed)


Submitted Manuscripts


Regular Contributed Research Presentations

Phase behavior and conductivity of Et₄NFTSI-LiTFSI mixtures - A model system for liquid battery electrolytes. 212th Meeting of The Electrochemical Society, Washington DC, Oct 7-12, 2007

Contributed Research Presentations by Students, Postdocs and Collaborators

Solvent-free lithium polymer batteries with PYR₁₄TFSI ionic liquids. 212th Meeting of The Electrochemical Society, Washington DC, Oct 7-12, 2007
Kelly, Robert M.
Suite 3309, Partners II
Alcoa Professor
University of Virginia (1975)
Director of NCSU Biotechnology Program
University of Virginia (1976)
B.S.
North Carolina State University (1981)
M.S.
Ph.D.
rmkelly@eos.ncsu.edu

Interests:
Biochemical engineering; biocatalysis at extremely high temperatures; microbial physiology;
enzyme engineering; functional genomics

2007-2008 Publications

Publications (Refereed)


Submitted


Nichols, J.D., M.R. Johnson, C.-J. Chou, and R.M. Kelly. Habitat, not LuxS, is the driving force behind AI-2 production in hydrothermal biotopes, submitted for publication.


Chou, C.-J., J.D. Nichols, A.L. VanFossen and R.M. Kelly Biohydrogenesis by the hyperthermophilic bacterium *Thermotoga maritima* during fermentation and co-fermentation of xylose and glucose, submitted for publication.

**Book Chapters**


**Invited Presentations**


Carson, Susan, John Chisnell, Melissa Cox, Joanna Miller, and Robert Kelly. Interdisciplinary Training of Engineers and Scientists in the Laboratory Components of Molecular Biotechnology at North Carolina State University. Biochemical Engineering XV, Quebec City, Quebec, Canada (July, 2007).

Kelly, R.M. Functional genomics approaches for examining intra- and inter-species interactions in microbial communities. Biochemical Engineering XV, Quebec City, Quebec, Canada (July, 2007).
Kelly, R.M. Extremely thermophilic microorganisms: Genes, genomes and genomics. Biotechnology Training Program, Northwestern University (June, 2007).


Kelly, R.M. Strategic opportunities for hyperthermophilic microorganisms and enzymes in bioenergy conversion processes Session #353 - Four Decades of Excellence in Crystallization and Separation Process Engineering Honoring Professor Ronald W. Rousseau and Professor Donald J. Kirwan, AIChE Annual Meeting, Salt Lake City, UT (November, 2007).

Kelly, R.M. Genes, genomes and genomics – The biology and biotechnology of extremophilic microorganisms. NC State Chapter of the Society of Sigma Xi, (April, 2007).


**Contributed Presentations**


Khan, Saad  
2034 EB1  
Professor  
(919) 515-4519  
B.S.E., Chemical Engineering, Princeton University  
Ph.D., Chemical Engineering, Massachusetts Institute of Technology.  
khan@eos.ncsu.edu

Interests:  
Rheology & Structures of Complex systems:  Gels, Suspensions, Nanocomposites, Associative polymers & Biopolymers

2007-2008 Publications

Publications (Refereed)


L. Ji, C. Saquing, S. A Khan and X. Zhang, “Synthesis and characterization of silica nanoparticulate-polyacrylonitrile composite and porous nanofibers” *Nanotechnology* 19 (2008), web release February 1


Refereed Publications under Review


C.D. Saquing and S.A. Khan, “Nanoparticle-templated Electrospun Nanofibers via a One-step Process”, *ACS Nano*


Invited Book Chapters


Invited Presentations and Courses

3rd International Conference on Engineering Sciences & Technologies, Cairo Egypt, March 2008 (Keynote Speaker): Functional Nanofibers via Electrospinning: Applications in Coatings, Drug Delivery and Biomedical Therapeutics.

Bangladesh Atomic Energy Commission (BAEC), Dec 2007: Functional Biomaterials: From Hydrogels to Nanofibers


Univ. Maryland, College Park MD, Nov 2007: Associative Polymer Networks and Functional Nanofibers: From Coatings to Biomedical Therapeutics.

International Conference on Natural Polymers (ICNP), Kottayam, India, Nov. 2007: Functional Nanofibers via Electrospinning: From Coatings to Biomedical Therapeutics

GE Global Research, Bangalore India, October 2007: Associative Polymer Networks and Functional Nanofibers: From Coatings to Biomedical Therapeutics.

Indian Institute of Sci (Dept. of Inorganic & Physical Chem), Bangalore India, October 2007: Associative Polymer Networks and Functional Nanofibers: From Coatings to Biomedical Therapeutics.

Engineering Foundation Conference on Associations in Solutions, Il Ciocco, Italy, Jul. 2007: Hydrophobic interactions and nanofiber formation in associative polymer systems.

U. Bologna, Italy Jul 2007: Functional Biomaterials: From Hydrogels to Nanofibers

Contributed Presentations

The Fiber Society Spring Conference, Mulhouse France, May 2008: Electrospun metal nanoparticle-alginate polymer blend nanofiber composites for biomedical applications

The Fiber Society Spring Conference, Mulhouse France, May 2008: Metall nanoparticles-loaded Al2O3 microtubes by atomic layer deposition on electrospun nanofiber templates

82nd Colloids & Surface Sci Symposium, Raleigh NC, Jun 2008: Composite Polyacrylonitrile Nanofibers with Silica Nanoparticles Via Electrospinning (by Chris Bonino)


82nd Colloids & Surface Sci Symp., Raleigh NC, Jun 2008: Functionalization of Nanofibers with Metal Nanostructures Using Novel Electrospinning-Based Methodologies (by Carl Saquing)


235th ACS Spring National Mtg, New Orleans, LA, Apr 2008: Electrospun metal nanoparticle-alginate based polymer blend nanofiber composites for biomedical applications (Carl Saquing)

235th ACS Spring National Mtg, New Orleans, LA, Apr 2008: Metal nanoparticles-loaded Al2O3 microtubes by atomic layer deposition on electrospun nanofiber templates (Carl Saquing)

235th ACS Spring National Mtg, New Orleans, LA, Apr 2008: High throughput electrospinning of polymer melts and concentrated solutions (Josh Manasco)

235th ACS Spring National Mtg, New Orleans, LA, Apr 2008: Hydrogels and Nanofibers from Enzymatically-modified Polysaccharides for Drug Delivery

NSF CMMI, Knoxville TN, Jan 2008: Preparation of Composites of Polymer Nanofibers and Silica Nanoparticles by Electrospinning for Lithium Ion Battery Applications (by Chris Bonino)
AIChE meeting, Salt Lake City Utah, Nov. 2007: Functional nanofibers from biomaterial complexes (by Stephanie Sullivan)

AIChE meeting, Salt Lake City Utah, Nov. 2007: Metal nanoparticle-polymer fiber nanocomposite processing via a novel one-step electrospinning (by Carl Saquing)

AIChE meeting, Salt Lake City Utah, Nov. 2007: Electrospun Nanofibers of Enzymatically-modified Polysaccharide for Drug Delivery (by Annie Chu)

Society of Rheology meeting, Salt Lake City, Utah Oct. 2007: Associative polymer facilitated electrospinning of nanofibers: role of viscoelasticity (by Sachin Talwar)
Lamb, H. Henry

Professor
B.S.  North Carolina State University
Ph.D.  University of Delaware

Interests:  Catalysis, biocatalysis, and surface science

2007-2008 Publications

Publications (Refereed)


Invited Presentations

“Recent Trends in Biopharmaceutical Manufacturing,” Campbell University, Buies Creek, NC; April 10, 2008.

Contributed Presentations


Lim, P. K.  
Professor  
B.S. Cornell University (1975)  
M.S. University of Illinois (1978)  
Ph.D. University of Illinois (1979)  

Professor  
B.S. Cornell University (1975)  
M.S. University of Illinois (1978)  
Ph.D. University of Illinois (1979)  

Interests: Kinetics, catalysis and reaction engineering; environmentally benign synthesis

2007-2008 Publications

Publications (Refereed)

Ollis, David F.

Distinguished Professor
(919) 515-2329
ollis@eos.ncsu.edu

B.S. California Institute of Technology (1963)
M.S. Northwestern University (1964)
Ph.D. Stanford University (1969)

Interests: Photochemical and Biochemical technology; First-year engineering

2007-2008 Publications

Publications (Refereed)

D. Ollis and A. Smith, Summer On-Site Immersion in French Language and Engineering, Proceedings ASEE 2008 Annual Conference (accepted)

D. Ollis, Technology Literacy as a Path to Engineering Solutions in a Global and Societal Context”, Proceedings ASEE 2008 Annual Conference (accepted)

J. Krupczak and D. Ollis, Technology Courses for Undergraduates: Developing Standard Models, Proceedings ASEE 2008 Annual Conference (accepted)


Parsons, Gregory N.  2032 EB1
Professor  (919) 515-753
Ph.D.  Physics, North Carolina State University (1990)
gregory_parsons@ncsu.edu

Interests:  Atomic layer deposition, including fundamental surface reactions and advanced applications; organic/inorganic materials and interfaces; physics of thin film devices.

2007-2008 Publications

Publications (Refereed)


Jeong-Seok Na, Jennifer Ayres, Kusum L Chandra, Christopher B Gorman and Gregory N Parsons “Real-time conductivity analysis through single-molecule electrical junctions” Nanotechnology 18, 424001 1-7 (2007).


Invited Presentations


Gregory N. Parsons “Nanotechnology Research at NC State University” Samsung Electronics, Suweon, Korea, Oct 31, 2007.

Contributed Presentations


Giovanna Scarel, G. Kevin Hyde, Daisuke Hojo, and Gregory N. Parsons “3D Atomic Layer Deposition: new physics and new metrology” NSF STC Center meeting, January 10, 2008.


G. Scarel, G.K. Hyde, and G.N. Parsons “Natural fibers coated by atomic layer deposition: study of soft matter interfaces with polar inorganic layers” ACS Colloids and Surface Science Symposium, Raleigh NC, June (2008)

Peretti, Steven  
Associate Professor  
B.S.  Yale University (1979)  
Ph.D.  California Institute of Technology (1987)  

Interests:  Biocatalysis, bioreactor dynamics, bioremediation, combinatorial molecular biology

2007-2008 Publications

Invited Presentations

“Value-Added Products from Biofuels Synthesis”,  
Rao, Balaji
Assistant Professor
B.S. University of Mumbai (1999)
Ph.D. Massachusetts Institute of Technology (2004)

**Interests:** Cell, Stem Cell, and Molecular Bioengineering; Therapeutic Protein Biotechnology

**2007-2008 Publications**

**Publications (Refereed)**


Spontak, Richard J.  
Professor  
B.S. Penn State University (1983)  
Ph.D. University of California at Berkeley (1988)  

Interests: Polymer science and engineering; morphology of nanostructured soft-condensed matter; molecular and nanoscale self-assembly; physical gels; electron microscopy techniques

2007-2008 Publications

Publications (Refereed)


In press (peer-reviewed)


Under review


**Invited Presentations**


"New Insights into, and Opportunities for, Microphase-Ordered Block Copolymers Containing Selective Solvents or Nanoparticles," Department of Polymer Science, University of Akron, OH, 2008.

"Molecular Design of Nanostructured Block Copolymers as a Route to High-Performance Electroelastomers," Liquid Crystal Institute, Kent State University, Kent, OH, 2008.

"Block Copolymers as a New Design Platform for High-Performance Electroactive Polymers," Department of Chemical Engineering, University of Rochester, Rochester, NY, 2007.


"Nanostructured Polymeric Membranes for Selective CO₂ Removal from Light Gas Mixtures" CO₂ Cooperative Research Center, Department of Chemical & Biomolecular Engineering, University of Melbourne, Melbourne, Australia, 2007.

"Modified Polymer Surfaces and Interfaces Using Block Copolymers and Microgel Particles," Polymer Science Group, Department of Chemical & Biomolecular Engineering, University of Melbourne, Melbourne, Australia, 2007.

"3D TEM Imaging of Nanostructured Polymer Systems," Centre for Material and Fibre Innovation, Deakin University, Geelong, Australia, 2007.

"New Opportunities for Block Copolymers: From Homologous Designer Molecules to Dynamic Multicomponent Systems," Department of Chemical & Biomolecular Engineering, University of Melbourne, Melbourne, Australia, 2007 [Tewkesbury Seminar].
Velev, Orlin D.
Associate Professor
M.Sc., University of Sofia, Bulgaria (1989)
Ph.D., University of Sofia, Bulgaria (1996)

Interests: Colloid science and nanoscale engineering. Assembly of microstructures with photonic, optical and electrical functionality. Chemical and biological sensors.

2007-2008 Publications

Publications (Referred)


Invited Presentations

Particles 2008 conference, Orlando, FL, May 2008 *(Plenary talk: Janus Particles - Unusual Properties and Use as Components of Complex Anisotropic Materials).*

Cabot Co., Boston, MA, March 2008 (Meniscus-Directed Assembly of Highly Structured Films, Lines and Self-Contained Clusters from Synthetic or Biological Particles).


Department of Mechanical Engineering, Arizona State University, February 2008 (On-chip Liquid and Particle Manipulation by AC Electric Fields: Applications in Microfluidics and Colloidal Assembly).

Department of Electrical Engineering, North Carolina State University, January 2008 (On-chip Liquid and Particle Manipulation by AC Electric Fields: Applications in Microfluidics, Bioassays and Colloidal Assembly).


MRS National Fall Meeting, Boston, November 2008 (Meniscus-Directed Assembly of Highly Structured Films, Lines and Self-Contained Clusters from Particles or Biomolecules).


Departments of Mathematics and Chemistry, Penn State University, State College, PA, October 2007 (On-chip droplet and particle manipulation by electric fields: Applications in microfluidics and colloidal assembly).

Department of Chemical Engineering, Auburn University, Auburn, AL, September 2007 (On-chip droplet and particle manipulation by electric fields: Application in microbioassays and microfluidic device).

DOW Chemicals, Midland, MI, September 2007 (Droplet-based colloidal engineering: Scalable and controllable processes for fabrication and manipulation of complex particles and capsules).
Cabot Co., Boston, MA, September 2007 (Classical colloids meet nanoscience: New classes of particulate stabilizers for foams, emulsions and microcapsules).

Syngenta Co., Greensboro, NC, August 2007 (Classical colloids meet nanoscience: New classes of particulate stabilizers for foams, emulsions and microcapsules).


**Contributed Presentations**


**Contributed research presentations by students, post-docs and collaborators**


Zing Conference in Microfluidics & Nanofluidics 2008, Cancun, Mexico, February 2008 (talk by Antonio Garcia).

AIChE Annual Conference, Salt Lake City, UT, November 2008 (2 talks by Carol Hall and Dimiter Petsev).

Surfactant and Colloid Group Workshop, Department of Chemistry, University of Hull, Hull, United Kingdom, September 2007 (2 talks by Sumit Gangwal and Vinayak Rastogi).
Emeritus Faculty

Beatty, Kenneth O.
R.J. Reynolds Professor Emeritus 919-515-6398
B.S., Lehigh University kobeatty@eos.ncsu.edu
M.S., Lehigh University
Ph.D., University of Michigan
Interests: Heat transfer, thermodynamics, biomedical engineering, fire cause and origin

Felder, Richard M. 2088D EB1
Hoechst Celanese Professor Emeritus 919-515-2327
B.Ch.E., City College of New York rmfelder@mindspring.com
M.S., Princeton University
Ph.D., Princeton University
Interests: Learning and teaching styles in engineering education, active and cooperative learning methods, engineering curriculum integration

Hopfenberg, Harold B. 1060 EB1
Camille Dreyfus Professor Emeritus 919-515-2318
S. B. Massachusetts Institute of Technology hbh@ncsu.edu
S. M. Massachusetts Institute of Technology
Ph.D. Massachusetts Institute of Technology
Interests: Transport and phenomena in polymeric materials applied to pharmaceutical formulations for sustained and controlled release.

Roberts, George W. 2100C EB1
Professor Emeritus 919-515-7328
groberts@ncsu.edu
B.S. Cornell University
Ph.D. Massachusetts Institute of Technology
Interests: Chemical reaction engineering, applied catalysis, chemical reactor analysis and design, pollution prevention and control, alternate fuels.

Winston, Hubert 2010C EB1
Associate Professor Emeritus 919-513-4474
B.S. North Carolina State University winston@ncsu.edu
M.S. North Carolina State University
Ph.D. North Carolina State University
Faculty Awards, Honors, and Distinctions

Lisa G. Bullard

2007 Joseph J. Martin Best Paper Award, Chemical Engineering Division, American Society for Engineering Education

2008 Winner of the NCSU Faculty Adviser Award

Lisa and Adam Melvin received the ASEE Graduate Studies Division 2008 Best Student Paper award for their paper, “Tips from the Trenches: Preparation and Implementation of an Experience-Based TA Training Session.”

Ruben Carbonell

Fellow, ACS Industrial and Engineering Chemistry Division, 2008

Richard Felder

2007 Joseph J. Martin Best Paper Award, Chemical Engineering Division, American Society for Engineering Education

Honorary Doctor of Science, State University of New York at Binghamton

Jan Genzer

NCSU Alumni Outstanding Research Award for 2006-2007

Fellow, American Physical Society

Feature article in the March 18 issue of Langmuir

Joseph DeSimone

Chancellor's Eminent Professor of Chemistry, University of North Carolina at Chapel Hill

William R. Kenan, Jr. Distinguished Professor of Chemical Engineering, North Carolina State University

2008 recipient of the Lemelson-MIT Prize

Selected as one of the AIChE's "One Hundred Engineers of the Modern Era."

Christine Grant

Professional Award in Chemical Engineering (2008), National Organization of Black Chemists and Chemical Engineers (NOBCChE)

Keith Gubbins

2007 ACS Joel Hildebrand Award in the Theory of Liquids


Peter Fedkiw

Appointed Guest professor Zhejiang University, China
Molecular Modelling 2007, Melbourne, Australia

Selected as one of the AIChE's "One Hundred Engineers of the Modern Era"

Carol K. Hall

Fellow, American Physical Society

Selected as one of the AIChE's "One Hundred Engineers of the Modern Era"

Jason Haugh

Alcoa Foundation Engineering Research Achievement Award for 2008

Wesley Henderson

Young Investigator (YIP) Awards, Army Research Office and Air Force Office of Scientific Research

Gregory Parsons

Alcoa Foundation Distinguished Engineering Research Award for 2008

Richard Spontak

Chemistry of Thermoplastic Elastomers Award, Rubber Division of the American Chemical Society

Ernst Ruska Prize, German Society for Electron Microscopy

2008 NCSU recipient of the UNC Board of Governors' Award for Excellence in Teaching

2007 Pennsylvania State University Outstanding Scholar Alumnus Award

Editorial Board Member, Langmuir (2008-2010)
# Courses Taught

## Fall 2007

<table>
<thead>
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<th>Course</th>
<th>Title/Instructor</th>
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<td>205-2</td>
<td>Chem Process Principles/Felder</td>
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## Summer Session I 2007

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## Spring 2008

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## Summer Session II 2007

No lecture courses were offered
Visitors and Staff

Seminars Presented in the Department 2007-2008

Fall 2007

August 27
“Modeling and Simulation of Semiflexible Polymers”
Simcha Srebnik
Department of Chemical Engineering
Technion – Israel Institute of Technology

September 10
“Charged, Water-Soluble Triblock Copolymers: Novel Micellization Phenomena and Steric Stabilization of Magnetite Nanoparticles for Biomedical Applications”
Richey Davis
Department of Chemical Engineering
Virginia Tech

September 24
“Solution-Processable Organic Conductors and Semiconductors: Viable Materials for Thin-Film Electronics”
Yueh-Lin (Lynn) Loo
Department of Chemical Engineering
University of Texas at Austin

October 1
“Mathematical Modeling of Intracellular Signaling Pathways”
Timothy Elston
Department of Pharmacology
The University of North Carolina – Chapel Hill

October 8
“Engineering Strategies for Mimicking the Blood-Brain Barrier in Vitro”
Eric Shusta
Department of Chemical and Biological Engineering
University of Wisconsin

October 15
“Reaction Engineering Classics in Systems Biotechnology”
Wei-Shou Hu
Chemical Engineering & Materials Science
University of Minnesota

October 22
“Dripping, Jetting, Drops and Wetting” the Magic of Microfluidics”
David A. Weitz
Department of Physics
Harvard University

October 29
“Gas Separation Using Ionic Liquids and Polymers”
Richard A. Noble
Chemical and Biological Engineering
University of Colorado at Boulder

November 12
“Degradation of Polymer Electrolyte Fuel Cells”
Thomas Zawodzinski
Chemical Engineering
Case Western Reserve University

November 19
“Ionic Conductivity in Block Copolymer Electrolytes for Lithium Batteries”
Nitash Balsara
Department of Chemical Engineering
University of California, Berkeley

December 3
“Engineering when Nanometers Count: Examples from Oxide Heteroepitaxy on Si(100) and Tunneling Devices for Molecular Electronics”
Brian Willis
Chemical Engineering
University of Delaware

Spring 2008

January 14
“Understanding and Tuning Protein Translocation through the Ribosome”
Lydia Contreras
Chemical Engineering Department
Cornell University
January 23
“Molecular Memory Circuits on a Nanoscale”
Amy S. Blum
Center for Bio/Molecular Science and Engineering
Naval Research Laboratory, Washington, DC

January 28
“Nanoscale Self-Assembly via Electrostatic Interactions”
Kyle J. M. Bishop
Chemical & Biological Engineering
Northwestern University

February 4
“The Effect of Chain Rigidity on the Self-Assembly of Functional Block Copolymers”
Bradley D. Olsen
Chemical Engineering
University of California, Berkeley

February 11
“New Concepts in Interfacial Engineering: Arresting Self Assembly and Motility-Based Sorting of Mammalian Cells”
Carlos Co
Chemical & Materials Engineering
University of Cincinnati

February 18
“Phase Equilibria of Hydrofluorocarbons in Ionic Liquids”
Mark B. Shiflett
DuPont Central Research and Development
Wilmington, Delaware

February 25
Alejandro L. Briseno
Department of Chemistry
University of Washington

February 27
“Interfacial Dynamics of Polymers and SAMs: Glassy Dynamics, Hierarchical Assembly and the Quest for Perfection”
Steven J. Sibener
The James Franck Institute and Department of Chemistry
University of Chicago

March 10
“Quantifying Phenotype in Dynamic Metabolic Networks Using 13C Tracers and Comprehensive Flux Analysis”
Jamey D. Young
Department of Chemical Engineering
Massachusetts Institute of Technology

March 12
“Deducing Transcriptional Regulatory Features from Transcriptome Data”
Mark P. Brynildsen
Chemical and Biomolecular Engineering
University of California, Los Angeles (UCLA)

March 17
“Nanoconfinement Effects on Glass Formation and Glassy Behavior of Polymers”
Rodney D. Priestley
Department of Chemical and Biological Engineering
Northwestern University

March 19
“Benign Synthesis, Size Control and Assembly of Silica Nanoparticles: A New Paradigm for Dispersed Particle, Porous Thin Film, and Gel Applications’
Mark Snyder
Chemical Engineering and Materials Science
University of Minnesota

March 24
“Characterization and Engineering of Bacterial Protein Translocation Systems”
Danielle Tullman-Ercek
Department of Pharmaceutical Chemistry
University of California – San Francisco

April 14
“Quantitative Systems Analysis of Multicellular Morphodynamics”
Anand Asthagiri
Chemical Engineering
California Institute of Technology

April 28
McCabe Lecturer
“Third Way Innovators to the Rescue!”
James A. Trainham
Science & Technology
PPG Industries, Inc.
Visiting Researchers

Mr. Michele Brushi            Dr. Eiji Funai            Dr. Yang-Il Huh
Dr. C. K. Lee                Dr. Jeronimo Merino        Dr. Smoukov Stoyan
Ms. Valentina Villa          Dr. Xuedong Wei

Post-Doctoral Researchers

Ketan Bhatt                  Sara Blumer-Schuette         Mookyung Cheon
Evan Griffing                Liping Huang                Yazan Hussain
Michael Kelly                Sejong Kim                 Yingchun Liu
Sang Oh                      Elie Paillard              Thomas Roussel
Carl Saquing                 Giavanna Scarel            Archana Trivedi

Staff

Ms. Sandra Bailey
Ms. Saundra Doby
Ms. Angela Efimenko
Ms. Diane Harper
Ms. Sheila Hayes
Ms. Gwendolyn Johnson
Ms. Shirley Kow
Dr. Jeng Leng
Ms. June McKoy
Dr. Russ O'Dell
Ms. Janet Schumacher
Ms. Alison Stieglitz
Ms. Rajani Verghese
Ms. Clarice Whitmarsh
Mr. Kit Yeung
Research Sponsors

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CFD Research Corporation
Coats North America
Dade-Behring
Dairy Management Inc.
DARPA
Department of Education
Department of Energy
Dupont
Eaton Corporation
Golden LEAF Foundation
INEST/Quantum Resources Corp.
International Society for Pharmaceutical Engineering
Juvenile Diabetes Research Foundation
Kenan Center for the Utilization of Carbon Dioxide in Manufacturing
Liquidia Technologies, Inc

Massachusetts Institute of Technology
MeadWestvaco
Mitchell Kapor Foundation
National Institute of Standards & Technology
National Academies – Keck Futures Initiative
National Institutes of Health
National Science Foundation
NC Department of Transportation
NC Biotechnology Center
NC State Engineering Dean’s Office Undergraduate Research Funds
NC State Faculty Research and Professional Development
NC State Nonwovens Cooperative Research Center
NC State University Extension Grant Program
Norwegian Research Council
Novozymes
NSF Science and Technology Center for Environmentally Responsible Solvents and Processes
Phillip Morris USA
Project SUCCEED
Rensselaer Polytechnic Institute
RTI International
Semiconductor Research Corporation
Siemens, Inc.
SINTEFF
Syngenta
Unilever
UNC – General Administration
UNC - Office of the President
UNC Cancer Research Fund
University of Colorado
University of Minnesota
University of Virginia (US Dept. of Health)
US Air Force Office of Scientific Research
US Department of Agriculture
US Navy - Office of Naval Research
United Resource Recovery Corp.