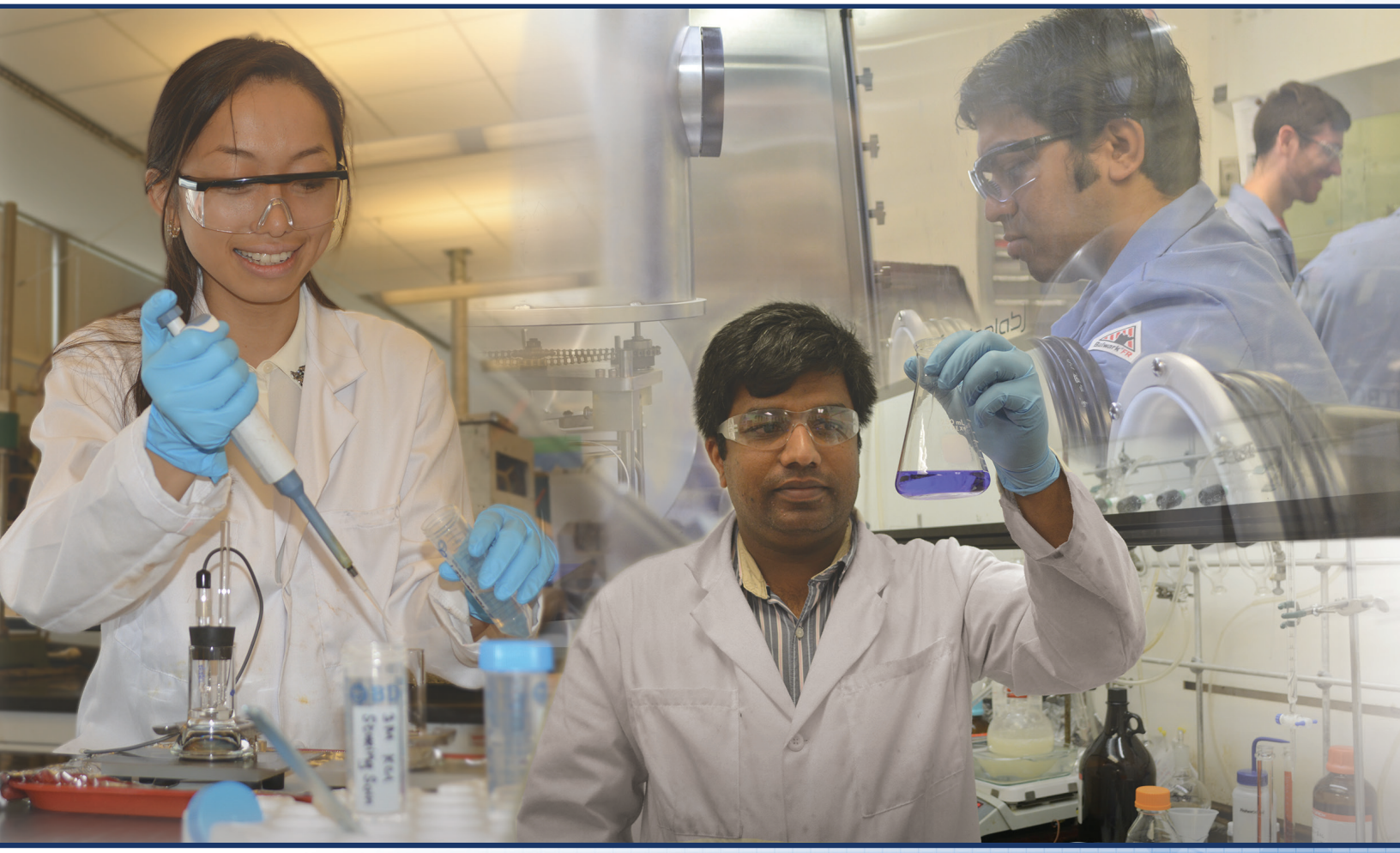
DREXEL UNIVERSITY

The Department of Chemical & Biological Engineering

GRADUATE STUDIES



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DREXEL UNIVERSITY
Chemical and Biological Engineering
College of Engineering

14
Full-Time Tenure-Track/
Tenured Professors

39
Ph.D Students

8
Masters Students

450
Undergraduate Students

$2.5 Million
Research Expenditures in 2014

73
Active Grants

GRADUATE PROGRAMS:

Ph.D. & M.S. Degrees in Chemical Engineering

FUNDING YOUR EDUCATION

All Full-Time PhD Students Admitted
Receive:

A Monthly Stipend
100 Percent Tuition Payment
Optional Insurance Plan

GRADUATE FELLOWSHIPS AVAILABLE

GAANN Fellowships
George Hill, Jr. Fellowships
Koerner Family Fellowships
The Harry Brown, Jr. Fellowships
The Leroy Resser Fellowship Fund
Graduate Scholarships

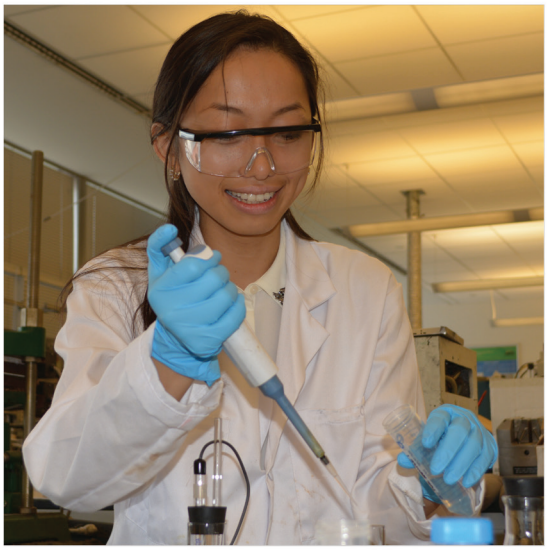
GRADUATE RESEARCH PROGRAM

DRUG DELIVERY | FUEL CELLS | SOLAR CELLS | POLYMERS
MOLECULAR SIMULATIONS | BIOMATERIALS | BIOSENSORS | NANOTECHNOLOGY

The Department of Chemical and Biological Engineering at Drexel University consists of 14 tenured and tenure-track faculty members, 2 teaching faculty, 39 PhD students and 450 undergraduate students. We are currently engaged in externally funded research with over $2.5 million in annual research expenditures using state-of-the-art facilities. Our research program is built upon the following areas of core competency: (a) chemical kinetics, transport, and thermodynamics (b) polymer science and engineering and (c) systems engineering, modeling and computation. These competencies support our research themes of Energy and Sustainability and Health and Medicine which are directly linked to solving present-day societal challenges. Funding sources for our research include NSF, NIH, ARO, AFOSR, ONR, DOE, USDA, EPA and NASA. Recently, we were awarded a three-year $4 million Center for Sustainable Corrosion Protection by the Army Research Laboratory, and we are an Army Materials Center of Excellence for polymers research. Additionally, our faculty have received multiple young investigator awards, including 7 CAREER Awards and 1 PECASE award.

BIOLOGICAL ENGINEERING

DRUG DELIVERY | BIOSENSORS | BIOCHEMICAL ENGINEERING | BIOMATERIALS | BIOLOGICAL COLLOIDS | TISSUE ENGINEERING | CELLULAR METABOLISM



FACULTY RESEARCH INTERESTS:

Cameron Abrams
Biomolecular simulations
HIV structural biology and inhibitor design

Nily Dan
Biological colloids
Biomembranes
Drug delivery systems

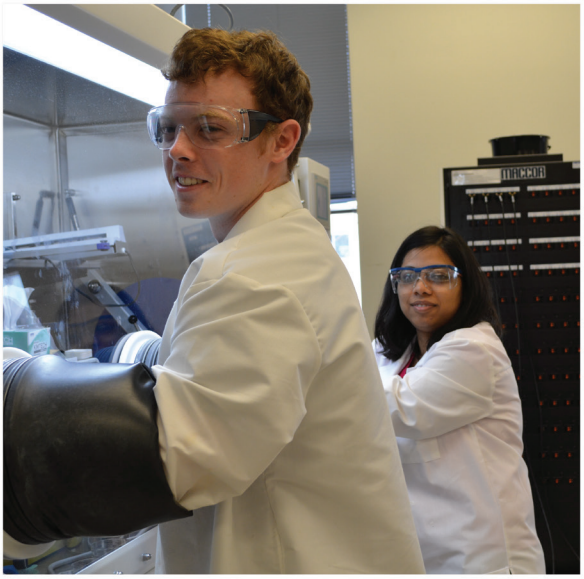
Steven Wrenn
Biomedical colloids
Biological membranes
Ultrasound with colloids, membranes, and cells

Raj Mutharasan
Biomolecular binding and interactions
Biosensors
Bioprocess Engineering

ENERGY & THE ENVIRONMENT ENGINEERING

SOLAR CELLS | NANOWIRES | BIODEGRADABLE POLYMERS | RENEWABLE FUELS & ENERGY | FUEL CELLS | ELECTROCATALYSTS | POLYMERS & COMPOSITES FROM RENEWABLE SOURCES | DESALINATION MEMBRANES

FACULTY RESEARCH INTERESTS:



Nicolas Alvarez
Aqueous lubrication
Fracking fluids

Jason Baxter
Solar cells
Semiconductors
Ultrafast spectroscopy

Richard Cairncross
Biodegradable polymers
Renewable fuels and energy
Biodiesel production

Aaron Fafarman
Solar cells
Colloidal nanocrystals
Self-assembly of materials

Vibha Kalra
Electrodes for energy devices
Batteries, supercapacitors
Fuel cells, solar cells

Kenneth Lau
Polymer electrolytes
Conducting polymers
Solar cells, supercapacitors, batteries

Giuseppe Palmese
Renewable polymeric materials
Renewable sources

Joshua Snyder
Corrosion: dealloying
Electrocatalysis
Gas to liquid fuels

Masoud Soroush
Fuel cells, solar cells, rechargeable batteries
Desalination membranes

Maureen Tang
Batteries and fuel cells
Electrocatalysis
Electrochemical engineering

MULTISCALE MODELING & PROCESS SYSTEMS ENGINEERING

PROCESS CONTROL AND MODELING | TRANSPORT PHENOMENA | MOLECULAR SIMULATIONS | BIOPHYSICS | COMPLEX FLUIDS

FACULTY RESEARCH INTERESTS:

Cameron Abrams
Multiscale molecular simulations
Free-energy methods

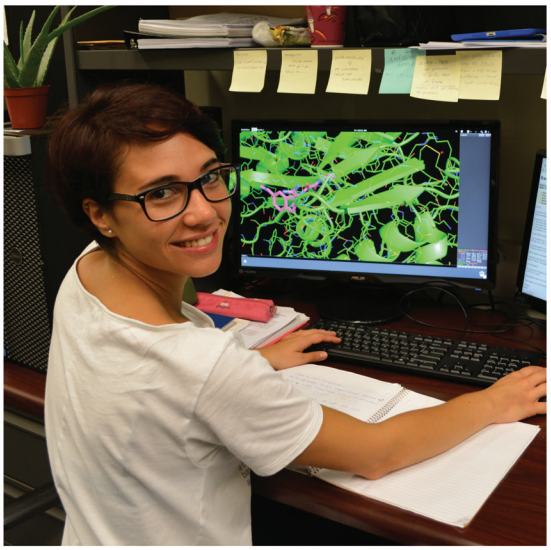
Richard Cairncross
Transport modelings

Nily Dan
Complex fluids
Gene and drug delivery

Vibha Kalra
Molecular/meso-scale simulations
Self assembling nano-scale materials

Masoud Soroush
Multiscale modeling
Probabilistic modeling and inference
Control and optimization

Maureen Tang
Electrochemical engineering



POLYMER SCIENCE & ENGINEERING

MEMBRANES | COMPOSITES | REACTING POLYMER SYSTEMS | POLYMER PROCESSING & RHEOLOGY | NANOCOMPOSITES | INTERFACIAL PHENOMENA | DIFFUSION IN POLYMERS | POLYMER THERMODYNAMICS

FACULTY RESEARCH INTERESTS:

Cameron Abrams
Polymer physics and molecular simulations
Thermosetting polymers and composites

Nicolas Alvarez
Polymer extensional rheology

Richard Cairncross
Transport in polymers
Biodegradable polymers
Coatings

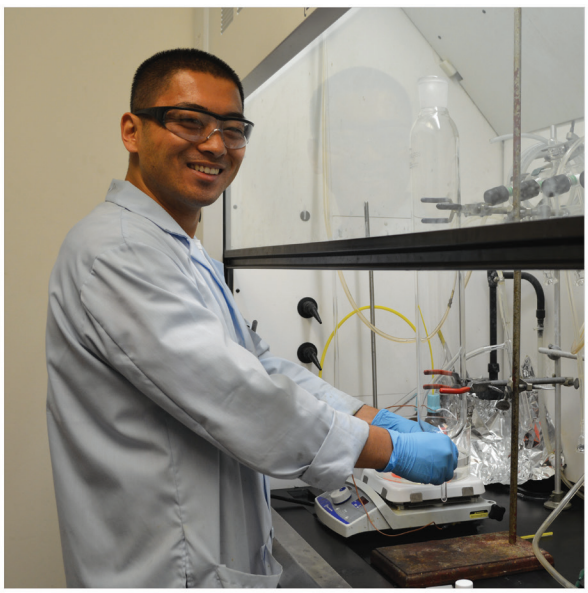
Nily Dan
Polymers nanocomposites

Vibha Kalra
Self assembling polymers
Organic/inorganic hybrids

Kenneth Lau
Polymer thin films/devices
Chemical vapor deposition
Surface engineering

Giuseppe Palmese
Reacting polymer systems
Nanostructure polymers
Materials from renewable sources
Composites and interfaces

Masoud Soroush
Reactor optimization & control
Polymer reaction engineering
Computational quantum chemistry



FACULTY PROFILES

CAMERON ABRAMS
Professor

Degrees

PhD, Chemical Engineering, University of California, Berkeley, 2000
BS, Chemical Engineering, North Carolina State University, 1995

Selected Awards

College of Engineering Excellence in Research Award, 2014
NSF CAREER Award, 2006
Office of Naval Research Young Investigator, 2003

Research Interests

Molecular simulations in biophysics and materials
HIV-1 envelope structure and function
Protein-ligand binding thermodynamics and kinetics

Selected Publications

Bucci, A; Abrams, C.F. Oxygen pathways and allostery in monomeric sarcosine oxidase via single-sweep free-energy reconstruction. *J. Chem. Theory Comput.* 2014, 10, 2668-2676.

Baker, M.K.; Gangupomu, V.; Abrams, C.F. Characterization of the water defect at the HIV-1 gp41 membrane spanning domain in bilayers with and without cholesterol using molecular simulations. *Biochim. Biophys. Acta Biomembr.* 2014, 1838, 1396-1405.

Abrams, C.F.; Vanden-Eijnden, E. Large-scale conformational sampling of proteins using temperature-accelerated molecular dynamics. *Proc. Natl. Acad. Sci. USA* 2010, 107, 4961-4966.

NICOLAS ALVAREZ
Assistant Professor

Degrees

PhD, Chemical Engineering, Carnegie Mellon University, 2011
BS, Chemical Engineering, University of Florida, 2006

Selected Awards

AIChE Fluid Dynamics (01J) First Place Postdoctoral Award, 2012
The Ken Meyer Award for Excellence in Graduate Research, 2011
AIChE Fluid Dynamics (01J) First Place Graduate Poster Award, 2010
Geoffrey D. Parfitt Memorial Award, 2010
Mark Dennis Karl Outstanding Graduate Teaching Award, 2010
NSF Graduate Research Fellowship, 2006

Research Interests

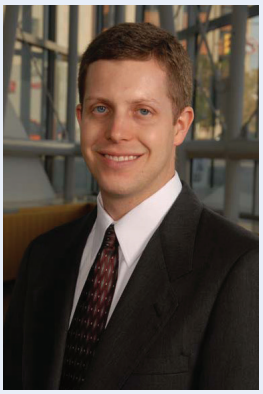
Photonic crystal defect chromatography
Extensional rheology of polymer/polymer composites
Surfactant/polymer transport to fluid and solid interfaces
Aqueous lubrication
Interfacial instabilities

Selected Publications

Alvarez, N.J.; Marin, J.M.R.; Huang, Q.; Hassager, O. Creep measurements confirm existence of steady state after maximum in extension of branched polymers. *PRL* 2013, 110(16), 168301.

Alvarez, N.J.; Walker, L. M.; Anna, S.L. Diffusion-limited adsorption to a spherical geometry: the impact of curvature and competitive timescales. *Physical Review E* 2010, 82, (1). Highlighted: Virtual Journal of Nanoscale Science and Technology, August 2, 2010.

Huang, Q.; Alvarez, N.J.; Matsumiya, Y.; Rasmussen, H.K.; Watanabe, H.; Hassager, O. Extensional rheology of entangled polystyrene solutions suggests importance of nematic interactions. *ACS Macro Letters* 2013, 2(8), 741-744.



JASON BAXTER
Associate Professor

Degrees

PhD, Chemical Engineering, University of California, Santa Barbara, 2005
BS, Chemical Engineering, University of Delaware, 2000

Selected Awards

NSF CAREER Award, 2009
ACS PRF Alternative Energy Postdoctoral Fellowship, 2005
NSF Graduate Research Fellowship, 2001

Research Interests

Solar cells
Semiconductor and oxides
Ultrafast spectroscopy

Selected Publications

Guglietta, G.W.; Roy Choudhury, K.; Caspar J.V.; Baxter, J.B. Employing time-resolved terahertz spectroscopy to analyze carrier dynamics in thin-film $Cu_2ZnZn(S,Se)_4$ absorber layers. *Appl. Phys. Lett.* 2014, 104, 253901.

Smolin, S.Y.; Scafetta, M.D.; Guglietta, G.W.; Baxter J.B.; May, S.J. Ultrafast transient reflectance of epitaxial semiconducting perovskite thin films. *Appl. Phys. Lett.* 2014, 105, 022103.

McPeak, K.M.; Opasanont, B.; Shibata, T.; Ko, D.-K.; Becker, M.A.; Chattopadhyay, S.; Bui, H.P.; Beebe, T.P.; Bunker, B.A.; Murray, C.B.; Baxter, J.B. Microreactor chemical bath deposition of laterally graded $Cd_{1-x}Zn_xS$ thin films: A route to high-throughput optimization for photovoltaic buffer layers. *Chem. Mater.* 2013, 25, 297.

RICHARD CAIRNCROSS
Associate Professor

Degrees

PhD, Chemical Engineering, University of Minnesota, 1994
BS, Chemical Engineering, University of Rochester, 1989

Selected Awards

Fulbright Lectureship at University of El Salvador, 2010
L.E. Scriven Young Investigator Award, 2006
PECASE Award, 1996

Research Interests

Biodiesel production
Sustainability
Waste to energy systems
Biodegradable polymers and composites

Selected Publications

Stacy, C.J. ;Melick, C.A.; Mohammed, M.; Cairncross, R.A. Esterification of free fatty acids to fatty acid alkyl esters in a bubble column reactor for use as biodiesel. *Fuel Processing Technology* 2014, 124, 70-77.

Dever, D.; Cairncross R.A.; Elabd Y.A. Nanofiber cathode catalyst layer model for a proton exchange membrane fuel cell. *Journal of Fuel Cell Science and Technology* 2014, 11, 041007.

Wong, W.K.; Cheng, S.; Li, C.Y.; Ahmad I.; Cairncross, R.A.; Hsuan, Y. Depletion mechanism of antioxidants in MDPE-clay nanocomposites under thermal aging. *Polymer Degradation and Stability* 2012, 97(2) 192-199.

NILY DAN
Associate Professor

Degrees

PhD, Chemical Engineering, University of Minnesota, 1992
BS, Chemical Engineering, Technion IIT, Israel, 1987

Selected Awards

NSF-BIO/DBI Service Appreciation, 2009-2010
Visiting Scholar, DEAS Harvard University, 2006
NSF Young Investigator CAREER Award, 1999

Research Interests

Self assembly in amphiphilic and polymeric systems
Controlled drug release from polymer-based carriers

Selected Publications

Rosenberg, R.T.; Dan, N. Designing nano-particle colloidal shells for selective transport. *Soft Materials* 2013, 11, 143-148.

Wrenn, S.P.; Small, E.; Dan, N. Bubble nucleation in lipid bilayers: A mechanism for Low Frequency UltraSound disruption. *BBA* 2013, 1828, 1192-1197.

Zhao, Y.; Dan, N.; Pan, Y.J.; Nitin, N.; Tikekar, R.V. Enhancing the barrier properties of colloidosomes using silica nanoparticle aggregates. *J. Food Eng*. 2013, 421-425.

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AARON FAFARMAN
Assistant Professor

Degrees

PhD, Physical Chemistry, Stanford University, 2010
BS, Chemistry, University of California, Berkeley, 2000

Selected Awards

Annual Prize in Physical Chemistry, Stanford University, 2010
Linus Pauling Chemistry Teaching Award, Stanford University, 2010

Research Interests

Photovoltaic energy conversion
Solution-based synthesis of semiconductor thin films
Colloidal nanocrystals
Electromodulation and photomodulation spectroscopy

Selected Publications

Kim, D. K.; Fafarman, A.T.; Diroll, B.T.; Chan, S.H.*; Gordon, T.R.; Murray, C.B.; Kagan, C.R. Solution-based stoichiometric control over carrier statistics in nanocrystalline CdSe devices. *ACS Nano* 2013, 8760–8770.

Fafarman, A.T.; Hong, S.-H.; Caglayan, H.; Ye, X.; Diroll, B.T.; Paik, T.; Engheta, N.; Murray, C.B.; Kagan, C.R. Chemically tailored dielectric-to-metal transition for the design of metamaterials from nanoimprinted colloidal nanocrystals. *Nano Lett.* 2013, 13, 350–357.

Fafarman, A.T.; et al. Thiocyanate- capped nanocrystal colloids: vibrational reporter of surface chemistry and solution- based route to enhanced coupling in nanocrystal solids. *J. Am. Chem. Soc.* 2011, 133, 15753–15761.

FACULTY PROFILES

VIBHA KALRA
Assistant Professor

Degrees

PhD, Chemical and Biomolecular Engineering, Cornell University, 2009
BS, Chemical Engineering, Indian Institute of Technology (IIT), Delhi, India, 2004

Selected Awards

ONR Summer Faculty Fellowship Award, 2013
NSF CAREER Award, 2012
Faculty Career Development Award, Drexel University, 2011
Austin Hooey Research Excellence Award, Cornell University, 2009

Research Interests

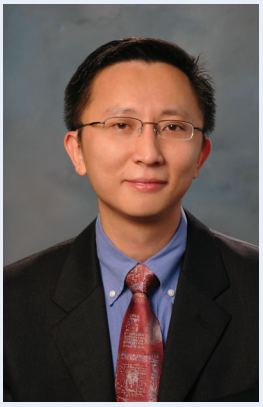
Electrodes for energy storage and conversion
Supercapacitors, Li-S/0_2 batteries, fuel cells, flow batteries
Electrospinning of nanofibers
Molecular dynamics simulations

Selected Publications

Tran, C.; Kalra, V. Fabrication of porous carbon nanofibers with adjustable pore sizes as electrodes for supercapacitors. *J Power Sources* 2013, 235, 289.

Tran, C.; Kalra, V. Molecular dynamics study on effect of elongational flow on morphology of immiscible mixtures. *J. Chem. Phys.* 2014, 140, 134902.

Mayrhuber, I.; Dennison, C.R.; Kalra, V.; Kumbur, E.C. Laser-perforated carbon paper electrodes for improved mass-transport in high power density vanadium redox flow batteries. *J. Power Sources* 2014, DOI: 10.1016/j.jpowsour.2014.03.007.



KENNETH LAU
Associate Professor

Degrees

PhD, Chemical Engineering, Massachusetts Institute of Technology, 2000
BEng(Chem), National University of Singapore, 1995

Selected Awards

Sabbatical Leave Award, 2013 (HKUST)
NSF CAREER Award, 2008
ACS PRF New Investigator Award, 2008

Research Interests

Polymer thin films and devices
Energy capture (solar cells)
Energy storage (supercapacitors, batteries)
Surface engineering (superhydrophobicity, superhydrophilicity)

Selected Publications

Nejati, S.; Minford, T.E.; Smolin, Y.Y.; Lau, K.K.S. Enhanced charge storage of ultrathin polythiophene films within porous nanostructures. *ACS Nano* 2014, 8, 5413–5422.

Bose, R.K.; Nejati, S.; Stufflet, D.R.; Lau, K.K.S. Graft polymerization of anti-fouling PEO surfaces by liquid-free initiated chemical vapor deposition. *Macromolecules* 2012, 45, 6915-6922.

Nejati, S.; Lau, K.K.S. Pore filling of nanostructured electrodes in dye sensitized solar cells by initiated chemical vapor deposition. *Nano Letters* 2011, 11, 419-423.

RAJ MUTHARASAN
Frank A. Fletcher Professor

Degrees

PhD, Chemical Engineering, Drexel University, 1973
MS, Chemical Engineering, Drexel University, 1971
BS, Chemical Engineering, IIT (Madras, India), 1969

Selected Awards

Fellow of The American Association for the Advancement of Science, 2011
Fellow of the American institute for Medical and Biological Engineering, 2006
Fellow of the American Institute of Chemical Engineers, 2002
Editorial board of Applied Biochemistry and Biotechnology

Research Interests

Cantilever sensors for biological detection
Modeling of resonance
Dynamics of fluid-solid interactions
Mechanics and related phenomena in biological binding and interaction

Selected Publications

Johnson, B.; Mutharasan, R. A cantilever biosensor-based assay for toxin-producing cyanobacteria microcystis aeruginosa using 16S rRNA. *Envir Sci Tech* 2013, 47 (21), 12333–12341.

Johnson, B.N.; Mutharasan, R. Electrochemical piezoelectric-excited millimeter-sized cantilever (ePEMC) for simultaneous dual transduction biosensing. *Analyst* 2013, 138 (21), 6365 - 6371.

Sharma, H.; Mutharasan R. hlyA gene-based sensitive detection of *Listeria monocytogenes* using a novel cantilever sensor. *Anal. Chem.* 2013, 85(6), 3222-3228.

GIUSEPPE PALMESE
Professor and Department Head

Degrees

PhD, Chemical Engineering, University of Delaware, 1992
BS, Chemical Engineering, Princeton University, 1986

Selected Awards

Army Materials Center for Excellence, 2006-2014
TTCP Technical Program Achievement Award, 2007
SERDP Best Project Award, 2005

Research Interests

Thermosetting polymers and biomaterials
Composites and interfaces
Processing-structure-property relationships

Selected Publications

Sharifi, M; Jang, C.W.; Abrams, C.F.; Palmese, G.R. Toughened epoxy polymers via rearrangement of network topology. *J. Mater. Chem.* 2014, DOI: 10.1039/C4TA03051F.

Hu F.; La Scala J.J.; Sadler J.M.; Palmese G.R. Synthesis and characterization of thermosetting furan-based epoxy systems, *Macromolecules* 2014, 47, 3332-3342.

Peterson, A.M.; Jensen, R.E.; Palmese, G.R. Kinetic considerations for strength recovery at the fiber–matrix interface based on the Diels–Alder Reaction. *ACS Appl. Mater. Interfaces* 2013, 5(3), 815-821.

JOSHUA SNYDER
Assistant Professor

Degrees

B.S. Chemical Engineering, Drexel University, 2006
M.S. Chemical Engineering, Drexel University, 2006
Ph.D. Chemical Engineering, Johns Hopkins University, 2012

Selected Awards

Director's Postdoctoral Fellowship Award, Argonne National Lab, 2012
Poster Award: 1st Place, ECS Meeting, 2008
Poster Award: 2nd Place Materials Science Division, AIChE Meeting, 2007
Undergraduate Student Research Award, Drexel University, 2006

Research Interests

Electrocatalysis (energy conversion/storage)
Heterogeneous catalysis
Corrosion (dealloying, nanoporous metals)
Colloidal synthesis
Interfacial electrochemical phenomena in nanostructured materials

Selected Publications

Snyder, J.; Livi, K.; Erlebacher, J. Oxygen reduction reaction performance of [MTBD][beti]-encapsulated nanoporous NiPt alloy nanoparticles. *Advanced Functional Materials* 2013, 23, 5494-5501.

Snyder, J.; McCue, I.; Livi, K.; Erlebacher, J. Structure/Processing/Properties relationships in nanoporous nanoparticles as applied to catalysis of the cathodic oxygen reduction reaction. *Journal of the American Chemical Society* 2012, 134, 8633-8645.

Snyder, J.; Fujita, T.; Chen, M.W.; Erlebacher, J. Oxygen reduction in nanoporous metal/ionic liquid composite electrocatalysts. *Nature Materials* 2010, 9, 904-907.

MASOUD SOROUSH
Professor

Degrees

Ph.D, Chemical Engineering, University of Michigan, 1992
MSE, Electrical Engineering: Systems, University of Michigan, 1991
MSE, Chemical Engineering, University of Michigan, 1988
BS, Chemical Engineering, Abadan Institute of Technology, Iran, 1985

Selected Awards

Faculty Achievement Award for Excellence in Teaching, Drexel University, 1999
O. Hugo Schuck Best Paper Award, AACC, 1999
NSF Faculty Early CAREER Award, 1997

Research Interests

Polymerization reaction engineering
Process systems engineering
Solar cells, fuel cells and power storage systems
Probabilistic risk assessment and mitigation

Selected Publications

Mohseni Ahooyi, T.; Arbogast, J.E.; Oktem, U.; Seider, W.D.; Soroush, M. Maximum-likelihood maximum-entropy estimation of multivariate probability density functions. *AIChE Journal* 2014, 60(3), 1013(1026).

Liu, S.; Srinivasan, S.; Grady, M.C.; Soroush, M.; Rappe, A.M. Backbiting and b-scission reactions in free-radical polymerization of methyl acrylate. *Int. J. of Quantum Chemistry* 2014, 114(5), 345-360.

Bavarian, M.; Najati, S.; Lee, D.; Lau, K.K.H.; Soroush, M. Theoretical and experimental study of a dye sensitized solar cell. *Industrial & Eng. Chem. Research* 2014, 53(13), 5234-5247.

FACULTY PROFILES

MAUREEN TANG
Assistant Professor

Degrees

Ph. D. Chemical Engineering, University of California, Berkeley, 2012
B.S. Chemical Engineering, Carnegie Mellon University, 2007

Selected Awards

Electrochemical Society Daniel Cubiciotti Student Award, 2011
NSF East Asia Pacific Summer Institute Fellowship, 2011
National Science Foundation Graduate Research Fellowship, 2007-2010

Research Interests

Electrochemistry (batteries, fuel cells, electrolyzers)
Catalysis and surface science

Selected Publications

Tang, M.; Hahn, C.; Klobuchar, A.; Ng, J.W. D.; Wellendorff, J.; Bligaard, T.; Jaramillo, T.F. Nickel-silver alloy electrocatalysts for hydrogen evolution and oxidation in alkaline electrolyte. *Phys. Chem. Chem. Phys.* 2014, 16, 19250.

Tang, M.; Newman, J. Electrochemical characterization of SEI-type passivating films using redox shuttles. *J. Electrochem. Soc.* 2011, 158 (5), A530-A536.

Tang, M.; Albertus, P.; Newman, J. Two-dimensional modeling of lithium deposition during cell charging. *J. Electrochem. Soc.* 2009, 156 (5), A390-A399.

STEVEN WRENN
Associate Professor

Degrees

PhD, Chemical Engineering, University of Delaware, 1999
MChE, Chemical Engineering, University of Delaware, 1996
BS, Chemical Engineering, Virginia Tech, 1991

Selected Awards

Cooperative Education Faculty of the Year, 2012
Alexander von Humboldt Research Fellow, 2006
NSF CAREER Award, 2004
Whitaker Foundation Biomedical Engineering Research Grant, 2001

Research Interests

Ultrasound-triggered drug delivery
Biological colloids and membranes
Atherosclerosis and gallstone pathogenesis

Selected Publications

Nguyen, A.; Wrenn, S. Acoustically active liposome-nanobubble complexes for enhanced ultrasonic imaging and ultrasound-triggered drug delivery. *WIRES Nanomedicine and Nanobiotechnology* 2014, 6, 316 – 325.

Dicker, S.; Mleczko, M.; Siepmann, M.; Wallace, N.; Youhan S.; Bawiec, C.; Schmitz, G.; Lewin, P.; Wrenn, S. Influence of shell composition on the resonance frequency of microbubble contrast agents. *Ultrasound in Medicine and Biology* 2013, 39(7), 1292 – 1302.

Wrenn, S.; Dicker, S.; Small, E.; Dan, N.; Mleczko, M.; Schmitz, G.; Lewin, P. Bursting bubbles and bilayers. *Theranostics* 2012, 2(12), 1140 - 1159.

DREXEL UNIVERSITY

Philadelphia financier and philanthropist Anthony J. Drexel, mentor of J.P. Morgan, founded Drexel University in 1891. Today, Drexel University is a top-tier comprehensive research university ranked in the top 100 of American's Best National Universitites by US News and World Report. Recently, Drexel has been acknowledged for the most promising and innovative changes in academics, faculty, students, campus, and facilities, in the nation. Drexel is widely recognized for its focus on experimental learning through its cooperative education program, technology and translational research. Drexel University enrolls more than 22,000 students, is the nation's 14th largest private university, and has the largest private college of engineering in the nation.

CONTACT INFORMATION:

For more information about the graduate program in Chemical Engineering at Drexel University, contact us at:
www.drexel.edu/cbe/contact/contact-us/

ADMISSIONS INFORMATION:

Graduate Admissions:
www.drexel.edu/grad/

Apply online:
www.drexel.edu/grad/apply/online-app/

DREXEL'S ADMISSION REQUIREMENTS:

Acceptance to graduate study requires:

A-four-year bachelor's degree from an accredited institution in the United States or an equivalent international institution.

A minimum cumulative grade point average of 3.0 (B) for the last two years of undergraduate work. The average for any graduate work must be at least 3.0.

Applicants for post-master's status must show potential for further study by having maintained at least a 3.0 average in their master's level studies.

The admission committee evaluates all credentials submitted by applicants to determine a strudent's ability and potential to contribute to his/her program of study and to the University community as a whole.

Drexel University is located in the heart of Philadelphia, the 6th largest city in the United States. Philadelphia is vibrant city that has the second-largest student concentration on the East Coast with over 420,000 college and university students enrolled in the greater metropolitan area. Philadelphia is a culturally rich city boasting some of the country's best museums, restaurants, orchestra, sports teams, tourist attractions, parks, hospitals, and cultural events.

>> drexel.edu/cbe