

Dr. Eva Marand

Department of Chemical Engineering
128 Randolph Hall (0211)
Blacksburg, VA 24061
Phone: (540) 231-8231; Fax: (540) 231-5022; Email: emarand@vt.edu

Composite membranes based on zeolite-polymer mixed matrix systems.

Dr. Herve Marand

Department of Chemistry
301-E Davidson Hall (0212)
Blacksburg, VA 24061
Phone: (540) 231-8227; Fax: (540) 231-3255; Email: hmarand@vt.edu

Studies of polymer crystallization, melting, liquid-liquid phase separation, morphology, viscoelastic and optical properties using calorimetry, dilatometry, wide angle X-ray diffraction, small angle X-ray scattering, small angle light scattering, optical and atomic force microscopies, IR spectroscopy, haze, clarity and gloss measurements.

Dr. Stephen M. Martin

Department of Chemical Engineering
134 Randolph Hall (0211)
Blacksburg, VA 24061
Phone: (540) 231-3775; Fax: (540) 213-5022; Email: martinsm@vt.edu

Soft materials, interfaces and self-assembly; Surface functionalization using self-assembled thin films created using the Langmuir-Blodgett technique; Chemical separations employing 'structured fluids' as the transport phase in supported membranes.

Dr. James E. McGrath

Dept. of Chemistry
2111 Hahn Hall (0212)
Blacksburg, VA 24061
Phone: (540) 231-5976; Fax: (540) 231-8517; Email: jmcgrath@vt.edu

Synthesis and characterization of high performance matrix polymers and structural adhesives, high-temperature polymer dielectrics for computers, fire-resistant polymers and composites; and new directly copolymerized sulfonated aromatic copolymers for proton exchange membranes (fuel cells).

Dr. Brian Robert Mohns

Dept. of Chemical Engineering
Blacksburg, VA 24061
Phone: (540) 231-6631; Fax: (540) 231-5022; Email: ikbkt@vt.edu

Dr. Robert B. Moore

Dept. of Chemistry
1103 Hahn Hall (0212)
Blacksburg, VA 24061
Phone: (540) 231-5391; Fax: (540) 231-3255; Email: rbmoore3@vt.edu

Control of morphology/property relationships in ion-containing polymers % Enhanced PEM fuel cell membranes via tailored morphologies % Characterization and control of actuation behavior in ionic polymer metal composite (IPMC) artificial muscles % Use of small-angle x-ray and neutron scattering for the characterization of morphology and dynamics in nanostructured materials and composites.

Dr. Abby Morgan

Dept. of Materials Science and Engineering
231 Holden Hall (0237)
Blacksburg, VA 2406
Phone: (540) 231-6640; Fax: (540) 231-8919; Email: awmorgan@vt.edu

Dr. John Morris

Dept. of Chemistry
1101 Hahn Hall (0211)
Blacksburg, VA 24061
Phone: (540) 231-2472 x539; Email: jmorris@vt.edu

General mechanisms of gas-surface chemical reactions; Selective adsorption on surfaces; How gas-phase pollutants diffuse across and react with pulmonary surfactants.

Dr. Douglas Nelson

Department of Mechanical Engineering
201A Randolph Hall (0238)
Blacksburg, VA 24061
Phone: (540) 231-4324; Fax: (540) 231-9100
Email: doug.nelson@vt.edu

Transportation applications of fuel cells. Modeling, testing, and validation of fuel cell and hybrid electric components and vehicles.

Dr. Raymond H. Plaut

Dept. of Civil Engineering
102-D Patton Hall (0219)
Blacksburg, VA 24061
Phone: (540) 231-6072; Fax: (540) 231-7532; Email: rplaut@vt.edu

Applications of mechanics to model problems in adhesion science. Analysis of the loop tack test for PSAs. Behavior of adhesive bandages peeled from skin.

Dr. Padma Rajagopalan

Assistant Professor
Dept. of Chemical Engineering
141 Randolph Hall, Blacksburg VA 24061
Phone: (540) 231-4851; FAX: (540) 231-5022; Email: padmar@vt.edu

Biomaterials, Cell and Tissue Engineering

Dr. Scott Rennecker

Dept. of Wood Science and Forest Products
106 Brooks Forest Products Center (0503)
Blacksburg, VA 24061
Phone: (540) 231-7100; Fax: (540) 231-8176; Email: srenneck@vt.edu

Biomimetic (bottom-up) composites; Wood plastic composites; Novel processing methods for biomass; Applications of nanotechnology to traditional wood-based composites

Dr. Judy S. Riffle

Dept. of Chemistry
3111 Hahn Hall (0212)
Blacksburg, VA 24061
Phone: (540) 231-8214; Fax: (540) 231-8517; Email: judyriffle@aol.com

Synthesis of multiphase, di- and tri-block copolymer steric stabilizers, preparing nanoscale, superparamagnetic, biocompatible dispersions of these macromolecular magnetic particle complexes.

Dr. Carin L. Roberts-Wollmann

Dept. of Civil and Environmental Engineering
102C Patton Hall (0105)
Blacksburg, VA 24061
Phone: (540) 231-2052; Fax: (540) 231-7532; Email: wollmann@vt.edu

Reinforced and pre-stressed concrete structures; Bridge design and construction.

Dr. Maren Roman

Department of Wood Science and Forest Products
230 Cheatham Hall (0323)
Blacksburg, VA 24061
Phone: (540) 231-1421, Fax: (540) 231-8176; Email: maren.roman@vt.edu

Properties and potential applications of cellulose nanocrystals, molecular interactions of cellulose model surfaces, cellulose-polymer composites and nanocomposites, plant cell wall assembly.

Dr. Surot Thangjitham

Dept. of Engineering Science and Mechanics
328 Norris Hall (0219)
Blacksburg, VA 24061
Phone: (540) 231-4503; Fax: (540) 231-4574; Email: thangjitham@vt.edu

Probabilistic methods and stochastic processes; Vibrations and controls, and Composite structures.

Dr. Craig Thatcher

Dept. of Large Animal Clinical Sciences
College of Veterinary Medicine (0442)
Blacksburg, VA 24061
Phone: (540) 231-6041; Fax: (540) 231-1676; Email: cthatche@vt.edu

Nutrition and Immunity; Trace Mineral Nutrition; Body Composition; Nutrition and Colic.

Dr. Diego Troya

Department of Chemistry
111 Hahn Hall (0212)
Blacksburg, VA 24061
Phone: (540) 231-1381; Fax: (540) 231-3255; Email: troya@vt.edu

Erosion of Polymers in Low-Earth Orbit; Mechanical Properties of Carbon Nanotubes.

Dr. S. Richard Turner

The Macromolecules and Interfaces Institute at *Virginia Tech*
2 Davidson Hall (0201)
Blacksburg, VA 24061
Phone: (540) 231-4552; Fax: (540) 231-3971; Email: stturner@vt.edu

Synthesis and characterization of step-growth hyper-branched ion-containing polymers, and novel-responsive polymers.

Dr. Michael Von Spakovsky

Dept. of Mechanical Engineering
Energy Management Inst. (0238)
Blacksburg, VA 24061
Phone: (540) 231-6684; Fax: (540) 231-9100; Email: vonspako@vt.edu

Thermodynamics (Non-equilibrium, equilibrium, and the unified quantum theory of mechanics and thermodynamics); Thermoeconomics / Environomics.

Dr. John Walz

Dept. Head of Chemical Engineering
133 Randolph Hall (0211)
Blacksburg, VA 24061
Phone: (540) 231 4213; Fax: (540) 231 5022; Email: jywalz@vt.edu

The effect of nonadsorbing polyelectrolytes on colloidal stability; the effect of nonadsorbing polyelectrolytes on the dynamics of particle interaction; the interaction forces between *Cryptosporidium parvum* oocysts and mineral surfaces; development of a new experimental tool for measuring colloidal forces.

Dr. Peter Wapperom

Dept. of Mathematics
572 McBryde Hall
Blacksburg, VA 24061
Phone: (540) 231-7252; Fax: (540) 231-5960; E-mail: wapperom@math.vt.edu

Mathematical modeling and computational fluid dynamics of non-Newtonian fluids. Developing better numerical simulation techniques for flows of polymeric liquids and improving mathematical models. Modeling aspect involves macroscopic and microscopic (stochastic) models for polymeric liquids and non-equilibrium thermodynamics.

Dr. Thomas C. Ward (Professor Emeritus)

Dept. of Chemistry
2107 Hahn Hall (0212)
Blacksburg, VA 24061
Phone: (540) 231-5867; Fax: (540) 231-8238; Email: tward@vt.edu

Problems in polymer science whose solutions have immediate implications to pressing scientific needs. Developing a more universal and quantitative thermodynamic approach.

Dr. Bob West

Dept. of Mechanical Engineering
204 Randolph Hall (0238)
Blacksburg, VA 24061
Phone: (540) 231-7185; Fax: (540) 231-9100
Email: westrl@vt.edu

Computational modeling including model formulation, solution, and correlation of numerical results with experimental data

Dr. Richard E. Weyers

Dept. of Civil Engineering
208 Patton Hall (0105)
Blacksburg, VA 24061
Phone: (540) 231-7408; Fax: (540) 231-7532; Email: rweyers@vt.edu

Durability of composite materials; behavior of Portland cement concrete; abatement of the corrosion of steel in concrete.

Dr. Garth L. Wilkes (Professor Emeritus)

Dept. of Chemical Engineering
142-C Randolph Hall Blacksburg, VA 24061
Phone: (540) 231-5498; Fax: (540) 231-5022; Email: gwilkes@vt.edu

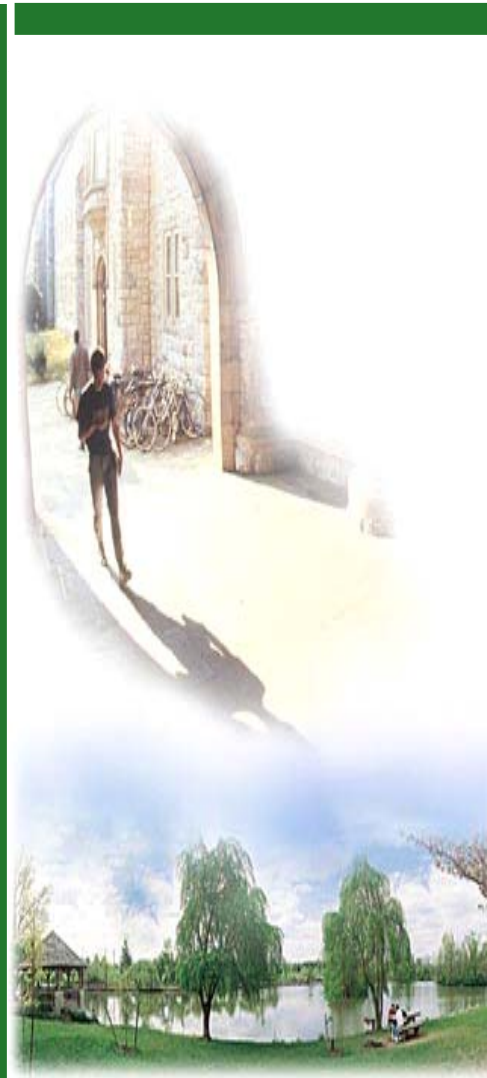
Structure-property behavior of amorphous and semicrystalline polymeric materials.

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Macromolecules and Interfaces Institute

Research Faculty

Virginia Tech



2 Davidson Hall (0201)
Blacksburg, Virginia 24060
Phone: (540) 231-6824
Fax: (540) 231-3971

Something about us.....

The Macromolecules and Interfaces Institute at Virginia Tech provides an interdisciplinary forum for a better understanding of the science of adhesion and includes the areas of chemistry, materials, and mechanics. MIT affiliated laboratories, located throughout the Virginia Tech campus, promote an interdisciplinary approach to understanding the preparation, characterization, testing, and the lifetime prediction of modern adhesives and sealants. For additional information, contact Tammy Jo Hiner at (540) 231-6824, or e-mail: thiner@vt.edu

Meet the faculty

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| Dr. Donald G. Baird Dept. of Chemical Engineering 128 Randolph Hall (0211) Blacksburg, VA 24061 (540) 231-5998; Fax: (540) 2732; Email: dbaird@vt.edu |
| The application of rheology to the processing of polymeric and bio-polymeric systems. |

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| Dr. Justin Barone Dept. of Biological Systems Engineering 303 Seitz Hall (0303) Blacksburg, VA 24061 (540) 231-0680; Fax: (540) 231-3199; Email: jbarone@vt.edu |
| Synthesis, properties, and processing of bio-based polymers. |

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| Dr. David A. Bevan Dept. of Biochemistry 201 Fralin Biotech Center (0308) Blacksburg, VA 24061 (540) 231-5040; Fax: (540) 231-9070; Email: drbevan@vt.edu |
| Molecular modeling; Protein structure and function. |

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| Dr. Scott Case Dept. of Engineering Science and Mechanics 20 Patton Hall (0219) Blacksburg, Virginia 24061 Phone: (540) 231-3140; Fax: (540) 231-4574; Email: scase@vt.edu |
| Life prediction techniques for composite materials, experimental characterization of elevated temperature polymeric composites, micromechanical modeling of composite behavior; durability of fuel cell systems. |

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| Dr. Richard Claus Dept. of Electrical Engineering 340 Whittemore Hall "Blacksburg, VA 24061 (540) 231-7203; Fax: (540) 231-4561 Email: roclaus@vt.edu |
| Fiber optics; Materials. |

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| Dr. Sean Corcoran Dept. of Materials Science and Engineering Collegiate Square, Suite 302 (0286), 460 Turner Street Blacksburg, Virginia 24061 Phone: (540) 231-0188; Fax: (540) 231-3554; Email: sgc@vt.edu |
| Mechanical and tribological properties of nanoscale contacts; environmental effects on mechanical properties. |

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| Dr. Thomas E. Cousins Dept. of Civil and Environmental Engineering 102B Patton Hall (0105) Blacksburg, VA 24061 (540) 231-6753; Fax: (540) 231-7532; Email: tcousins@vt.edu |
| Behavior of bridge structures, use of high performance materials in structures, prestressed concrete structures, experimental research. |

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| Dr. Richey M. Davis Dept. of Chemical Engineering 130 Randolph Hall (0211) Blacksburg, VA 24061 (540) 231-4578; Fax: (540) 231-5022; Email: rmdavis@vt.edu |
| Physical chemistry and rheology of polymer solutions and colloidal suspensions with emphases on water-soluble polymers and suspensions in aqueous media. |

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| Dr. Paul Deck Dept. of Chemistry 2101 Hahn Hall (0212) Blacksburg, VA 24061 (540) 231-3493; Fax: (540) 231-8517; Email: pdeck@vt.edu |
| Invention and development of transition-metal organometallic catalysts for organic transformations, especially olefin polymerization. |

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| Dr. David A. Dillard Dept. of Engineering Science and Mechanics 120-E Patton Hall (0219) Blacksburg, VA 24061 (540) 231-4714; Fax: (540) 231-9187; Email: dillard@vt.edu |
| Fracture and time dependent behavior of adhesives and sealants; development of appropriate test methods for adhesive bonds; analytical and numerical (finite element) analysis of stresses in bonded joints. Fuel cell PEM characterization and durability. |

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| Dr. John G. Dillard Dept. of Chemistry 406-A Davidson Hall (0201) Blacksburg, VA 24061 (540) 231-6926; Fax: (540) 231-3255; Email: johndillard@vt.edu |
| Surface chemistry related to adhesive bonding, analytical applications and development of NMR techniques including direct coupling of high performance liquid chromatography and nuclear magnetic resonance |

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| Dr. Harry Dorn Dept. of Chemistry 1109 Hahn Hall (0212) Blacksburg, VA 24061 (540) 231-5953; Fax: (540) 231-3255; Email: hdorn@vt.edu |
| Direct coupling of high performance liquid chromatography and nuclear magnetic resonance, HPLC-NMR; Electron paramagnetic resonance (EPR) and dynamic nuclear polarization (DNP); Synthesis, separation, and functionalization of the newly discovered carboneous nanomaterials, nanotubes, fullerenes and metal encapsulated fullerenes. |

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| Dr. John Duke, Jr. Dept. of Engineering Science and Mechanics 226 Norris Hall (0219) Blacksburg, VA 24061 (540) 231-6063; Fax: (540) 231-4574; Email: the.nde.guy@vt.edu |
| Nondestructive measurement science, testing, and evaluation; Experimenal mechanics; Materials Behavior. |

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| Dr. Susan E. Duncan Dept. of Food Science and Technology FST Bldg., Room 30 (0418) Blacksburg, VA 24061 (540) 231-8675; Fax: (540) 231-9293; Email: duncans@vt.edu |
| Chemical , physico-chemical, and sensory measures of multiphase biological systems with applications to food and beverages; food-polymer interactions. |

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| Dr. Kevin J. Edgar Dept. of Wood Science and Forest Products 230-A Cheatham Hall (0323) Blacksburg, VA 24061 (540) 231-0674; (540) 231-8176; Email: kjedgar@vt.edu |
| Synthesis of polysaccharide and carbohydrate derivatives. Creation of novel drug delivery polymers and systems to address important patient needs. Chemistry of cellulose and other natural polysaccharides. |

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| Dr. Michael W. Ellis Dept. of Mechanical Engineering 100F3 Randolph Hall (0238) Blacksburg, VA 24061 (540) 231-9102; Fax: (540) 231-9100; Email: mwellis@vt.edu |
| Numerical modeling of fuel cell performance; Experimental measurement of fuel cell performance; Fuel cells for building power applications. |

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| Dr. Alan Esker Dept. of Chemistry 1107 Hahn Hall (0212) (540) 231-4601; Fax: (540) 231-3255; Email: aesker@vt.edu |
| Polymer dynamics at surfaces and interfaces with a special emphasis on magnetic fluid interactions with biomimetic cell membranes, polysaccharide self-assembly in thermoplastic composites, and the effects of nanofillers on thin film properties. |

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| Dr. Willard H. Eyestone Dept. of Large Animal Clinical Sciences College of Veterinary Medicine (0442) Blacksburg, VA 24061 (540) 231-4834; Fax: (540) 231-4621; Email: wevest@vt.edu |
| Developmental biology of laboratory and domestic animals; Animal cloning by somatic cell nuclear transfer. |

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| Dr. Charles E. Frazier Dept. of Wood Science & Forest Products 210 Cheatham Hall (0323) Blacksburg, VA 24061 (540) 231-8318; Fax: (540) 231-8176; Email: cfrazier@vt.edu |
| Adhesion and polymer science with an emphasis on wood-based composite materials; thermosetting and thermoplastic adhesives for wood; wood rheology for structure/property determination. |

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| Dr. Paul Gatenholm Dept. of Materials Science and Engineering 309 Holden Hall (0237) Blacksburg, VA 24061 (540) 231-3152; (540) 231-8919; Email: pgatenho@vt.edu |
| Biomimetic design and assembly of biopolymers into biomacromolecular materials for use as advanced packaging, structural nanocomposites and biomaterials for regenerative medicine. |

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| Dr. Harry W. Gibson Dept. of Chemistry 2105 Hahn Hall (0212) Blacksburg, VA 24061 (540) 231-5902; Fax: (540) 8617; Email: hwgibson@vt.edu |
| Synthesis of polymers with novel architectures; Use of Reissert compounds in stereoselective synthesis and polymerizations. |

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| Dr. Wolfgang Glasser (Professor Emeritus) Dept. of Wood Science and Forest Products 324 Cheatham Hall (0323) Blacksburg, VA 24061 (540) 231-4403/7051; Fax: (540) 231-7664; Email: wglasser@vt.edu |
| "Molecular structure of woody biomass. Chemistry and utilization of polymeric wood components, esp. cellulose and lignin." |

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| Dr. Aaron Goldstein Dept. of Chemical Engineering 143B Randolph Hall (0211) Blacksburg, VA 24061 Phone: (540) 231-3674; Fax: (540) 231-5022; Email: goldst@vt.edu |
| Biomaterials and polymer processing; Tissue engineering for orthopaedic applications. |

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| Dr. Nakhiah Goulbourne Dept. of Mechanical Engineering 307 Durham Hall (0261) Blacksburg, VA 24061 (540) 231-2917; Fax: (540) 231-9100; Email: nakg@vt.edu |
| Development of Biologically-Inspired Actuators for Surgical Procedures; Dynamic Inflation of Dielectric Elastomer Actuators; Novel Actuator Constructs Using Dielectric Elastomers; |

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| Constitutive Modeling of Electroactive Polymers; Electroelastic Modeling and Analysis of Active Polymer Membranes |
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| Dr. James R. Heflin Dept. of Physics 108 Robeson Hall (0435) Blacksburg, VA 24061 (540) 231-4504; Fax: (540) 7511; Email: heflin@vt.edu |
| Self-assembled organic optoelectronic nanostructures and devices; nonlinear optical materials, organic solar cells, optical fiber biosensors, micro gas chromatography systems, antireflection coatings, electrochromic devices. |

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| Dr. Michael W. Hyer Dept. of Engineering Science and Mechanics 218 Norris Hall (0219) Blacksburg, VA 24061 (540) 231-5372; Fax: (540) 231-9187; Email: hyerm@vt.edu |
| Mechanics of composite materials and structures, solid mechanics. |

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| Dr. Rakesh K. Kapania Dept. of Aerospace and Ocean Engineering 213 Randolph Hall (0203) Blacksburg, VA 24061 (540) 231-4881; Fax: (540) 231-9632; Email: rkapania@vt.edu |
| Structural Health Monitoring and Sensors, Analysis and Design of Adhesively Bonded Composite Structures, Neural Networks and Genetic Algorithms, and Stochastic Response of Structures. |

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| Dr. Erdogan Kiran Dept. of Chemical Engineering 133 Randolph Hall (0211) Blacksburg, VA 24061 (540) 231-55671; Fax: (540) 231-5022; Email: ekiran@vt.edu |
| Polymer science and polymeric materials, supercritical fluids and high-pressure processes, and thermal and optical measurement techniques. |

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| Dr. John (Jack) Lesko Dept. of Engineering Science and Mechanics 120-D Patton Hall (0219) Blacksburg, VA 24061 (540) 231-5259; Fax: (540) 231-9187; Email: jlesko@vt.edu |
| Adhesives for transportation and infrastructure, and biomedical applications. |

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| Dr. Timothy E. Long Dept. of Chemistry 2110 Hahn Hall (0344) Blacksburg, VA 24061 (540) 231-2480; Fax: (540) 231-8517; Email: telong@vt.edu |
| Synthesis and characterization of well defined macromolecular architectures for performance in diverse applications ranging from biomedical technologies to electronic devices. |

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| Dr. Guo Q. Lu Department of Materials Science and Engineering 213 Holden Hall (0237) Blacksburg, VA 24061 (540) 231-8686; Fax: (540) 231-8919; Email: gqlu@vt.edu |
| Crystal growth and synthesis of powder materials with novel magnetic and optical properties; processing of powder materials into multilayer structures for electronic and optoelectronic packaging. |

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| Dr. Louis A. Madsen Department of Chemistry 405 Davidson Hall (0212) Blacksburg, VA 24061 Phone: (540) 231-1270; Fax: (540) 231-3255; Email: lmadsen@vt.edu |
| Can we relate molecular details of soft materials to macroscopic behaviors? NMR spectroscopy and microimaging can access properties on many length and time scales, notably on fuel cell ionomers and in supercritical CO ₂ processing. |