<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME/PLACE</th>
<th>SPEAKER</th>
<th>TITLE</th>
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</thead>
<tbody>
<tr>
<td>August 23, 2016</td>
<td>12:30 pm – 1:45 pm</td>
<td>Dr. Ellen Moomaw, Associate Professor</td>
<td>• The Enzymology of Bicupin Oxalate Oxidase</td>
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<tr>
<td></td>
<td>CL 1009</td>
<td>Dr. Bharat Baruah, Associate Professor</td>
<td>• Fabrication of ZnO Nanomaterials-Modified Cotton Fabric and Their Utilization in</td>
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<td>Dr. Carol Chrestensen, Associate Professor</td>
<td>Photocatalytic Reactions</td>
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<td></td>
<td>Kennesaw State University</td>
<td>• The Intersection of MAP kinases and eNOS</td>
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<tr>
<td>September 1, 2016</td>
<td>12:30 pm – 1:45 pm</td>
<td>Dr. Daniela Tapu, Professor</td>
<td>• New Architectures in N-Heterocyclic Carbene Chemistry</td>
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<td>CL 1009</td>
<td>Dr. Kimberly Cortes, Assistant Professor</td>
<td>• Development of Visual Literacy in Biochemistry</td>
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<td>Dr. Michael Stollenz, Assistant Professor</td>
<td>• Novel Multinuclear Coinage Metal Clusters to Design Molecular Light-Emitting Devices</td>
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<td>Kennesaw State University</td>
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<tr>
<td>September 6, 2016</td>
<td>12:30 pm – 1:45 pm</td>
<td>Dr. Marina Koether, Professor</td>
<td>• Interdisciplinary Studies in Chemistry as an</td>
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<td>CL 1009</td>
<td>Dr. Janet Shaw, Associate Professor</td>
<td>Analytical Chemist</td>
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<td>Dr. Rajnish Singh, Associate Professor</td>
<td>• Charged and Confused: Water Soluble N-confused Tetrathenylporphyrins</td>
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<td>Kennesaw State University</td>
<td>• Peroxisomes and Stress Kinases: an Unfolding Story</td>
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<tr>
<td>October 4, 2016</td>
<td>12:30 pm – 1:45 pm</td>
<td>Dr. Charlie Carter</td>
<td>Urzymology: Building an Experimental Alternative to</td>
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<td></td>
<td>CL 1009</td>
<td>Biochemistry and Biophysics, UNC Chapel Hill</td>
<td>the RNA World</td>
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<tr>
<td>October 27, 2016</td>
<td>12:30 pm – 1:30 pm</td>
<td>Dorothy Colegrove, Chemist, Conoco-Phillips</td>
<td>Oilfield Chemistry Applications at the Kuparuk Laboratory</td>
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<td>Kennesaw State University</td>
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<td>November 1, 2016</td>
<td>12:30 pm – 1:30 pm</td>
<td>CL 1009</td>
<td>Dr. Preet Singh&lt;br&gt;School of Materials Science and Engineering&lt;br&gt;Georgia Institute of Technology</td>
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<tr>
<td>November 29, 2016</td>
<td>12:30 pm – 1:30 pm</td>
<td>CL 1009</td>
<td>Dr. Steven Bullock&lt;br&gt;Senior Staff Materials Engineer at Lockheed Martin Aeronautics</td>
</tr>
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Departmental Seminar Series
Tuesday, August 23rd, 2016
CL 1009 at 12:30-1:45 pm

Dr. Ellen Moomaw

The Enzymology of Bicupin Oxalate Oxidase

Dr. Bharat Baruah

Fabrication of ZnO Nanomaterials-Modified Cotton Fabric and Their Utilization in Photocatalytic Reactions

Dr. Carol Chrestensen

The Intersection of MAP kinases and eNOS
Departmental Seminar Series
Thursday, September 1st, 2016
CL1009 at 12:30-1:45 pm

Dr. Daniela Tapu
New Architectures in N-Heterocyclic Carbene Chemistry

Dr. Kimberly Cortes
Development of Visual Literacy in Biochemistry

Dr. Michael Stollenz
Novel Multinuclear Coinage Metal Clusters to Design Molecular Light-Emitting Devices
Departmental Seminar Series
Tuesday, September 6th, 2016
CL1009 at 12:30-1:45 pm

Dr. Marina Koether
Interdisciplinary Studies in Chemistry
as an Analytical Chemist

Dr. Janet Shaw
Charged and Confused: Water Soluble
N-confused Tetrephylporphyrins

Dr. Rajnish Singh
Peroxisomes and Stress Kinases:
an Unfolding Story
Aminoacyl-tRNA synthetases (aaRS) implement molecular self-reference by catalyzing the chemical reactions necessary for protein synthesis and the translation of the universal genetic code. As noted elsewhere (1), the physics of proteins endow them with the ability to engineer chemistry on a nanoscale perhaps 100 million-fold more precisely than can catalytic RNA. We are interested in how this programming language came to be embedded in transfer RNA simultaneously with the emergence and selection of genes written in that programming language (2). We showed recently that genetics arose by at least two distinct stages of indirect coding, first encoding amino acid size in the tRNA acceptor stem and only later encoding amino acid polarity in the anticodon (2; 3). Experimental validation of the sense/antisense ancestry of the two aaRS classes (4) strongly supports the idea that the earliest proteins were read from mRNAs derived from both strands of the same gene. These recent experimental studies of how the two aaRS families evolved (5-10) now allow us to construct a crude but experimentally testable path for stepwise evolution of the code. (Supported by NIGMS R01-78227 to CWC Jr.)

1. Wills PR. 2016. Phil. Trans. R. Soc. A A374:20150016
Dorothy Colegrove graduated from KSU with a BS in Professional Chemistry. Her career in Chemistry jumped between four different industries in four US states within five years of graduation. After hopping around the country, she found the Arctic environment was the best fit. For the past eight years, she has been working in various roles in Alaska’s North Slope region supporting Oil & Gas upstream activities. Since 2014, she has overseen operations at the Kuparuk Laboratory for Conoco-Phillips Alaska. Analyzing oil is only 5% of the work. She works with instrumentation you might not expect (ICP-OES, IC, WD-XRF, XRD, GC-FID, and LASER Particle Size Analysis) as well as those you would (FTIR, pH, density, viscosity, and titrators).
Seminar Title: Corrosion Research at Georgia Tech - Corrosion of Pipeline Steels in Fuel Grade Ethanol

Dr. Preet Singh
School of Materials Science and Engineering
Georgia Institute of Technology

Abstract
Renewable biofuels are important alternative to the fossil fuel, especially for the transportation needs while minimizing environmental impact. Bioethanol is already being used as a major alternative liquid fuel to replace conventional gasoline for road transportation in the USA. However, stress corrosion cracking (SCC) of carbon steel pipelines in fuel grade ethanol (FGE) is the main concern that has prevented a widespread use of pipelines to transport FGE. This talk will present results from a systematic study done to understanding the mechanism of SCC in FGE and simulated fuel grade ethanol (SFGE). Results have shown that it is not the pure FGE but the impurities in the FGE along and dissolved oxygen that are the main factors influencing corrosion and SCC in fuel-grade ethanol. Film related anodic dissolution mechanism was found to be a major driving force for crack initiation and growth. Repassivation kinetics studies have shown that the competition between the film growth and its breakdown controls the crack propagation during slow strain rate tests for SCC. Effect of environmental parameters, steel microstructure, and stress on the film formation and breakdown on carbon steel will be discussed.

Short Bio
Dr. Preet M. Singh is a Professor and Associate Chair of Graduate Study at the School of Materials Science and Engineering at the Georgia Institute of Technology. He got his Ph.D. in Materials Science and Engineering from the University of Newcastle Upon Tyne, UK in 1989. For almost 30 years, his research is focused on the fundamental understanding of the environmental degradation of material properties, especially for metals and alloys, and their protection. Research areas of his interest include monitoring and control of aqueous corrosion, stress corrosion cracking (SCC), corrosion fatigue (CF), high temperature corrosion of engineering materials, and microstructure property relations in metallic materials. He has also worked on the mechanical properties of materials including damage accumulation in metal matrix composites (MMCs) and aluminum alloys. His recent research work is related to corrosion and stress corrosion cracking issues in the chemical process industry, biofuels, nuclear industry, concrete reinforcement, and other infrastructure. Dr. Singh has published over 225 papers, of which over 185 papers have been published in refereed journals, book chapters, and conference proceedings. He is an active member of NACE-International, ASM-International, TMS, AIST, TAPPI and has co-organized a number of international symposiums. In 2008, Prof. Singh was elected as a Fellow of NACE-International and in 2013 he was elected as a Fellow of ASM-International.
Departmental Seminar Series  
Tuesday, November 29, 2016  
CL 1009 at 12:30-1:30pm

Polymer Chemistry: Structure and Property Relationships

Dr. Steven Bullock  
Senior Staff Materials Engineer at Lockheed Martin Aeronautics  
Part-Time Assistant Professor at Kennesaw State University

Abstract
This brief overview of polymers will begin with polymer chemistry and structure. Polymer properties arise due to structural units that comprise each polymer chain. Subtle differences exist between crystalline and amorphous polymers, thermoset and thermoplastic and block copolymers. We will discuss each type of polymer and their corresponding synthesis procedure. The metallocene catalytic mechanisms control polymer molecular weight and the block copolymer structure. Anionic polymerization give rise to microphase separated the block copolymer structure are described by the Flory Huggins interaction parameter and have lamellar, cylindrical and hexagonal close packed spheres within a polymer matrix.

The catalytic mechanisms of several modern polymerization techniques will be discussed that are described as living polymerizations. Ring opening metathesis polymerization (ROMP) and atom transfer radical polymerization (ATRP) are examples of a living polymerization that allow polar monomers such as carbonyls or amines to be polymerized. Previously, most carbonyl monomers deactivated anionic catalysts such as Ziegler Natta (TiCl$_4$-AlEt$_3$) catalyst used to make commodity polymers such as polyethylene. ROMP catalyst systems are typified by the ruthenium benzylidene class that produces high molecular weight and low polydispersity. ATRP polymers have similar characteristics to ROMP polymers and utilize less expensive copper based catalysts to achieve similar results.

Publications: