

### **Upcoming Program Deadlines and Event Dates**

CUGR Event/Program	DATE
2014-15 Fall Fellowship Proposals Submission ( <i>FIRM</i> <i>Deadline</i> )	10/15/14 at 4:00 PM (Eastern Standard Time)
2014-15 Fall Fellowship Acceptance Notifications	10/31/14
2014-15 Fall Fellowship Performance Period	11/1/14 — 5/1/15
2015 Annual Showcase Abstracts Submission ( <i>FIRM Deadline</i> )	2/28/15 at 4:00 PM (Eastern Standard Time)
2015 Showcase Acceptance Notification	3/16/15
2015 Annual Showcase Event Date	April 2015 (exact Date TBA)

All Proposal Details and Applications can be found on the CUGR website

All Proposals and Applications are to be completed and submitted ELECTRONICALLY at CUGR.UMAINE.EDU

## CUGR would like to welcome our newest members of the CUGR Advisory Committee!

- Patricia Poirier, Assistant Professor of Nursing
- Jennifer Moore, Department of Communication and Journalism
- Roberto Lopez-Anido, Professor of Civil Engineering
- Ebru Ulusoy, Assistant Professor of Marketing
- Karl Kreutz, Climate Change Institute, School of Earth and Climate Sciences

#### **CUGR PURPOSE**

In the fall of 2012, the highest levels of university leadership indicated support for increased undergraduate research opportunities for students and faculty by awarding CUGR a President's Request for Vision of University Excellence (PRE-VUE) grant entitled, "Enhancing Undergraduate Academic Experiences through Student-Faculty Research Collaborations". This grant has led to the establishment of a Fellowship Program which began last year. The goal of CUGR is to enhance and increase undergraduate student involvement in faculty-supervised research.

#### **Fellowships**

The Fall and Summer Fellowships were established to help provide financial <u>support</u> for undergraduate student research as well as provide additional funding, if necessary, for supplies or other research-related expenses.

#### **Academic Showcase**

This event allows students from all departments the opportunity to display their research and creative activities amongst peers and the community, and get recognized by receiving awards for outstanding work.

#### **Faculty Fellows Program**

This program aims to develop a cohort of faculty mentors and increase activities toward future funding of undergraduate research. The CUGR Research Fellows Program supports faculty efforts toward improving undergraduate research and scholarship mentoring skills, expanding curricula to include research and scholarship experiences, and developing proposals for further funding specifically involving undergraduate students.

#### 2014 Annual Academic and Creative Showcase

To view video presentations from last years' Showcase visit: youtube.com Domain Name: Center4UG\_Research@UMaine https://www.youtube.com/channel/UCGLazUFVTtrk9SzFkvl39JA

### 2014 Summer Fellowship Award Recipients

- **1. Walczak, Danielle** (Communication and Journalism) Fresh Light: Maine's Young Small Diversified Farmers Growing Hope in Maine , **Adviser: Margaret Nagle**
- **2. Beacham, Gwendolyn** (Molecular and Biomedical Sciences) Towards understanding Cluster E phage integration and maintenance of lysogeny, **Adviser: Sally Molloy**
- **3. Bovie, Marissa** (Anthropology) Landscape evolution and human agency along Croatia's Adriatic Coast, **Adviser: Greg Zaro**
- **4. Tyler, Roy** (Psychology) Activated Microglia in a Mouse Model of Chemo-Brain, **Adviser: Thane Fremow**
- **5. Sell, Julia** (Physics) Platinum-Zirconium Diboride (Pt-ZrB2) Multilayer Thin Film Structures for Sensor Applications in Harsh High Temperature Environments, **Adviser: Robert Lad**
- **6. Bowser, Torey** (Marine Sciences) Arsenic Exposure of Zebrafish (Danio rerio) Embryos and the Potential to affect Adult Fish Behavior, **Adviser: Rebecca Van Beneden**
- **7.** Harris, Katrina (Molecular and Biomedical Sciences) Identification of Genome and integration Morphology of Mycobacteriophages ChipMunk and EvilGenius, Adviser:Keith Hutchison
- **8. Fish, Amy** (Food and Agriculture) Evaluation of Persistance Factors in C.pseudotuberculosis, **Adviser: Anne LichtenWalner**
- Merk-Wynne, Taylor (Mechanical Engineering) Micromechanical Modeling of Fiber Reinforced
   Composites, Adviser: Snethil Vel
- **10. Pereira, Juliana** (Marine Sciences) Satellite-measured bio-optical measurements of Lagoa dos Patos,Brazil, **Adviser: Andrew Thomas**

# 2014 Summer Fellowship Award Recipients' Project Updates!



Gwendolyn Beacham: Towards understanding Cluster E phage integration and maintenance of lysogeny

I have been working on finding the location at which temperate Cluster E phage insert their genomes into the bacterial genome, which is referred to as attP in the phage genome and attB in the bacterial genome. I have not yet located this site but have designed a new method for searching for attP and I have ruled out several sites as possibilities. I began searching for attP using PCR primers designed to amplify overlapping sequences across the entire Ukulele genome. During phage integration, the phage genome is inverted when

it is inserted into the host genome. Therefore, primers that flank a sequence including the attP core will produce an amplicon from the Ukulele phage genomic template but not from the Ukulele M. smegmatis lysogen genomic template. However, I have determined this method for identifying attP will not work for Ukulele. Ukulele lysogens are "leaky" meaning they frequently release phage genomes. This means that even if my primers flank the correct attP core, the sequence will be amplified from contaminating phage particles in my lysogen template. This will mask the detection of attP. Therefore, I decided instead to test putative attP cores using two sets of primers: one set that amplifies a putative attP core in Ukulele and another set that amplifies a corresponding putative attB core in M. smegmatis. Primers that amplify the correct attP and attB cores will amplify lysogen specific attL and attR products from lysogen genomic template, providing a positive result for attP without being masked by amplification due to contaminating phage particles. In addition to this, I have been able to identify more strong candidates for attP by searching for sites that have certain characteristics of known attP sites.

Taylor Merk-Wynne: Micromechanical Modeling of Fiber Reinforced Composites



The research focuses mainly on 2-D woven fiber reinforced composites. The work consisted of a literature review, development of computer codes of analytical models, and assessment and recommendation of the models including Digimat, a software program designed specifically for composite material analysis.

A relatively extensive literature review was conducted because the field of 2-D woven composites was pretty new to all of us. We had proposed to study models that could

predict the effective properties and failure mechanics but it became apparent that limiting ourselves to examining effective property predictions only would be the best use of time. We were looking for theories and models that used simple algebraic expressions analogous to those we were familiar with for unidirectional fiber composites, but they don't appear to exist. Instead, instructional computer codes were generated for several relatively simple analytical models. The codes and instructions were developed with the intent that they could be used as a teaching/learning tool in an undergraduate setting. A number of variations of these models were also developed and compared to experimental data presented in the literature, and a final recommendation was made.