

A watercolor illustration of the Cincinnati Suspension Bridge and a bus. The bridge is shown in a light blue and grey tone, with its two towers and suspension cables clearly visible. A bus is depicted in the foreground, also in a light blue and grey tone, with the word 'WELCOME' visible on its side. The background is a plain white color.

# **An Overview RET Site, Expectations & Work**

**Dr. Anant R. Kukreti**

**Outreach Director & Professor**

**Department of Civil and Environmental Engineering**

**College of Engineering**

**University of Cincinnati**

**June 21, 2010**

# **PRESESENTATION OUTLINE**

- **Introductions**
- **Project Office & Contact Information**
- **Other Project Participants**
- **Research Project Titles & Participants**
- **Goals of the RET Site Activities**
- **RET Site Activities**
- **Laboratory & Office Usage & Safety Issues**

# RET PROJECT OFFICE and CONTACT INFORMATION

- Project Offices

- Baldwin Hall 746 & 756

- Project Director

- ◆ Dr. Anant R. Kukreti
- ◆ Office: ERC 701F
- ◆ Phone: 513-556-4105
- ◆ E-Mail: [anant.kukreti@uc.edu](mailto:anant.kukreti@uc.edu)

- General Help Contact

- ◆ Ms. Andrea Burrows (RET Coord.)
- ◆ Office: 5506 French Hall
- ◆ Phone: 513-556-1029, 407-963-6818
- ◆ E-Mail: [Andrea.burrows@uc.edu](mailto:Andrea.burrows@uc.edu)

## Computer Help

Mr. Ken Maxwell  
Office: 5508 French Hall  
Phone: 513-307-3382 (C)  
E-Mail: [maxwelljrj@gmail.com](mailto:maxwelljrj@gmail.com)

- Financial Reimbursement Contact

- ◆ Ms. Mary Ann Schaefer
- ◆ Office: Baldwin Hall, Room 765
- ◆ Phone: 513-556-3630
- ◆ E-Mail: [schaefmy@ucmail.uc.edu](mailto:schaefmy@ucmail.uc.edu)

# OTHER RET PROJECT PARTICIPANTS

## ▪ College of Engineering Research & Education Faculty

- ♦ Dr. George Sorial (CEE-Water)
- ♦ Dr. Mingming Lu (CEE-BioDiesel)
- ♦ Dr. Kelly Cohen (AE-Flight)
- ♦ Mr. Eugene Rutz (CoE-PreEng)
- ♦ Dr. Vesselin Shanov (CME-Energy)
- ♦ Dr. Heng Wei (CEE-Trans)
- ♦ Dr. Doug Kohls (ME-NanoMat)

## ▪ College of Education & Evaluation Services Center Faculty

- ♦ Dr. Jon Breiner (CECH/A&S)
- ♦ Dr. Catherine Maltbie (ESC)

## ▪ Graduate Assistants

- ♦ Hafiz Salih (Env-Water)
- ♦ Qingshi Tu (Env-BioDiesel)
- ♦ Cody LaFountain (AE-Flight)
- ♦ Feng Wang (Materials-Energy)
- ♦ Zhixia Li (CE-Trans)
- ♦ Kelly Cross (Mech-NonoMat)

## ▪ NSF STEP Graduate Fellows

- ♦ Ms. Amina Darwish
- ♦ Mr. Ahmad Mostafa
- ♦ Ms. Chelsea Sabo
- ♦ Mr. Nick Hanlon
- ♦ Ms. Anna Nagle

# RET RESEARCH PROJECT TITLES AND PARTICIPANTS

- Project # 1: Availability of Safe Drinking Water
  - ◆ Teacher Participants
    - ◆ Ms. Sara Bagley, Erpenbeck Elementary School, KY
    - ◆ Mr. Scott Ketcham, UC Pre-service, OH
  - ◆ Faculty Mentor
    - ◆ Dr. George A. Sorial, Professor of Civil and Environmental Engineering
    - ◆ George.Sorial@uc.edu , 756F Baldwin Hall
    - ◆ 513-556-2987, 513-515-4473 (C)
  - ◆ Graduate Student Mentor
    - ◆ Mr. Hafiz Salih,
    - ◆ salihhh@mail.uc.edu, 709 Rhodes Hall
    - ◆ 513-382-5480 (C)

# RET RESEARCH PROJECT TITLES AND PARTICIPANTS

- Project # 2:     **Making Biodiesel for Research and Education**
  - ◆ Teacher Participants
    - ◆ Mr. Chris Behm, Riverview East Academy, OH
    - ◆ Ms. Jenn Keiner, UC Pre-service, OH
  - ◆ Faculty Mentor
    - ◆ Dr. Mingming Lu, Associate Professor of Civil and Environmental Eng.
    - ◆ Mingming.Lu@uc.edu, 797 Rhodes Hall
    - ◆ 513-556-0996
  - ◆ Graduate Student Mentor
    - ◆ Mr. Qingshi Tu
    - ◆ tuqi@mail.uc.edu, 709 ERC
    - ◆ 513-364-6079

# RET RESEARCH PROJECT TITLES AND PARTICIPANTS

## ■ Project # 3: Bio-Inspired Flight

### ◆ Teacher Participants

- ◆ Ms. Melissa Burns, Sharpsburg Elementary, OH
- ◆ Ms. Amy Jameson, Dater High School, OH

### ◆ Faculty Mentor

- ◆ Dr. Kelly Cohen, Associate Professor of Aerospace Engineering
- ◆ Kelly.Cohen@uc.edu, 732 Rhodes Hall
- ◆ 513-556-3523

### ◆ Graduate Student Mentor

- ◆ Mr. Cody Lafountain
- ◆ lafouncj@mail.uc.edu, 518 Old Chem
- ◆ 419-722-1753 (C)

# RET RESEARCH PROJECT TITLES AND PARTICIPANTS

## ■ Project # 4: Renewable Energy System

### ◆ Teacher Participants

- ◆ Ms. Stephanie Baldwin, Little Miami Junior High, OH
- ◆ Mr. Deon Edwards, Western Hills Engineering HS, OH

### ◆ Faculty Mentor

- ◆ Dr. Vesselin Shanov, Associate Professor of Chemical & Materials Eng.
- ◆ vesselin.shanov@uc.edu. 578 ERC
- ◆ 513-556-2461

### ◆ Graduate Student Mentor

- ◆ Mr. Feng Wang
- ◆ wangf4@mail.uc.edu, 602 Rhodes Hall
- ◆ 513-373-2271



# RET RESEARCH PROJECT TITLES AND PARTICIPANTS

- Project # 5:     **Simulation-Based Impact Analysis of Signalized Intersections**
  - ◆ Teacher Participants
    - ◆ Mr. Todd Bonds, NKU Pre-service, KY
    - ◆ Ms. Kelli Lee, Grant County Middle School, KY
  - ◆ Faculty Mentor
    - ◆ Dr. Heng Wei, Assistant Professor of Civil and Environmental Eng.
    - ◆ heng.wei@uc.edu, 792 Rhodes Hall
    - ◆ 513-556-3781
  - ◆ Graduate Student Mentors
    - ◆ Mr. Zhixia Li
    - ◆ lizx@mail.uc.edu , 735 ERC
    - ◆ 513-484-2991

# RET RESEARCH PROJECT TITLES AND PARTICIPANTS

- Project # 6: Nanotechnology in Health/Beauty
  - ◆ Teacher Participants
    - ◆ Ms. Tracy Greeley Howard, Woodward Career Tech HS, OH
    - ◆ Ms. Michelle Marlow, UC Pre-service, OH
  - ◆ Faculty Mentor
    - ◆ Dr. Doug Kohls, Research Assistant Professor of Chemical & Materials Engineering
    - ◆ doug.kohls@uc.edu, 727 Rhodes Hall
    - ◆ 513-556-3246
  - ◆ Graduate Student Mentor
    - ◆ Ms. Kelly Cross
    - ◆ crosskj@mail.uc.edu, 310 ERC
    - ◆ 765-414-4861

# GOALS OF THE RET SITE ACTIVITIES

- **Goal 1:** Explore the scientific method of inquiry and the critical research skills that engineers use to solve open-ended real-world problems
- **Goal 2:** Become role models by applying research experiences in classrooms and with colleagues
- **Goal 3:** Link education to events and issues occurring within the community and encourage students to become effective citizens in a technology-driven society

# RET SITE ACTIVITIES: OVERVIEW

**RESEARCH  
(1:00-6:00)**

**PROFESSIONAL  
DEVELOPMENT  
(9:00-12:00)**

**Research  
Skills Training  
Workshops**

**Education  
Seminars**

**Pre-Engineering  
Course**

**Engineering  
Seminars  
& Field Trips**

**STEP  
Interaction**

**CLASSROOM IMPLEMENTATION PLAN**

# RET SITE ACTIVITIES: RESEARCH

**RESEARCH**  
(1:00 to 6: pm)

**Week 1: Identify Goals, Tasks, Schedule, Conduct Literature Search, and Learn Research Tools**

**Weeks 2-5: Complete Literature Search, Test, Synthesize, Analyze, and Generalize Results**

**Week 6: Wrap-Up for Final Deliverables**

## **Project Deliverables:**

- 1. Research Report**
- 2. Research PP Presentation**
- 3. Research Poster**
- 4. Classroom LP Report**
- 5. Classroom PP Presentation**
- 6. Classroom Poster**
- 7. Summary Report & 4 Pictures**

# RET SITE ACTIVITIES:

## PROFESSIONAL DEVELOPMENT SEMINARS

**PROFESSIONAL  
DEVELOPMENT  
(9:00 to 12:00 pm)**

**Skills Seminars**  
Computer Use, Lab Safety,  
Technical Writing, Literature Search,  
& Poster Making

**Education Seminars**  
Inquiry Learning, Assessment,  
Misconceptions, & GK-12 Integration

**Engineering Seminars**  
Pre-Engineering Course and  
How Engineers Use Math and Science

**Field Trips to Engineering Sites  
(Not only in the morning)**

# RET SITE ACTIVITIES:

## Reflective Reporting

- Each participant will submit a Reflective Feedback Report on Friday [during the reflective feedback session (purple box)]
- Bring a hard copy to the session
- And E-mail to:
  - ◆ Grant coordinator (Burrows) at [stepgrantcoor@gmail.com](mailto:stepgrantcoor@gmail.com)
  - ◆ Evaluation Coordinator (Maltbie) at [cathy.maltbie@uc.edu](mailto:cathy.maltbie@uc.edu)
  - ◆ Project Director (Kukreti) [anant.kukreti@uc.edu](mailto:anant.kukreti@uc.edu)
  - ◆ Research Faculty Mentor for your project (E-mail address given earlier)

# RET SITE ACTIVITIES:

## Summary of Deliverables # 1

### ■ Interim Progress Reports & Presentations:

- ◆ Bi-weekly: 1) 2 Written Reports, 2 PowerPoints, and 2 Posters (1 on Research and 1 on Classroom Implementation Plan)
- ◆ Due on alternative weeks (July 2 & July 16)
- ◆ **Typed reports** (one per project):
  - ◆ Research Report: Dr. Kukreti & Research PI
  - ◆ Classroom Implementation Report (2 parts): Dr. Kukreti & Dr. Breiner
- ◆ **PowerPoint presentations** (one per project):
  - ◆ Research PowerPoint: Dr. Kukreti & Research PI
  - ◆ Classroom Implementation PowerPoint: Dr. Kukreti & Dr. Breiner
- ◆ **Posters** (one per project):
  - ◆ Research Poster: Dr. Kukreti & Research PI
  - ◆ Classroom Implementation Poster: Dr. Kukreti & Dr. Breiner



# RET SITE ACTIVITIES:

## Summary of Deliverables # 2

- **7 Final Deliverables**
- **2 Written Reports, 2 PowerPoints, 2 Posters, and 1 Project Summary**

(Email to Dr. Kukreti, Faculty PI, Andrea Burrows, and Ken Maxwell)

- ◆ **Final Day Written Reports** (Emailed & Burned)  
Wednesday, July 28th at 12:00 p.m.
  - ◆ 1 Research Written Report (one per project)
  - ◆ 1 Classroom Implementation Report  
(2 Parts: 1 part per teacher)
- ◆ **Final Day PowerPoints & Posters** (Emailed & Burned)  
Wednesday, July 28th at 6 p.m.
  - ◆ 2 Posters (Final Day: Research-AM (1), Classroom-PM (1))
  - ◆ 2 PowerPoints (Final Day: Research-AM (1), Classroom-PM (1))
- ◆ **Project Summary with 4 Project Photographs** (Emailed & Burned)  
Wednesday, July 28th at 6 p.m.
  - ◆ 1 Summary Report for NSF: 4-5 pages (one per project)
  - ◆ 4 Action Photographs of Project with captions (one per project)

## **RET SITE ACTIVITIES: Field Trips**

- **ARTIMIS, July 7**
- **National Museum of the USAF, July 12**
- **Greater Cincinnati Water Works, July 13**
- **HCDDoES Labs, July 20**

## RET Site Activities:

### Workshop, Seminar & Field Trip Reports

- A designated project group will prepare a write-up on the experience (**see handout**)
- Describe the topics covered and lessons learned (must have sufficient details)
- The report must be submitted within a week after the delivery of the workshop or seminar or field trip
- E-mail the report to:
  - ◆ Anant Kukreti at [anant.kukreti@uc.edu](mailto:anant.kukreti@uc.edu)
  - ◆ Andrea Burrows at [Andrea.burrows@uc.edu](mailto:Andrea.burrows@uc.edu)
  - ◆ Ken Maxwell at [maxwelljrj@gmail.com](mailto:maxwelljrj@gmail.com)

# **RET SITE ACTIVITIES:**

## **Stipends & Awards**

- **Stipend:**  
\$6,000 for in-service teachers  
\$3,000 for pre-service teachers  
(Note: 2 payments; ~August and ~May)
- **Laptop, Case, and Flash Drive**  
(on loan until Post-RET completion)
- **Four CEU credits awarded for RET experience**
- **Parking at UC for 6 weeks (\$112.50/teacher)**
- **Certificate awarded to each participant**
- **\$200 for supplies (receipts/orders go to Burrows)**
- **\$200 to support a RET presentation at a conference**


## RET SITE ACTIVITIES: Post RET Activities

- At least one lesson from RET experience presented by December 2010, but no later than February 1, 2011  
[Note - Needs to be observed! (teacher arranges it)]
- Students fill out Student Activity Feedback Forms after lesson
- Material for web display of lesson: Lesson Plan used for the lesson sent to Andrea Burrows and Ken Maxwell by email  
[Note – Send no later than February 15, 2011]
- 2 Focus group on-campus meetings with Dr. Maltbie:  
~January & ~March
- One-page progress report submitted at ~January meeting
- Submit final reflective report by March 15, 2011 (Final Focus Group)
- Payments will be tied to 6 deliverables, progress report, final report (with tables), and SAFFs (Student Activity Feedback Forms)





# REU Site Activities: Awards

- Certificate for each participant
- “Best Project” selected by Judges in each category:
  - ◆ Written Report – Research
  - ◆ Written Report – Classroom Implementation
  - ◆ PowerPoint – Research
  - ◆ PowerPoint – Classroom Implementation
  - ◆ Poster – Research
  - ◆ Poster – Classroom Implementation

# RET Lesson Web Template

Title of the activity	
<b>Lesson Information</b>	<b>Summary</b>
Grade Level	
Subject areas	
Duration	
Setting	
Materials	
Background Knowledge	<b>Objectives</b>
Lesson Plan(s) for the Activity	
Additional Resources	<b>Ohio Standards</b> Science  Math  Technology

# RET Lesson Web Template

  	
<h2>Viva Las Vegas – An Energy Project</h2>	
Hughes Center High School- Paideia Program <span style="float: right;">Spring 2003</span>	
<p><b>Lesson Information</b></p> <p><b>Grade Level</b> 9</p> <p><b>Subject areas</b> Physical Science</p> <p><b>Duration</b> Six to eleven 50-minute class periods</p> <p><b>Setting</b></p> <ul style="list-style-type: none"> <li>• Standard classroom</li> <li>• Computer laboratory</li> </ul> <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>• Approximately 50 books from library</li> <li>• Poster materials</li> <li>• Computer, w/ LCD projector</li> </ul> <p><b>Background Knowledge</b> Students will need some experience with: watts, joules, energy, work, and energy transformations.</p> <p><b>Additional Resources</b></p> <ul style="list-style-type: none"> <li>• <a href="http://users.rcn.com/apng/ws/EnergyEfficiency.htm">http://users.rcn.com/apng/ws/EnergyEfficiency.htm</a></li> <li>• <a href="http://www.bls.gov/oco/ocos227.htm#outlook">http://www.bls.gov/oco/ocos227.htm#outlook</a></li> <li>• <a href="http://www.howstuffworks.com">www.howstuffworks.com</a></li> <li>• <a href="http://www.doe.gov">www.doe.gov</a></li> <li>• Many other websites</li> </ul>	<p><b>Summary</b> Students act as representatives from competing energy production concerns attempting to sell the Las Vegas City Council a new power plant. The students research their own power generation technology, the technologies of other groups, and the Las Vegas area, in order to write and present a detailed report describing how their power plant will best fit the Las Vegas community. Students are required to learn not only the mechanical facts of how power is generated, but also to evaluate the costs and benefits of such generation.</p>
	 <p>A student presents her research on wind power to the class.</p>
	<p><b>Objectives</b> Students will be able to:</p> <ul style="list-style-type: none"> <li>• Evaluate a power plant technology and its effects on a community.</li> <li>• Demonstrate their ability to research, analyze, and evaluate a topic in a written report and a presentation.</li> </ul>
	<p><b>Ohio Standards</b> From the Ohio Science Benchmarks:</p> <p><b>Earth and Space Sciences</b></p> <ol style="list-style-type: none"> <li>1) Describe how Earth is made up of a series of interconnected systems and how a change in one system affects other systems.</li> <li>2) Explain that humans are an integral part of the Earth's system and the choices humans make today impact natural systems in the future.</li> </ol> <p><b>Physical Sciences</b></p> <ol style="list-style-type: none"> <li>1) Demonstrate that energy can be considered to be either kinetic (motion) or potential (stored).</li> <li>2) Explain how energy may change form or be redistributed but the total quantity of energy is conserved.</li> </ol> <p><b>Science and Technology</b></p> <ol style="list-style-type: none"> <li>1) Explain the ways in which the processes of technological design respond to the needs of society.</li> <li>2) Explain that science and technology are interdependent; each drives the other.</li> <li>3) Predict how human choices today will determine the quality and quantity of life on Earth.</li> <li>4) Design a solution or product taking into account needs and constraints (e.g., cost, time, trade-offs, properties of materials, safety, aesthetics).</li> </ol> <p><b>Scientific Ways of Knowing</b></p> <ol style="list-style-type: none"> <li>1) Explain how societal issues and considerations affect the progress of science and technology.</li> </ol>
<p><b>Developed by Fellows:</b></p> <p style="text-align: center;">Matthew Barber Nicholas Harth</p>	



# Laboratory and Office Usage and Safety

## ■ Attire

- ◆ Closed toe shoes
- ◆ Full length pants
- ◆ Safety glasses, lab coats, and masks when needed
- ◆ Hard hats when needed

## ■ Equipment training and usage

- ◆ Provided by laboratory technician and/or Graduate Research Assistant prior to usage
- ◆ No equipment should be used without receiving training
- ◆ All tools borrowed should be returned before the end of the day

# Laboratory and Office Usage and Safety Issues (Continued)

- **Never work alone when testing**

- **Use of Project Office**

- ◆ Project Office should be kept clean on a daily basis - no exceptions
- ◆ Lock the room after leaving – no exceptions

- **Copy Machine Usage**

- ◆ Limited printing (few pages only) must be done using RET Office printer
- ◆ For larger jobs use department Xerox machine in CEE Office, Baldwin Hall, Room 765
- ◆ RET Office laptop is configured for this printing

**QUESTIONS?**