The University of Tennessee Summer STEM Symposium

July 24th, 2015
10am - 12pm
Min Kao Building

A Showcase of Summer Research by Undergraduates, High School Students & Teachers in Science, Technology, Engineering and Mathematics at UT-Knoxville
3rd Floor
CURENT and TN-SCORE

Purple: TN-SCORE
Green: CURENT REU

STEM Symposium
First Floor
CURENT and Chemistry REU

Red: Chemistry REU
Green: CURENT RET

STEM Symposium
CURENT Research Experience for Undergraduates (REU)

1. Allan Bartlett (University of Kentucky) and Abigail Teron (Universidad del Turabo) - The Comparison of Approximations of Nonlinear Functions Combined with Harmonic Balance Method for Power System Oscillation Frequency Estimation
2. Hayden Dahmm (Imperial College, London) - Optimization of Distributed Storage Locations and Reactive Power Supply for Improved Voltage Variation
3. Christopher Matthews (University of Arkansas) - Modelling an NPCC System with 12.5% Wind Penetration
4. Mark Nakmali (University of Oklahoma) - High Efficiency Power Converters with Gallium Nitride Transistors
5. Shivam Patel (Georgia Institute of Technology) - Optimization of Power Flow through EV Charging
6. Pedro Rivera (Universidad del Turabo) - Thermal Analysis and PCB Design for a GaN Power Transistor
7. Stephen Tang (UNC-Chapel Hill) - Neural Networks for Frequency Disturbance Recorder Signal Classification
8. Michael Breuhl (University of Tennessee-Knoxville) - Flywheels and Power System Stability
9. Joseph Diamond and Richard McEver (University of Tennessee-Knoxville) - Development of a Distributed Matlab Environment and Real Time Data Visualization
10. Joseph Estrada (University of Tennessee-Knoxville) - Load Disaggregation Using Non-negative Matrix Factorization
11. Maeve Lawniczak (University of Tennessee-Knoxville) - Increasing Inductor Power Density Using Controllable Electropermanent Magnets

TN-SCORE

12. Adam Spannaus (University of Tennessee-Knoxville) - Accelerating Material Design for Catalysts with High-throughput Computing
13. Katelyn Hodge (University of Tennessee-Knoxville) - Realistic Quantum Chemical Modeling of Platinum Fuel Cell Catalyst
14. Eon Burkett (TN State University) - Synthesis and characterization of novel penta-block copolymers for high conductivity durable anion conducting membranes
15. Gabriela Little (University of Tennessee-Knoxville) - Production, Purification, and X-Ray Crystallography of the POTRA Domains of PsToc75
16. Patrick Jung (University of Tennessee-Knoxville) - Concentration Effects on Observed Electron Transfer Rates in Photosystem I
17. Christopher Neal (University of Tennessee-Knoxville) - Effect of High Surface Area Carbon Addition to the Performance of a Non-Precious Metal Catalyst in a PEM Fuel Cell
18. Mary McBride (University of Tennessee-Knoxville) - Cathodic and Anodic Reaction Order with Respect to Zincate for Zn-Air Battery
19. Grayson Jones (University of Tennessee-Knoxville) - Next Generation Materials for Organic Photovoltaics
CURENT Young Scholars Program (YSP)

20. Diane Kim (Farragut High School) - Monitoring Blood Glucose Concentration Levels for Diabetes Using LabView
21. Cameron Jeske (Hardin Valley Academy), Emily Threatt (Christian Academy of Knoxville) - Exfoliation and Synthesis of 2D Materials
22. Christine Garcia (Lenoir City High School) and Blair Johnson (West High School) - Brazilian Blackout of 2009
23. Vinila Baljepally (Bearden High School) and Emily Thompson (Knoxville Catholic High School) - A Photoplethysmography Based Heart-rate Monitoring System
24. Allison Campbell (Bearden High School) - Monitoring Breathing Signals in Sleep Apnea Patients Using LabVIEW
25. Jasmine Park (Farragut High School) - Energy Use and Thermal Comfort in the Workplace
27. Jack Baldwin (L&N Academy) - Power System Generation Expansion Plan
28. Breanna Piercy (Hardin Valley Academy) and Noelani Fishman (West High School) - Analysis of Naturalistic Electric Bike Rider Behavior: Energy and Power Considerations

Office of Research

29. Quentin Eustace (University of Tennessee-Knoxville) - Perovskite Crystal Growth
30. Jenny Patel (University of Tennessee-Knoxville) - Elucidating Sex-Related Differences in Calcification of Rat Aortic Heart Valves

NIMBioS

31. Michael Rohly (Columbus State University), Talon Johnson (Morehouse College), Januka Khanal (Southeastern Louisiana University), Nick Sirek (L&N STEM Academy) - Exploring Host-Pathogen Interactions with Agent-Based Models in Netlogo
32. Ashley Dantzler (University of Tennessee-Chattanooga), Margaux Hujoel (Harvey Mudd College), Virginia Parkman (University of Tennessee-Knoxville), Ayana Wild (Tennessee State University) - Canine Distemper Outbreak Modeled in an Animal Shelter
33. Riley Mummah (The Pennsylvania State University), Diya Sashidar (North Carolina State University), Jinchuan Wei (University of Minnesota) - Discriminating between alternative mechanisms of formation of mycobacterial granulomas in vitro
34. Yilin Lin (Emory University), Mariel Bedell (Carnegie Mellon University), Emmie Román-Méndez (University of Puerto Rico Mayaguez) - Modeling the distribution of fluid pressure in the kidney
35. Nathan Wikle (Truman State University), Ryan Yan (College of William and Mary), Ashish Gauli (Fisk University) - Projecting domestic species invasion spread using commodity flow pathways
**Chemistry Research Experiences for Undergraduates (REU)**

36. Ian Bencomo (Rochester Institute of Technology) - Studies Towards the Synthesis of Axially Coordinating Ligands for Rhodium (II) Paddlewheel Complexes

37. Laney Browder (Western Carolina University) - Synthesis of 4-Azidobutyl Myo-inositol for Labeling Inositol Metabolites

38. Natalie Dunn (Aquinas College) - Assessment of Ecological Changes based on Image Analyses of Microalgae Cells

39. Kaitlin Hewitt (Jackson State University) - Digging Into Soil Lipidomics

40. William Maximuck (Millersville University of Pennsylvania) - Synthesis of a Macro cyclic Tetracarbene Chromium Catalyst for Aziridination Reactions

41. Matthew Nisbet (Centre College) - Potential Energy Surface of the Ne-HBr van der Waals Dimer

42. Jake O’Leary (Birmingham-Southern College) - Development of a Lipid Probe for Discovering Lipid-Binding Proteins

43. Brendan Phillips (Ursinus College) - Redox-Active Catalysts for Polymerization of Olefins and Lactide

44. Tony Saucedo (Simpson College) - Life in a Vacuum: Surface Analysis of Thin Films

45. Sharon Ayioka (University of North Carolina at Pembroke) - Carotenoids And Their Affect on Small Molecule Transport Across Membranes

46. Nicole Sikes (Columbus State University) - Physicochemical Adsorption vs. Covalent Bonding: a Nanocomposite Story

47. Kaelyn Warne (The College of William and Mary) - Improving Industries: Adsorption of Cyclopentane on MgO and Graphite

48. Branford Wilkins University of South Carolina at Columbia) - Development of a Novel Nanoparticle-Based Cell Imaging System

49. Becky Wombacher (Truman State University) - Metabolic Impact of TCA Cycle Gene Mutations in E. coli

**CURRENT Research Experience for Teachers (RET)**

E Debbie Frasier (Farragut High School) - Chemistry Connections on the Grid & the Generation Gap

E Brian Hardison (Pi Beta Phi Elementary School) - Chemistry of Metallic Properties

E Jill Lawrence (Gresham Middle School) - “Renewing” the 7th grade Science Class Lessons for a Cross-Curricular Experience

E Tracy Marston (Northwest Middle School) and Jessica Smith (South Doyle Middle School) - Simple Circuits and Renewable Resources

E Lauren Migun (Bearden High School) - Geometry Within Electrical Engineering

E Jessica Minton (Riverdale Elementary School) - Connecting Solar to the Grid

E Laura Roberts (West High School) - Analyzing Correlations: Climate Change Impacts Renewable Solutions

E Eric Stansberry (Gresham Middle School) - Electrifying STEM

E Jason Wright (Fulton High School) - Connecting High School CTE Students to the Grid
JISC
E Kiki Ng (The Chinese University of Hong Kong) – Parallel Computation for Discontinuous Galerkin Method
E Ashley Cliff (Central College) – Dynamic Power System Analysis
E Helsa Chan (The Chinese University of Hong Kong) – A Multi-Objective Stochastic Programming Model for Disaster Relief Logistics under Uncertainty
E Huanbo Jiang and Zhiyao Xie (City University of Hong Kong) – MD Simulation of Melittin in DMPC Bilayer
E Jacob Blazejewski and Krystle Reiss (Alma College) – Graphene Sheet Simulation using DFTB
E Nick Moran (UTK) and Tanner Curren (Maryville College) – Multiphysics Simulation Using openDIEL
E Gerard Vanloo and Kison Osborne (Morehouse College) – Using HPC to Simulate Cellular Embryogenesis
E Tyler McDaniel (University of North Carolina, Asheville) and Ming Wong (University of South Carolina) – GPU QMC Optimization Using QR Factorization

Instruction for Presenters:
10:00am – 11:00 am: odd number poster presentations
11:00am – 12:00 pm: even number poster presentations