

**Midstates Consortium for Math and Science
Undergraduate Research Symposium
Physical Sciences, Mathematics, and Computer Science
Washington University
October 31 – November 1, 2014**

Program Schedule

Friday, October 31 All Friday evening events are at the Sheraton Clayton Inn – Fleur de Lys room

5:00 – 6:30 pm **Registration**

6:30 – 7:45 pm **Dinner buffet**

7:45 – 8:00 pm **Welcome**

John Bleeke, Symposium Organizer
Washington University in St. Louis
&
Brandy Russell, Director
Midstates Consortium for Math and Science
Gustavus Adolphus College

8:00 – 9:00 pm **Janet Anderson Award Lecture**

Kevin Crosby, professor of Physics & Astronomy and Computer Science
Carthage College
2014 Janet Andersen Award Winner in the
Physical Sciences, Math, & Computer Science
“Backdoor astronaut: What happens after you’re rejected by the Astronaut Corps”

Saturday, November 1

7:15 – 8:00 am Breakfast buffet at hotel

**Sheraton Clayton Inn
Fleur de Lys room**

**8:00 – 8:15 am Load bus & vans – depart at 8:15 am sharp for
Washington University Campus**

**Meet in Sheraton
Clayton lobby**

Those groups with cars or vans should drive themselves; bus transportation has been arranged for everyone else. If you are not staying at the hotel Saturday night, please bring your luggage.

Saturday, November 1 Meeting continues on Washington University Campus

8:45 – 9:30 am	Oral Presentations of Student Papers Session A: Session B:	LabSci Building Room 300 Room 250
9:30 – 9:45 am	Group Picture	
9:45 – 10:00 am	Break & Poster Session 1 set-up	
10:00 – 10:45 am	Oral Presentation Sessions A and B, continued	Same rooms
10:45 – 11:45 am	Poster Presentations – Session 1	Rettner Gallery & 3rd Floor Hallway
12:00 – 1:30 pm	Lunch & Panel Discussion “Life in Graduate School” Graduate Student Panelists: Kei Fuchigami, Chemistry Nara Higano, Physics Xiaochen Mao, Earth & Planetary Sciences Jason Schultz, Chemistry John Schmidt, Mechanical Engineering & Materials Science Brian Wieliczka, Chemistry	Holmes Lounge
1:45 – 2:45 pm	Oral Presentations of Student Papers Session C: Session D: Session E:	LabSci Building Room 300 Room 250 Room 201
2:45 – 3:00 pm	Break & Poster Session 2 set-up	
3:00 – 3:45 pm	Oral Presentation Sessions C, D, and E, continued	Same rooms
3:45 – 4:45 pm	Poster Presentations – Session 2	Rettner Gallery & 3rd Floor Hallway
4:45 – 5:00 pm	Concluding Remarks Complete evaluations & pick up dinner to go	
5:00 pm	Meeting Concludes Bus leaves for Sheraton Clayton Inn at 5:15 pm	

SESSION A – Saturday, 8:45am

Room: LabSci 300

# of Presenter	Presenter Name	College / University	Title of Presentation
A.1 (8:45)	Josh Portner	Gustavus Adolphus College	Methylmercury Photodemethylation
A.2 (9:00)	Tabbatha Bohac	University of Chicago	Toward the Synthesis of a Multi-Metallic Polymerization Catalyst
A.3 (9:15)	Alyssa Wall	Carthage College	An NMR Investigation of the Effects of pH on Aggregation of Amino-Acid-based Surfactants
Photo & BREAK 9:30 – 10:00 am			
A.4 (10:00)	Cameron Holder	Hope College	Determining the Growth Mechanism of Thermoelectric PbTe Nanoparticles by Modified Polyol Synthesis
A.5 (10:15)	Kristine Ma	University of Chicago	Nanoscale Coordination Polymers for the co-delivery of siRNAs and cisplatin
A.6 (10:30)	Emily Reeves	St. Olaf College	Synthetic Methods for Hybrid PVP-Cysteine Coated Silver Nanowires

SESSION B – Saturday, 8:45am

Room: LabSci 250

# of Presenter	Presenter Name	College / University	Title of Presentation
B.1 (8:45)	Yu Tao Li	Washington University in St. Louis	Phase cancellation in ultrasonic measurements due to misalignment of receiving transducer
B.2 (9:00)	Spencer Batalden & Will Doebler	Gustavus Adolphus College	A Non-contact Method of Modal Excitation by the Acoustic Radiation Force of Ultrasound
B.3 (9:15)	Zach Stottler & Ryson Stuart	Luther College	Studies of Charm Meson Production in Bottomonium Decay
Photo & BREAK 9:30 – 10:00 am			
B.4 (10:00)	Estiaque Haidar Shourov, Dinesh McGinty, Julian S. Vanacek, & Noah DeTal	Beloit College	Difficulties and opportunities restoring a 0.5 MeV Van de Graaff Proton Accelerator
B.5 (10:15)	Erik Gustafson	Knox College	Design of a temperature controller for investigating phase transitions in liquid crystals
B.6 (10:30)	Daniel Martinez	Lawrence University	Atomic Force Microscopy of Liquid Crystal Films

SESSION C – Saturday, 1:45pm

Room: LabSci 300

# of Presenter	Presenter Name	College / University	Title of Presentation
C.1 (1:45)	Monica Ohnsorg	Hope College	How Does the Framework Form? Layer-by-Layer Characterization of HKUST-1 SurMOF Growth
C.2 (2:00)	Stephanie Zack	Carthage College	An Investigation of the Mechanism of Chiral Recognition by Molecular Micelles with Molecular Dynamics Simulations
C.3 (2:15)	Tim Bumpus	Luther College	A Real Chemical Connection: The Synthesis of Supramolecular Side Chain Functionalized poly(Oxynorbornene)s via ROMP
C.4 (2:30)	Brandon Bowser	Hope College	Preparation and Characterization of Surface Anchored Metal-Organic Frameworks
BREAK 2:45 – 3:00 pm			
C.5 (3:00)	Grant Forsythe	Lawrence University	An Infrared Study of Hydrogen Bonding in 1-alcohol systems
C.6 (3:15)	Caren Sullivan	Lawrence University	Dipole density: a molecular picture of salt in alcohols
C.7 (3:30)	Margaret Dickinson	Hope College	Development of a Novel Method to Measure Perfluorinated Compounds

SESSION D – Saturday, 1:45pm

Room: LabSci 250

# of Presenter	Presenter Name	College / University	Title of Presentation
D.1 (1:45)	Satcher Hsieh	Washington University in St. Louis	High sensitivity microwave power detection via driven superconducting qubit
D.2 (2:00)	Mikaela Algren	Gustavus Adolphus College	Ion Reaction Studies in a Linear Quadrupole Trap
D.3 (2:15)	Ariel Matalon	University of Chicago	Development of a prototype for Fluorescence detector Array of Single-pixel Telescopes
D.4 (2:30)	David Pfothenhauer	Luther College	Searching for Secular Evolution in Semi-Regular Variable Stars
BREAK 2:45 – 3:00 pm			
D.5 (3:00)	Emily Witt	St. Olaf College	Variability of Astronomical Sources in the Microwave Sky
D.6 (3:15)	Ratuja Reddy	University of Chicago	Lightcurves of Supernova 2005kd and Supernova 2006jd
D.7 (3:30)			

SESSION E – Saturday, 1:45pm

Room: LabSci 201

# of Presenter	Presenter Name	College / University	Title of Presentation
E.1 (1:45)	Srichandra Masabathula	Knox College	Simulation in Valuation of Exotic Options
E.2 (2:00)	Sarah McConnell	University of Chicago	Delta sets of numerical semigroups
E.3 (2:15)	Sam Hart & David Rincon-Cruz	Knox College	Implementation of an automated geometry theorem prover in Mathematica
E.4 (2:30)	Tyler Ellison	Washington University in St. Louis	Geometric Theory of Boundary Value Problems for Schrödinger Operators
BREAK 2:45 – 3:00 pm			
E.5 (3:00)	Toby Baratta & Bo Wang	Grinnell College	Toponym Recognition on Historical Maps with Linear/Shape Feature Alignment
E.6 (3:15)	Jimmy Xia	University of Chicago	Effect of Spatial Pooler Initialization on Column Activity in Hierarchical Temporal Memory
E.7 (3:30)	Eddie Elizondo	Lawrence University	Ensemble Learning for Student Retention Prediction

Poster Session 1. 10:45 – 11:45 am

Poster #	Name	College/University	Poster Title
1.01	Noah DeTal, Dinesh McGinty, Estiaque Haidar Shourov, & Julian S. Vanacek	Beloit College	Operation of a 0.5 MeV Linear Van de Graaff Proton Accelerator
1.02	Aaron Scheets	Carthage College	A Robust Protocol for the CAERENet Field Mill Instrument
1.03	Jarod Rutledge	Colorado College	Reviving African Sleeping Sickness Research
1.04	Daniel Lee	Grinnell College	Synthesis and Characterization of Molybdenum(VI) Oxido-Imido Complexes with N-Salicylidene-2-aminophenol (saph ₂) and N-Salicylidene-2-aminothiophenol (smaH ₂) Ligands
1.05	Samantha Pilicer	Grinnell College	The Design and Asymmetric Synthetic Studies of Ajmalicine Analogues
1.06	Brian Voigt	Gustavus Adolphus College	
1.07	Colleen Caldwell	Gustavus Adolphus College	Characterization of cadmium binding in Metalloprotein II
1.08	Guillermo Turcios	Gustavus Adolphus College	Characterization of Fe ³⁺ -pyrazole Coordination Complexes
1.09	Scott Anderson	Gustavus Adolphus College	Photodegradation of Imidazolinone Herbicides and Pesticides in Aqueous Solutions and on Plants Surfaces
1.10	Drake Neilands	Hope College	The Preparation and Electropolymerization of Functionalized EDOT Monomers to Explore Surface and Electrochemical Properties
1.11	Mike Supej	Knox College	Synthesis and characterization of α -diimine iron complexes for the hydrosilylation of unsaturated hydrocarbons
1.12	Nicolete Laird	Knox College	Developing a quantitative model to describe the SRM Network in <i>Saccharomyces cerevisiae</i>
1.13	Dylan Winston	Luther College	Effect of spin polarization and Fermi energy on spin torque in Néel walls
1.14	Reed Johnson & Claire Seitzinger	Luther College	Fatty Acid Derived Lactones: New Monomers for the Production of Bioplastics
1.15	Chao Ouyang	St. Olaf College	Spectral Analysis of Atomic Gadolinium

Poster #	Name	College/University	Poster Title
1.16	Daniel Timothy Hickox-Young	St. Olaf College	Spin Hall Effect Based Magnetic Tunnel Junction Logic Devices
1.17	Emily Johnson & Lucas Sletten	St. Olaf College	Frictional properties of commercial hard disk coatings: Understanding the forces inside high speed, microscopic contacts
1.18	Calvin Deutschbein	University of Chicago	Performance and Energy Limits of a Processor Integrated FFT Accelerator
1.19	Aidan Sadowski	University of Chicago	Statistical Emulation of General Circulation Models of Climate Change
1.20	Daniel Parker	University of Chicago	Elliptic Curves and Lenstra's Factorization Algorithm
1.21	James Gilhula	University of Chicago	Growth of Zinc Oxide Nanocones for Use in Neutron Detection
1.22	Fangzhou Xiao	Washington University in St. Louis	Constrained Bayesian Optimization on Set Functions

Poster Session 2. 3:45 – 4:45 pm

Poster #	Name	College/University	Poster Title
2.01	Charlene Hoffman	Carthage College	Molecular Dynamics Simulations of the Association of Atenolol and Propranolol with a Chiral Molecular Micelle
2.02	Mike Brusich	Carthage College	An improved low-noise amplifier design for the CAERENet instrument
2.03	Kate Klesner	Grinnell College	Identification and Quantification of Heavy Metal Isotopes in Historic Human Remains using ICP-MS
2.04	Malachi Wickman	Grinnell College	Design and Synthetic Investigations towards the Asymmetric Synthesis of Melodinines
2.05	Jason Vrosh	Hope College	The Preparation of Ferrocene and Porphyrin Functionalized EDOT Films for Electrochemical Sensing
2.06	Anh Phan	Knox College	Magnetic characterization of novel molecules
2.07	Brad Musselman	Knox College	Axial Site Reactivity of Copper(II) Carboxylate Metallomesogens

Poster #	Name	College/University	Poster Title
2.08	Eve Martinez & Gina Tran	Knox College	Preparation, Characterization, and Reactivity Studies of Iron Complexes Supported by Conjugated Tridentate Ligands
2.09	Mike Sprinkle	Knox College	Synthesis and Characterization of Intriguing Manganese(II) Compounds
2.10	Amanda Hayden	Luther College	An exploration of single electron capture by bare ions from water molecules
2.11	Emily Mueller & Robert Starr	Luther College	Development in Undergraduate Organic Chemistry Laboratory Curriculum
2.12	Suzy Kirch	St. Olaf College	Effects of reduced heat conduction and alpha range on inertial confinement fusion implosions
2.13	Jordan Dull	St. Olaf College	Simulation of a transmission x-ray microscope and image analysis
2.14	Katherine Oosterbaan	University of Chicago	Synthesis of Poly(amide-b-ester)-Based Aerogels
2.15	Payton Weidenbacher	University of Chicago	Analysis of Cytosine Modification Through Array Based Detection
2.16	Jacob Britz	University of Chicago	Phase Diagram and Equations of State for High Pressure Polymorphs of ZrSiO ₄
2.17	Jake Russell	University of Chicago	Modifying polyethylenimine for anti-TB applications
2.18	Jerry Chee	University of Chicago	Investigating the Effects of Microstructure Patterns on the Optical Performance of Iron Oxide Pixel Devices
2.19	Channing Hunter	Washington University in St. Louis	The Chemical Reduction of Carbon Dioxide Using Gaseous Copper Anions