

2010 Undergraduate Research Symposium

Program Schedule

Friday, November 12, 2010

5:00 – 6:30 p.m.	Registration	Sheraton Clayton Plaza – Lobby
6:30 – 7:30 p.m. 7:30 p.m.	Buffet Dinner Greetings Professor John Bleeke, Symposium Organizer, Washington University and Professor Karen N. Pearson Director, Midstates Consortium Hope College	Sheraton Clayton Plaza – Ballroom
7:45 – 9:00 p.m.	Program <i>“Life as a Graduate Student: Could this be the next step for you?”</i> Panel participants Andy Surface - Chemistry graduate student Jasmine Ng - Math graduate student Garrecht Metzger - Earth and Planetary Sciences grad student Michelle Milne - Physics post-doc	Sheraton Clayton Plaza – Ballroom
	Refreshments – Let’s Meet!	Sheraton Clayton Plaza – Ballroom

Saturday, November 13, 2010

Morning Session:

7:15 – 8:00 a.m.	Continental Breakfast	Sheraton Clayton Plaza
8:15 a.m.	Transportation to Washington University Campus	
8:45-10:00 a.m.	Oral Presentations of Student Papers (Parallel Sessions)	Laboratory Sciences Building Session A – Lab Sciences 250 Session B – Lab Sciences 201
10:00 - 10:15 a.m.	Break	Second Floor, Lab Sciences Building
10:15 – 11:00 a.m.	Oral Presentations of Student Papers (Parallel Sessions) Invited Lecture Professor Liviu Mirica	Laboratory Sciences Building Session A – Lab Sciences 250 Session B – Lab Sciences 201
11:15a.m. – 12:15 p.m.	Department of Chemistry, Wash U <i>“Late Transition Metal Catalysts for the Activation of Small Molecules: Relevance to Renewable Energy Catalysis”</i>	Laboratory Sciences Building, Room 300

Afternoon:

12:15 – 1:00 p.m.	Pizza Lunch	Rettner Gallery of Lab Sciences Building, 3 rd Floor
1:15 p.m.	Transportation to Hotel	
1:45 p.m.	Transportation Leaves Hotel for Zoo, Art Museum and Arch	
4:45 p.m.	Busses leave venues to return to the hotel	
6:00 p.m.	Transportation to Washington University Campus	

Evening Session:

6:30 – 7:45 p.m.	Dinner (Assigned tables)	Holmes Lounge, Washington University Campus
8:00 – 9:00 p.m.	Poster Session I	Rettner Gallery of Lab Sciences Building, 3 rd Floor
9:15 p.m.	Transportation to Hotel	

Sunday, November 14, 2010**Morning Session:**

7:15 – 8:00 a.m.	Continental Breakfast Check out of Hotel	Sheraton Clayton Plaza
8:15 a.m.	Transportation to Washington University Campus on the bus or in your group's cars and vans	
8:45-9:30 a.m.	Oral Presentations of Student Papers (Parallel Sessions)	Laboratory Sciences Building Session C – Lab Sciences 250 Session D – Lab Sciences 201
9:30 – 9:45 a.m.	Break and poster set-up	Third Floor, Lab Sciences Building
9:45 – 10:45 a.m.	Poster Session II	Rettner Gallery of Lab Sciences Building, 3 rd Floor
10:55 – 12:00 p.m.	Professor Graham Peaslee Janet Andersen Award Lecture Department of Chemistry and Environmental Science Hope College <i>“Ion Beam Analysis: from Mud to Luminescence”</i>	Laboratory Sciences Building, Room 300
12:00 p.m.	Complete meeting evaluation	
12:00 p.m.	Final Thank Yous	
12:00 p.m.	Box Lunches Available	Rettner Gallery, Lab Sciences Building
12:15 p.m.	Symposium Adjourns	
12:15 p.m.	Transportation to Airport	

**2010 Janet Andersen Lecture Award Winner
Dr. Graham Peaslee, Hope College, Holland, MI**

Lecture Title: Ion Beam Analysis: from Mud to Luminescence

Abstract: Given a small particle accelerator, there are a variety of ion beam analysis techniques available to study materials, environmental questions, electrochemistry and even forensic science questions. An overview of several common techniques such as Particle Induced X-ray Emission, Rutherford Backscattering and Ion Beam Induced Luminescence will be presented, together with their applications in a wide variety of disciplines. Recent results that show the transformative nature of the research possible when interdisciplinary collaborations occur will be highlighted. All of this science is not only accessible to the undergraduate researcher, but particularly useful in training students to think broadly about their own disciplinary problems.

Biographical and Award Information: Professor Graham Peaslee came to Hope College in 1993 after earning an undergraduate degree from Princeton University and a Ph.D. from the State University of New York, Stony Brook. Graham has a joint appointment in the Departments of Chemistry and Geological and Environmental Sciences (GES) at Hope College in Holland, MI. He is currently the chair of the Chemistry Department and teaches courses in chemistry and GES and maintains research collaborations with members of both the physics and biology departments. Graham's diverse research interests are all related by the use of a range of powerful analytical tools associated with the Hope College Ion Beam Analysis Laboratory. This particle accelerator facility allows Graham and his student, faculty and staff colleagues to perform quantitative elemental analysis on solid, liquid and even aerosol particulate samples.

In the nomination letter signed by six of Graham's colleagues in the Natural and Applied Sciences Division, Professor Seymour wrote, "He is driven to help students and faculty investigate challenging interdisciplinary scientific questions using whatever resources are most appropriate for the problem at hand. For example, he has taught students how to use the particle accelerator in physics for x-ray analysis of metals in lake sediments for a geology project, another group of students have used the physics-based techniques of Rutherford backscattering to investigate the thickness of an electrochemical sensor for an analytical chemistry project and he has worked with students in the environmental science program to do classical colorimetric chemical tests for the measurement of phosphorous in local ponds. There is no doubt that Graham is a dynamic force in providing students with relevant and challenging research experiences and that he is successful in helping students develop confidence in their ability to do meaningful research."

The letter goes on to say that "Graham provides inspiration, great ideas and proven methods for successful teaching and research in an undergraduate setting. He knows what it takes to achieve goals that have been established. Graham often makes the sports analogy that Hope is a D-III school with a D-I research program. This is in large part due to the impact that he has not only on the students he works with, but also on the faculty colleagues with whom he works."

SESSION A – Saturday AM

Facilitator: Dr. Britt Scharringhausen, Physics Department, Beloit College

Laboratory Sciences Building, Room 250

# of Presenter	Presenter Name	College / University	Title of Presentation
A.1 (8:45)	Morgan Rehnberg	Beloit College	“The Shapes of Three Small Moons of Saturn”
A.2 (9:00)	Samuel Storck-Post	Beloit College	“Saturn's F Ring in VIMS Observations of a Cassini Ring-Plane Crossing”
A.3 (9:15)	Amber Bakkum and Kimberly Schultz	Carthage College	“Study of Fluid Dynamics for the Orion Service Module Downstream Propellant Tanks”
A.4 (9:30)	Sean Lourette	Washington University in St. Louis	“Recovery, Purification, and Reuse of ^3He Gas for NMR Lung Imaging”
A.5 (9:45)	Elly Earlywine	Hope College	“Cathodoluminescent Signatures of Neutron Irradiation”
BREAK (10:00-10:15)			
A.6 (10:15)	Kristen Hasbrouck	Hope College	“Analysis of Phosphates in Sediments”
A.7 (10:30)	Brian Van Hoozen and Carol Bodnar	Lawrence University	“How Strong Are Your Cells' Skeletons?: Measuring the Stiffness of Microtubules as a Function of Diameter”
A.8 (10:45)	Ben Keisling and Lauren Snyder	St. Olaf College	“Preparations for Surface-Based Geophysical Exploration of Subglacial Lake Whillans”

SESSION B – Saturday AM

Facilitator: Dr. Stefan Erickson, Mathematics Department, Colorado College

Laboratory Sciences Building, Room 201

# of Presenter	Presenter Name	College / University	Title of Presentation
B.1 (8:45)	Benjamin Simmons	St. Olaf College	“The Untold Story of Lord Kelvin and the Origin of Monte Carlo Methods”
B.2 (9:00)	Anna Scott	The University of Chicago	“Stability Analysis and the Role of Non-Self Adjointness”
B.3 (9:15)	Sam Estrem	Lawrence University	“Heuristic Search Techniques”
B.4 (9:30)	Michael Noltner	Luther College	“Zero-inflated count regression models with application in Psychology”
B.5 (9:45)	Last Feremenga	The University of Chicago	“Magnetic Field Mapping”
BREAK (10:00-10:15)			
B.6 (10:15)	Michael Post	Washington University in St. Louis	“Fabrication of a Device for Direct Electrical Detection of Protein at the Microscale”
B.7 (10:30)	Stephanie Finnvik	Carthage College	“Elijah Balloon Payload Project 2010”
B.8 (10:45)	Opeoluwa Matthews	Luther College	“A Tribological Study of Self-Assembled Monolayers on MEMS-type Materials”

SESSION C – Sunday AM

Facilitator: Dr. Jay Stork, Chemistry Department, Lawrence University

Laboratory Sciences Building, Room 250

# of Presenter	Presenter Name	College / University	Title of Presentation
C.1 (8:45)	Timothy Hamerly	Carthage College	“Probing the motion of chiral molecules bound to molecular micelles using NMR spectroscopy”
C.2 (9:00)	Colin Rathbun	Hope College	“Kinetic Studies of C-C Bond Activation in Quinolinyl Ketones”
C.3 (9:15)	Meareg Amare and Jasmine Hamid	Lawrence University	“The Synthesis of Novel Cobalt Alkyne Complexes and Their Effect on Human Breast Adenocarcinoma Cells”

SESSION D – Sunday AM

Facilitator: Dr. Heriberto Hernandez-Soto, Chemistry Department, Grinnell College

Laboratory Sciences Building, Room 201

# of Presenter	Presenter Name	College / University	Title of Presentation
D.1 (8:45)	Laura Mertens	Grinnell College	“Gas Phase Hydrogen/Deuterium Exchange of Arginine-Containing Peptide Alkali Metal Complexes”
D.2 (9:00)	David Frempong	Lawrence University	“Photochemical Reactivity of Humic Substances in the Presence of Nitric Acid”
D.3 (9:15)	Mulu Asmare Kebede	Lawrence University	“Photochemistry of nitric acid on fly ash and volcanic ash particles”

POSTER SESSION 1

Undergraduate Research Symposium

Please put your poster up anytime Saturday morning or early afternoon in the Lab Sciences Foyer and Hallways and leave it up until the end of the poster session on Saturday evening.

Presenters should stand by their posters from 8:00 – 9:00 p.m. on Saturday, November 13.

# of Poster	Student Presenter(s)	College / University	Poster Title
P1.1	Mohammed Hussain	Augustana College	Mixed Metal Oxides in Claisen-Schmidt Reactions and Robinson Annulations
P1.2	Amanda Meyers	Augustana College	2-Dimensional NMR Study of AFB1-FAPY Intercalated Oligonucleotides
P1.3	Susan Craig	Carthage College	Probing Intermolecular Interactions in Chiral Chromatography with NMR Spectroscopy
P1.4	Kristen Jones and Daniel Noffke	Carthage College	Monitoring Chloride Concentrations of the Pike River in Southeastern Wisconsin
P1.5	Leann Quertinmont	Carthage College	Synthesis of Enantioselective Chiral NMR Shift Reagents
P1.6	Douglas Vodnik	Carthage College	The Young's Modulus of Single-Walled Carbon Nanotubes
P1.7	Emily Blythe	Grinnell College	Use of lysine derivatives in biomimetic IKVAV peptide surfaces
P1.8	Tianxiang Lui	Grinnell College	Computational Study of NO ₂ Decomposition over Modified Cu-FAU Zeolite
P1.9	Andrew Marcum	Grinnell College	Magnetic anisotropy and Metamagnetism in a novel rare earth tin germanide
P1.10	Ana Mancebo	Grinnell College	Synthesis and Characterization of Molybdenum (VI) Imido Complexes with N-salicylidene-2-aminophenol

P1.11	Tianqi Zhang	Grinnell College	Computational Study of the Formation of CH ₂ NH ₂ in the Gas Phase and on Water Clusters
P1.12	Olajide Banks and XiSen Hou	Hope College	Chemically Modified Electrodes: determining thin film thickness
P1.13	Kyndra Sluiter	Hope College	New GC/MS and potentiostat and their applications to photochrome research
P1.14	Chelsea Coley	Knox College	Synthesis and Characterization of mixed ligand complexes of Copper (II) butanoate
P1.15	Effrat Fayer	Knox College	Synthesis of Biologically Active Phosphonates From Castor Oil
P1.16	Sylwia Matlosz	Lawrence University	Platinum(II) Dipyrinato Complexes: Unexpected Reactivity and Structure
P1.17	Mary Crumley and Kristen Indrelie	Luther College	Detecting Trace Amounts of Environmental Pollutants via Fluorescence Spectroscopy
P1.18	Nicholas O'Connor	Macalester College	Investigations into Chroman Synthesis via Gold-Catalyzed Hetero-Diels-Alder Reactions of ortho-Quinone Methides
P1.19	Elena Tonc	Macalester College	Quantum Mechanical Simulations of Reactions Between Ozonolysis Intermediates and Water
P1.20	Emily Ulrich	Macalester College	The Synthesis and Stereochemistry of Gamma-Amino Acid-Containing Oligomers
P1.21	Noah Mitchell	St. Olaf College	Measurement of Atomic Transition Probabilities for Neutral Cerium
P1.22	Allison O'Connell	Colorado College	Thermodynamics of U6 Internal Stem Loop
P1.23	Shane Strom	Colorado College	Thermodynamic Stability and Divalent Ion Interactions of RNA Containing Purine-Rich Bulges

P1.24	Geoffrey Delperdang	St. Olaf College	Cryogenic Dark Matter Search Background Analysis
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POSTER SESSION 2			
Undergraduate Research Symposium			
Please put your poster up first thing Sunday morning in the Lab Sciences Foyer and Hallways and leave it up until the close of the Symposium at noon.			
Presenters should stand by their posters from 9:45 – 10:45 a.m. on Sunday, November 14.			
# of Poster	Student Presenter(s)	College / University	Poster Title
P2.1	Jeffrey Batt	Augustana College	The preparation of 3-substituted 1,5-dibromopentanes as intermediates for tetrahydrothiopyrans
P2.2	Christina Konecki	Carthage College	Lifetime Prediction of Mg-Rich Coatings Using Fluoro-Magnesium Probes
P2.3	Sarah Marble	Carthage College	Investigation of Interactions between β -blocker Drugs and Polymers via NMR Diffusion Experiments
P2.4	Kimberly Schultz and Amber Bakkum	Carthage College	Study of Fluid Dynamics for the Orion Service Module Propellant Tanks
P2.5	Shuming Chen	Grinnell College	Computational Study of Gas-Phase Serine Clusters
P2.6	Ian McCallum-Cook	Grinnell College	Crystal Structure of a Novel Rare Earth Tin Germanide
P2.7	Ana Ortega	Hope College	Rate performance of three dimensionally ordered macroporous carbon based electrodes in aqueous $K_3Fe(CN)_6$
P2.8	Travis Helgren	Knox College	Characterization Of Two Novel Chloride Bridged Tetrameric Copper(II) Clusters By X-Ray Diffraction

P2.9	Kallie Brynn Doeden	St. Olaf College	Green Chemistry in Education
P2.10	Valerie Tripp	Macalester College	Copper-binding Properties of the BIR2 and BIR3 domains of X-linked Inhibitor of Apoptosis Protein
P2.11	Kevin Sullivan	Macalester College	Anionic Group VI Metal Carbonyls with Bis(diphenylphosphinomethyl)di phenylborate Ligands: Potential Precursors for Sulfene Transfer Reagents
P2.12	Patrick Henneghan	St. Olaf College	Successive Deposition of Ag on Ag Nanoplates: Lateral vs. Vertical Growth
P2.13	James Jaffe	St. Olaf College	Presence of Metals in Storm Water Runoff
P2.14	Timothy Wiser	Washington University in St. Louis	Phase Transitions in the PT-Symmetric Z(3) Model
P2.15	Nathan Eigenfeld and Christopher Bousein	St. Olaf College	Studying friction, wear, and lubrication for a new generation of microscopic machines
P2.16	Haley Phillips	St. Olaf College	Synthesis of Novel Transition Metal Dithiolene Complexes
P2.17	Mengyi Cao	Colorado College	Mathematical Modeling of Quorum Sensing System in Marine Bacteria <i>Vibrio fischeri</i>
P2.18	Bryce Ingram	Colorado College	Optical Spectroscopic Quantification of Capsaicinoid Content in Chili Peppers
P2.19	Arian Frost	Colorado College	Thermodynamic Examination of Leadzyme
P2.20	Nicholas Orlofsky	Washington University in St. Louis	The sources of ultra-high energy cosmic rays

P2.21	Sarice Barkley	St. Olaf College	Rigorous Calibration of Atomic Force Microscope Colloidal Probes
P2.22	Kenji Yoshino	Grinnell College	Synthesis and Characterization of Molybdenum (VI) Imido Complexes with N-salicylidene-2-aminophenol
P2.23	Arcelia Ortega	Hope College	