Welcome to the 6th Annual Undergraduate Research Spring Symposium & Awards

Tuesday, April 5th, 2011

Time: 1:00 - 6:00 pm

Location: Student Center Ballroom and Surrounding Rooms
6th Annual Undergraduate Research Spring Symposium

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Schedule of Events

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Session A: International Affairs, Economy and Industry  
Student Center Room 301  
Moderator: Ms. Jennifer Kimble, Office of Pre-Health Advising

1:00 Designing for Music Consumption in an Internet Age  
Bethany Sumner, CS  
Mentor: Dr. Rebecca Grinter, CS

1:20 WMD Terrorism in the Middle East  
Lucia Bird, INTA  
Mentor: Dr. Margaret E. Kosal, INTA

1:40 WMD in Gaming  
Jared Fry, INTA  
Mentor: Dr. Margaret E. Kosal, INTA

2:00 Have the Diversification Benefits of International Investing Declined Due to Global and Regional Macroeconomic Integration?  
Stephen Brincks, Econ  
Mentor: Dr. Christine Ries, Econ

Session B: People, Society and Culture  
Student Center Room 301  
Moderator: Ms. Jennifer Kimble, Office of Pre-Health Advising

2:40 Dynamic Families: Media Representations and Lesbian Motherhood  
Nicole Turner, STC  
Mentor: Dr. Anne Pollock, STC

3:00 Navajo Wind  
Della Hall, HTS  
Mentor: Dr. Douglas Flamming, HTS

3:20 Determining the Implications of Resegregation in the Atlanta Public School System and its Affect on Student Achievement  
Denise Bringslid, HTS  
Mentor: Dr. Ronald Bayor, HTS
Session C: Neuroscience and Osteology  
Student Center Room 319  
Moderator: Ms. Sandi Bramblett, IRP

1:00  The Effect of Oxygen Tension on Vitamin D3 Signaling in Growth Plate Chondrocytes  
Kelsie Riemenschneider, BME  
Mentor: Dr. Barbara Boyan, BME

1:20  Mapping Anatomical Connectivity of the Cerebral Cortex and Its Applications in Evolution of Aging in Primates  
Frederick Damen, BME  
Mentor: Dr. David Hu, BME

1:40  The Neural Correlates of Within Category Competition for Visual Representation  
Andy Chung, Psychology  
Mentor: Dr. Paul Corballis, Psychology

Session D: Robotics and Biomedical Engineering  
Student Center Room 319  
Moderator: Mr. Rob Rogers, DOPP

2:40  Passive In-Situ Sample Protection Systems  
Richard Zappulla, AE  
Kevin Reilley, AE  
Ryan Cornell, AE  
Mentor: Dr. Narayanan Komerath, AE

3:00  Bio-Inspired Robot Arm  
Trey Davenport, ME  
Mentor: Dr. Jun Ueda, ME

3:20  Determination of Glutathionylation of IKK in Different Oxidative Stress Conditions  
Debika Mitra, BME  
Mentor: Dr. Melissa Kemp, BME
Session E: Energy Efficiency and Quantum Mechanics
Student Center Room 320
Moderator: Dr. Caroline Noyes, Office of Assessment

1:00  Space Power Grid
Brendan Dessanti, AE
Nicholas Picon, AE
Chris Gilbert, AE
Shaan Shah, AE
Mentor: Dr. Narayanan Komarath, AE

1:20  Carbon Dioxide Capture from Cole– Fired Power Plants Using Reservible Ionic Liquids
Sean Faltermeier, ChemE
Mentor: Dr. Charles Eckert, ChemE

1:40  Effect of C-PAM on the Thermal Processing Behavior of Cornstarch
Alison Krantz, ChemE
Mentor: Dr. Sujit Banerjee, ChemE

2:00  Long-lived Interacting Neutral Atom Quantum Memories
Anastasia Marchenko, Physics
Mentor: Dr. Alex Kuzmich, Physics

Session F: Oncology Research and Biomedical and Mechanical Engineering
Student Center Room 320
Moderator: Dr. Caroline Noyes, Office of Assessment

2:40  Multiplex Cathepsin Zymography Captures Stage-specific Activity Profiles of Cathepsins K, L, and S in Human Breast, Lung, and Cervical Tumors
Binbin Chen, BME
Mentor: Dr. Manu O Platt, BME

3:20  Mechanical Diagnostics of Ovarian Cancer
Byung Kyu Kim, BME
Mentor: Dr. Todd Sulchek, ME
Session G: Mechanical and Chemical Engineering
Student Center Room 321
Moderator: Dr. Tris Utschig, CETL

1:00 Nonionic Surfactants for Charge Control in Nonpolar Liquids
Crystal Clemmons, ChemE
Mentor: Dr. Sven Behrens, ChemE

1:20 Thermoelectric Coolers for Hotspot Thermal Management of Stacked 3D Stacked Chips
Redmond Matthew, ME
Mentor: Dr. Satish Kumar, ME

1:40 Mechanical and Electrical Properties of BaTiO_3 and Carbon Epoxy Composites
Gloria Wu, ME
Mentor: Dr. Kyriaki Kalaitzidou, ME

Session H: Aerospace Engineering: Combustion and Propulsion
Student Center Room 321
Moderator: Dr. Paul Hurst, Fellowship Communication Program

2:20 Numerical and Experimental Studies of Flame Stability in a Cavity Stabilized Hydrocarbon-Fueled Scramjet
Jagannath Pranatharthikaran, AE
Chaitanya Ghodke, ME
Ghislain Retazureau, AE
Mentors: Dr. Suresh Menon, AE

2:40 Effects of Flame Temperature Ratio on Bluff Body Wakes
Julia Lundrigan, AE
Mentor: Dr. Tim Lieuwen, AE

3:00 Combustion Instability Mitigation through Dissipation of Acoustic Energy Using Perforated Plates
Charles Lu, ME
Mentor: Dr. Tim Lieuwen, AE

3:20 Utilization of Lunar Resources for Human Mars Missions
Chase Brown, AE
Mentor: Dr. Alan Wilhite, AE
Session I: Biomedical Engineering and the Cardio Vascular System  
Student Center Room 343  
Moderator: Ms. Lori Critz, Library

1:20  Anatomical Analysis of Optiflo Geometries  
Kalpi Desai, BME  
Mentor: Dr. Ajit Yoganathan, BME

1:40  Measurement of Strut Chordal Forces of the Tricuspid Valve using Miniature C Rings  
Lauren Troxler, BME  
Mentor: Dr. Ajit Yoganathan, BME

Session J: Biomedical Engineering and Biochemistry in the Life Sciences  
Student Center Room 343  
Moderator: Mr. Jarett Lafleur, SSDL

2:20  Temporal Changes in Gene Expression Regulating Mouse Posterior Frontal Suture Fusion  
Regina Chang, BME  
Mentor: Dr. Barbara D. Boyan, BME

2:40  Biological Response of Lymphatic Endothelial Cells to Mechanical Loads  
Arina Korneva, BME  
Mentor: Dr. Brandon J. Dixon, ME

3:00  Application of SYPRO® Orange, a Fluorescent Hydrophobic Dye, for a High-Throughput Ligand Binding Assay for Proteins of Unknown Structure and/or Function  
Pamela Chi, Biochemistry  
Mentor: Dr. Raquel Lieberman, Biochemistry

3:20  Hfq as a Destabilizer for DsrA Hairpin Stems: Permutations of Short sRNA Segments for RNA-RNA Interaction Study  
Kanav Jain, BME  
Mentor: Dr. Roger Wartell, Biology

3:40  Engineering the Microenvironment of Embryoid Bodies via Heparin-Modified Gelatin Microparticle Incorporation  
Katy Hammersmith, BME  
Mentor: Dr. Todd McDevitt, BME
1 Vertical-Axis Wind Turbine (VAWT)
Ryan McGowan, AE
Akshay Pendharkar, AE
Alexander Forbes, AE
Julian Forero, AE
Sorin Pirau, AE
Cristian Salguiero, AE
Raymond Chan, IsyE
Mentor: Dr. Narayanan Komerath, AE

2 Analysis on Flow Circumferential Uniformity with Bellmouth Inlet
Chun Kit Chung, AE
Mentor: Dr. Yuan Liu, AE

3 Computation-Experiment Interface to Understand Complex Aerodynamic Systems
Christopher Duffy, AE
David Miculescu, AE
Mentor: Dr. Narayanan Komerath, AE

4 A New Look at Hydrogen Powered Supersonic Airliners
Alex Forbes, AE
Mentor: Dr. Narayanan Komerath, AE

5 Collection Efficiency of a Helicopter Rotor Using an Eulerian Approach – Validation
Dennis Garza, AE
Mentor: Dr. Lakshmi Sankar, AE

6 Shell Furnace Testing
Sean Hwang, AE
Mike MacMillan, AE
Ross Cooper, AE
Nico Stockwell, AE
George H. Bergmark, AE
Mentor: Dr. Tim Lieuwen, AE

7 A Transfer Function Approach to Analyzing Flame Response to Transverse Acoustic Excitation for Gas Turbine Applications
Jared Mannino, AE
Colin Vanatta, AE
Mentor: Dr. Tim Lieuwen
9 Chemical Analysis of Exhaust For After-Injection Combustion Chamber in Response to Quench Section Passthrough
Timothy Nevius, AE
Mentor: Dr. Tim Lieuwen, AE

10 Energy Harvesting Using a Rocking Chair
William Peirsol, AE
Mentor: Dr. Massimo Ruzzene, AE

11 Plasma Enhanced Chemical Vapor Deposition (PECVD) of Limonene
Kevin Reilley, AE
Mentors: Dr. K.K Ahuja, AE

12 Testing the Effects of Harmful Algal Blooms, Karenia Brevis and Alexandrium Fundyense on the Escape Behavior of the Calanoid Copepod, Temora longicornis
Aakanksha Angra, Applied Biology
Mentor: Dr. Jeannette Yen, Applied Biology

13 Characterization of Quorum Sensing and Natural Competence in Environmental Isolates of Vibrio cholerae
Eryn Bernardy, Applied Biology
Mentor: Dr. Brian Hammer, Applied Biology

14 Translational Limitations and Features of Human Uricase
Christina Graves, Applied Biology
Mentor: Dr. Eric Gaucher, Applied Biology

15 Inducing a Thermogenic Response to Cold Shock in E. coli
Christina Graves, Applied Biology
Mitesh Agrawal, BME
Margo Clark, Biology
Scott Holmes, BME
Christian Mandrycky, BME
Mentors: Dr. Eric Gaucher, Applied Biology
Dr. Josh Weitz, Applied Biology

16 Krill Schooling as a Function of Time
Marlene Kanagawa, Applied Biology
Mentor: Dr. Jeannette Yen, Applied Biology
17 Investigating the Correlation Between rs3814113 and Ovarian Cancer
James Small, Applied Biology
Mentor: Dr. John McDonald, Applied Biology

18 Insights into the Pathway of RNA-Templated DNA Repair and RNA-Driven DNA Modification
Matthew Taylor, Applied Biology
Mentor: Dr. Francesca Storici, Applied Biology

19 Investigation of the Role of H19 Gene Expression in Ovarian Carcinoma
Nikita Wright, Applied Biology
Mentor: Dr. Yuhong Fan, Applied Biology

20 Application of Physarum Polycephalum as an Urban Design Tool
David Zhu, Applied Biology
Debayan Bhaumik, BME
Michael Delvin, Applied Biology
Azam Siddiqui, Applied Biology
Mentor: Dr. Jeannette Yen, Applied Biology

21 Frontal Plane Kinematics and Kinetics of the Center of Mass of the Cat During Walking Along Paths of Different Widths
Juan Cave, BME
Mentor: Dr. Boris Prilutsky, Applied Physiology

22 Macrophage inflammatory activation and inhibition
Thejas Hiremath, BME
Mentor: Dr. Sheldon May, Biochemistry

23 Molecular beacon based selection of cells expressing a targeted gene correction
Benjamin Scott, BME
Mentor: Dr. Brian Wile, BME

24 The Development of a Novel Anticoagulant Using PEGylated Fibrin ‘A’ Knob Peptides
Nader Aboujamous, BME
Mentor: Dr. Thomas H. Barker, BME

25 Tactile Detection and Biomechanics
Bilal Bari, BME
Mentor: Dr. Garrett Stanley, BME
26 Fluid Mechanical Analysis in Surgically Reconstructed Aortas
Laura Bracaglia, BME
Mentor: Dr. Ajit Yoganathan, BME

27 Effects of Cyclic Stretch and Pressure on Aortic Valve Calcification
Harika Gorti, BME
Mentor: Dr. Ajit Yoganathan, BME

28 Hemodynamic Assessment of Bicuspid Aortic Valves as a Clinical Diagnostic Tool
Shabnam Gupta, BME
Mentor: Dr. Ajit Yoganathan, BME

29 Effects of Senescence on Signaling Dynamics and Redox Status of Cultured Primary T Cells
Abby Hill, BME
Mentor: Dr. Melissa Kemp, BME

30 Comparison of Parameter Estimation Algorithms for Metabolic Pathway Models
Eric Huang, BME
Mentor: Dr. May Wang, BME

31 Effects of Nitric Oxide Synthase and Reactive Oxygen Species in Cardiac Heart Valves
Samiya Hussain, Chemistry
Mentor: Dr. Ajit Yoganathan, BME

32 Study of Hemodynamic Differences Between flow through Rigid and Flexible Aortic Sections
Nicole Milligan, BME
Mentor: Dr. Ajit Yoganathan, BME

33 Low and Unsteady Shear Stresses Upregulate Calcification Response of the Aortic Valve Leaflets
Elizabeth Morris, BME
Mentor: Dr. Ajit P. Yoganathan

34 Comparing Quantitative Models of Microtubule Dynamics for Cancer Drug Treatment
Sina Mostaghimi, BME
Mentor: Dr. May Dongmei Wang, BME

35 Cellular Responses in Neural Degeneration: In vitro Analysis of Potential Neuronal Receptors for Chondroitin Sulfate Proteoglycans
Patricia Murphy, Applied Biology
Mentor: Dr. Lohitash Karumbaiah, BME
36 The Application of Long Term, Low Levels of Reactive Oxygen Species (ROS) to HeLa Cells: a Model of Chronic ROS
Willa Ni, BME
Mentor: Dr. Melissa Kemp, BME

37 Disruption of Pdia3, a Mediator of Rapid Membrane Responses to 1α,25-Dihydroxyvitamin D3 Results in Embryonic Lethality in Homozygotes and Bone Abnormality in Heterozygotes
Alexandr Nizkorodov, BME
Mentor: Dr. Barbara Boyan, BME

38 A Reliable Interface for Bi-Directional Information Exchange with the Peripheral Nervous System
James Schwoebel, BME
Anish Joseph, BME
Mentor: Dr. Ravi Bellamkonda

39 Effect of Electrospun Titania Meshes on Osteoblast Growth and Differentiation
Rosemary Song, BME
Mentor: Dr. Barbara Boyan, BME

40 Curing of Aqueous Base-Developable Photosensitive Polynorbornene Dielectric by Variable Frequency Microwave Processing
Christina Bins, ChemE
Chris Hilgert, ChemE
Layla Marshall, EE
Jeremy Thompson, CompE
Mentor: Dr. Paul Kohl, ChemE

41 The Temperature Controlled Modulation of Group IV Nanowires
Jiawei Luo, ChemE
Mentor: Dr. Michael A. Filler, ChemE

42 Biomaterial Degradation of Alginate-Based Encapsulation Systems
Chun Yong, BME
Mentor: Dr. Athanassios Sambanis, BME

43 Synthesis of Triple-Layered Stacked Oligo(Phenylene Ethynylene)s to Explore Charge Migration in Organic Semiconductors
Alma Castaneda, Chemistry
Mentor: Dr. David Collard, Chemistry

44 Structural Probing of DNA Triplet Repeats
Michael Chen, Chemistry
Mentor: Dr. Nicholas Hud, Chemistry
45 High Contrast Fluorescent Probes
Mysha Sarwar, Chemistry
Mentor: Dr. Christoph Fahrni, Chemistry

46 Enzymatic Degradation of Low Density Lipoproteins
Jairo Zapata, Biochemistry
Mentor: Dr. Christine K. Payne, Chemistry

47 New Random Graphs Models and Algorithms
Antonia Blanca-Pimentel, CS
Mentor: Dr. Milena Mihail, CS

48 Sum-set Bounds on Graphs
Michelle Delcourt, Discreet Math
Mentor: Dr. Xingxing Yu, Discreet Math

49 Modeling Energetic-Charged Particles in the Europa-Jupiter Environment
Derek Podowitz, EAS
Mentor: Dr. Carol Paty, EAS

50 Timing and Extent of Late Quaternary Glaciations near Lake Khovsgol, Mongolia: Implications for Climate Change in Central Asia
Afshan Shaikh, EAS
Mentor: Dr. Kurt Frankel, EAS

51 Stream Terraces in the Critical Zone - Lower Gordon Gulch, Colorado
Kathleen Warrell, EAS
Mentor: Dr. Kurt Frankel, EAS

52 Eliminating Bottlenecks in Clinic Redesign
Tiffany Adams, IE
Mentor: Dr. David Cowan, IE

53 Decisions by Data: How Does an Organization Use Data for Planning, Management, and Decisions?
Melissa Nesbitt, IE
Mentor: Dr. David Cowan, IE

54 Analysis of Diabetic Retinopathy Screening Methods
Jennifer Sisson, IE
Mentors: Dr. Nicoleta Serban, IE
Dr. Julie Swann, IE

55 US and GT Involvement in FP7
Gemma Buckler, International Affairs
Katie Murphy, International Affairs
Mentor: Dr. Vicki Birchfield, International Affairs
56 Security and Gaming
Sapphire Liu, INTA
Mentor: Dr. Margaret E. Kosal, INTA

57 Comparison of the Electrical Properties of PS-PMMA-MWNT Composites Made by Three Different Fabrication Methods
Samual Wilson, ChemE
Mentor: Dr. Rosario Gerhardt, MSE

58 Designing Microscale Self-Propelling Swimmers
Benjamin Bingham, ME
Mentor: Dr. Alexander Alexeev, ME

59 Minimization of Atomic Force Microscope Thermal Drift via Quality Factor Feedback
Lin Fan, ME
Mentor: Dr. Todd Sulchek, ME

60 In-plane chip-to-chip microfluidic interconnects
Venkat Goli, ChemE
Mentor: Dr. Todd Sulchek, ME

61 Expression and Conjugation of Internalin A Ligand onto Microparticles for Internalization Kinetics Studies on Non-phagocytotic Cells
Natalie Haddad, Applied Biology
Mentor: Dr. Todd Sulchek, ME

62 Investigation of Mechanical Properties of Metastatic Cells
Caitlin Henegar, ME
Mentor: Dr. Todd Sulchek, ME

63 Three Dimensional Particle Tracking Using Two Dimensional Images
Karan Patel
Mentor: Dr. Todd Sulchek

64 Vibrofluidized Melting of Geometrically Cohesive Granular Media
Geoff Russell, ME
Mentor: Dr. David Hu, ME

65 Lift Modulation in a Sand-Swimming Robot
Andrew Masse, Physics
Mentor: Dr. Daniel Goldman, Physics

66 Task Challenges Experienced by Home Health Care Providers
Sarah Johnston, Psychology
Mentor: Dr. Wendy Rogers, Psychology
67  **VPedal to the Metal: What Factors Determine Driver Braking?**  
Alison Williams, Psychology  
Mentor: Dr. Gregory M Corso, Psychology

68  **The Effect of Open Source Software on the Economic Freedom of Countries**  
Ian Yamamoto, Public Policy  
Mentor: Dr. Doug Noonan, Public Policy

69  **Girls Excelling in Math and Science (GEMS)**  
Kristin Seiloff, Management  
Mentor: Dr. Carol Colatrella, STC

70  **Characterization of Fluid Shear Stress on the Normal Aortic Valve Leaflet**  
Gowthami Tamilselvan, ChemE  
Mentor: Dr. Ajit Yoganathan, BME
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