

# Undergraduate Research Spring Symposium & Awards



# Thursday April 3rd, 2008

Sponsored by:  
Undergraduate Research  
Opportunities Program (UROP)

## **Event:**

Thursday April 3, 2008

## **Location:**

Student Center Ballroom & Surrounding Rooms

## **Times:**

Oral Presentations 1:40-4:20 pm

Poster Session 3:00-4:30 pm

Awards Ceremony & Reception 4:30-6:00 pm

# **Oral Presentations**

## **Student Center, 3rd Floor**

**Session A: Computing**  
**Student Center Room 301**

**Moderator: Mr. Mitch Keller, Mathematics/Computing**

**2:20pm**

**An Improvement to the Regula Falsi Method**

Rob Parrish, ME

**2:40pm**

**The Online Community Grid**

Danny Miller, CM

Mentor: David Bader, COC

**3:00pm**

**MANET routing: Manifolds and the WDL**

James Robinson, CS

Mentor: Santosh Vempala, COC

## Session A, continued

3:20pm

### **Imprint**

Hafez Rouzati, CS

Mentor: John Stasko, COC

## **Session B: Biomedical, Chemical, and Materials Engineering Student Center Room 321 Moderator: Ms. Ann Blasick, DOPP**

1:40pm

### **Platinum Catalyst Degradation in Proton-Exchange Membrane Fuel Cells**

Yungchi Fan, CHBE

Mentor: Tom Fuller, GTRI

2:00pm

### **Quantitative Metrics for Bio-Modeling Algorithm Selection**

Chanchala Kaddi, BME

Mentor: May Wang, BME

2:20pm

### **Nanoscale Imaging Probes for Personalized Medicine**

Leslie Chan, BME

Sri Rahul Balusu, BME

Alice Chan, BME

Mentors: Ravi Bellamkonda, BME; Stathis Karathanasis, BME

2:40pm

### **Bioinspired Design of Hydrogel-Encapsulated Underwater Flow Sensors**

David Lu, MSE

Mentors: Vladimir Tsukruk, MSE; Michael E. McConney, MSE;

Kyle Anderson, MSE

3:00pm

### **Optimizing the Synthesis of PK3 for Drug Encapsulating Microparticles**

Sydney Shaffer, ChBE

Mentor: Niren Murthy, BME

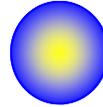
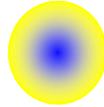
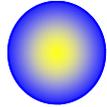
## Session B, continued

3:20pm

### **Poly(ethylene)glycol-based Poly(beta-amino ester) for Stem Cell Encapsulation**

Martha Lesniewski, MSE

Mentor: Ken Gall, MSE



## **Session C: Aerospace, Mechanical, and Electrical Engineering Student Center Room 319 Moderator: Dr. Tris Utschig, CETL**

2:00pm

### **Development of a Small Size RoboCup Team**

Andrew Bardagjy, ECE

Roman Shytman, CS

Stefan Posey, AE

Jason Kulpe, ME

Phillip Marks, EE

Ben Johnson, EE

2:20pm

### **A Novel Architecture for Broadband Optical Access Network**

George Melcer, CmPE

Mentor: G.K. Chang

2:40pm

### **Parachute Recovery System Design for the Mars Gravity Biosatellite Entry, Decent, and Landing System**

Brandon Smith, AE

Mentor: Robert Braun, AE

## Session C, continued

3:00pm

### **Dynamics of an Acoustically Excited Swirl Flame**

Hsin-Hsiao Ma, AE

Mentor: Tim Lieuwen, AE; Kumar Thumuluru, AE

3:20pm

### **Power Transmission through Fluid Coupling**

Laura Hershberger, AE

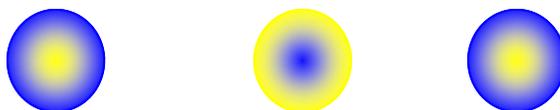
Mentor: Narayanan Komerath, AE

3:40pm

### **Comparison of RBF and SHL Neural Network Based Adaptive Control Applied to Low and High Fidelity Flight Simulations**

Ryan Anderson, AE

Mentor: Eric Johnson, AE



## Session D: Sciences

Student Center Room 320

**Moderator: Dr. Karen Adams, Fellowship  
Communication Program**

2:00pm

### **Visualizing Transcytosis via a FRET-based Low-Density Lipoprotein Probe**

Nicole Fay, Chemistry

Mentor: Christine Payne, Chemistry

2:20pm

### **Ratiometric Zn(II)-Sensing with 2-(2-Arylsulfonamidophenyl)benzimidazole Derivatives: Decoupling the Zn(II)-induced Emission Shift from pH-dependent Changes**

Aneese Chaudry, Chemistry

Mentor: Christoph Fahrni, Chemistry

## Session D, continued

2:40pm

### **Maximum G-Parking Functions**

Brian Benson, Math

Mentor: Prasad Tetali, Math

3:00pm

### **Fin Ray Modeling**

Alan Penkar, Math

Azhar Bande-Ali, CmPE

Mentor: Silas Alben, Math

3:20pm

### **The Effects of Immediate Experience with a Novel Technology on Privacy Concerns**

Kaylee Burnham, Psychology

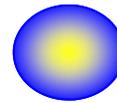
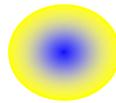
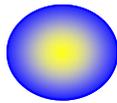
Mentor: Wendy Rogers, Psychology; Dan Fisk, Psychology

3:40pm

### **Degradation of Information: Warning Symbol Design Considering Damage**

Daniel Shorr, Psychology

Mentor: Arthur D. Fisk, Psychology



## **Session E: Humanities Student Center Room 301 Moderator: Dr. Karen Head, CETL/LCC**

4:00pm

### **Assistive Technology: The Application and Rhetoric of Cochlear Implants**

Lindsay Chatel, STAC

Mentor: Rebecca Burnett, LCC

# Poster Presentations

## Student Center Ballroom

### Ivan Allen College of Liberal Arts

- 1 University Education Expansion in Venezuela and Labor Market Outcomes: What Can We Learn from the Data**  
Naihobe Gonzalez, EIA  
Mentor: Ruth Uwaifo, ECON
- 2 A History of Birth Control**  
Jonathan Hege, HTS  
Mentor: John Tone, HTS
- 3 Gene Doping in Sports**  
Dustin Padgett, ME  
Mentor: John Tone, HTS
- 4 Eugenics in Georgia: The Changing Influence of Lawmakers, Advocates, and the Public, 1937-1970**  
Leyna Palmer, HTS  
Mentor: Amy D'Unger, HTS
- 5 Malaria and Social Change in the Southeast**  
Malcolm Palmer, HTS  
Mentor: John Tone, HTS
- 6 Which Witch? The Controversy Surrounding Bewitched and Harry Potter**  
Natalie Warnick, HTS  
Mentor: Doug Flamming, HTS
- 7 A History of Pediatric Leukemia Treatment**  
Naomi Warnick, Biology  
Mentor: John Tone, HTS

# Ivan Allen College of Liberal Arts, continued

## 8 **Second Life Augmented Reality—Virtual Performance Project**

Jenifer Vandagriff, STAC

Tobias Lang, Visiting Student

Florian Schulz, Visiting Student

Brian Shrader, CM

Jarryd McCree, CM

Malinda Drinkuth, CM

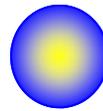
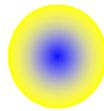
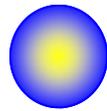
Mentors: Michael Nitsche, LCC; Jay Bolter, LCC;

Kathryn Farley, LCC; Blair McIntyre, COC

## 9 **Georgia's Gold Industry After the Civil War**

Stephen Brinks, HTS

Mentor: Douglas Flamming, HTS



## College of Sciences

## 10 **The Effects of Pacing in Teaching Older Adults to Use Novel Technologies**

Tatyana Kabakova, Psychology

Mentor: Wendy Rogers, Psychology

## 11 **The Effects of Worked Example Ordering on Learning and Retention**

Roudabeh Kishi, Psychology

Mentor: Richard Catrambone, Psychology

## 12 **Bile Acids Modulate Steroidogenic Gene Expression in H295R Adrenocortical Cells**

Shaili Shah, BIOL

Mentor: Marion Sewer, BIOL

## College of Sciences, continued

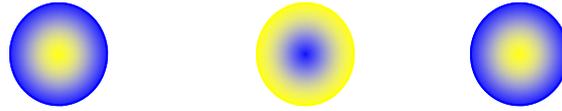
- 13 Rotifer Ecotoxicology: Behavioral Avoidance of Toxicants**  
Emily Weigel, BIOL  
Mentor: Terry Snell, BIOL
- 14 [PSI+] Prion Transmission Within the Yeast Saccharomyces Genera**  
Stefka Gyoneva, BIOL  
Mentors: Yury O. Chernoff, BIOL; Buxin Chen, BIOL
- 15 Use of Introduced Enantioselectivity into Thin PANI Films for Gas Sensing: Scopes and Limitations**  
David Lovett, ChBE  
Mentor: Mirosława Josowicz, Chemistry
- 16 Zinc Activity Determination of 4-(2-pyridylidene)-1, 2-dimethyl-1H-imidazol-5(4H)-one**  
Charles Song, Chemistry  
Mentor: Kril Solnstev, Chemistry
- 17 Abrupt Circulation Alterations before the Last Glacial Maximum**  
Leonard Henry, EAS  
Mentor: Jean Lynch-Stieglitz, EAS
- 18 A Cascade of Length Scales in Elastic Rings under Confinement**  
Kevin Spears, Math  
Mentor: Silas Alben, Math
- 19 Compact, Efficient IEC Fusion Reactor**  
Andrew Seltzman, Physics  
Mentor: Chandra Raman, Physics

## College of Sciences, continued

**20 The Application of Simplification and Clifford Algebras to Modern Physical Theories**

Sarang Shah, Physics

Mentor: David Ritz Finkelstein, Physics



## College of Engineering

**21 Technology Projection for Micro Renewable Energy Systems**

Jason Bice, AE

Mentor: Narayanan Komerath, AE

**22 1KW Solar Generator for the Global Market**

Abhizna Butchibabu, AE

Mentor: Narayanan Komerath, AE

**23 Micro Renewable Energy Generation: A Study of Stirling Engines**

Christopher Lamberti, AE

Mentor: Narayanan Komerath, AE

**24 Yard Waste to Methane**

Matthew Layfield, AE

Mentor: Narayanan Komerath, AE

**25 Modeling and Development of a Self-Starting Vertical-Axis Wind Turbine**

Ranjit Mantri, AE

Ankit Tiwari, AE

Mentor: Narayanan Komerath, AE

**26 Reduction of Particulate Emissions from Biomass Incineration**

James Mesiona, AE

Mentor: Narayanan Komerath, AE

## College of Engineering, continued

- 27 An Interaction Alignment Tool for Rotocraft Flowfield Measurements**  
Thomas Pappas, AE  
Mentor: Narayanan Komerath, AE
- 28 High Intensity Solar Cell Integration in Terrestrial Systems**  
Kamalakannan Radharamanan, BME  
Vigneshshwar Venkat, AE  
Mentor: Narayanan Komerath, AE
- 29 Emission Spectroscopy of a Helicon Plasma**  
Lisa Stuber, AE  
Mentor: Mitchell Walker, AE
- 30 Potential for Combining Biomass Energy Extraction with Other Concepts for Distributed Power Generation**  
Vigneshshwar Venkat, AE  
Mentor: Narayanan Komerath, AE
- 31 Finding Biological Signals in Inhomogeneous Sequences by a Gibbs Sampler Algorithm**  
Marc Bruce, Chem  
Mentor: Mark Borodovsky, BME
- 32 Quantifying Glutathionylation in Jurkat T Cells**  
Theodore Chen, BME  
Mentor: Melissa Kemp, BME
- 33 Diagnosing Left Ventricular Dyssynchrony with Analysis of Heart Wall Thickening from Cardiac CT**  
Matthew Goette, BME  
Mentor: John Oshinski, BME

## College of Engineering, continued

- 34 Modeling and Assessment of Congenital Bicuspid Aortic Valve Fluid Dynamics**  
Ramya Parthasarathy, BME  
Roy Rusly, BME  
Mentor: Ajit Yoganathan, BME
- 35 Development of a Biochemical Assay to Quantify PKC $\theta$**   
Karen Shih, BME  
Mentor: Melissa Kemp, BME
- 36 Toxicity Review of Bio-Conjugated Quantum Dots for Cancer Treatment**  
Clarisse Tallah, BME  
Mentors: May Wang, BME; Change Quo, BME
- 37 Effects of Stem-cell Derived Biomaterial on Cell Migration**  
James Waring, BME  
Mentor: Todd McDevitt, BME
- 38 Mechanical Testing of Collagen-Based Blood Vessel Substitutes**  
Christa Caesar, BME  
Alison Skala, ME  
Yue Geng, Chemistry  
Mentor: Rudy Gleason, ME
- 39 Real-time Pro-Active Work Zone Safety**  
Clare Fullerton, CEE  
Matthew Winkler, CEE  
Mentor: Jochen Teizer, CEE
- 40 Plasticity Indexes of Varying Clay Mixtures**  
Savannah Gowdy, CEE  
Mentor: Laura Spencer, CEE; Glenn Rix, CEE
- 41 Development of a Microbial Fuel Cell**  
Jina Kang, ChBE  
Mentor: Thomas Fuller, ChBE

## College of Engineering, continued

- 42 Controlling Emulsion Stability with Colloidal Particles**  
Adam Azaibi, ChBE  
Mentor: Sven Behrens, ChBE
- 43 Effects of Composite on the Mechanism of Formulation of Single-Walled Mixed-Oxide Nanotubes: A Dynamic Light Scattering Study**  
Cintia Nojima, ChBE  
Mentor: Sankar Nair, ChBE
- 44 Ring-Opening a Pathway To a Renewable, Chemically Customizable Plastic**  
Michael Nolan, ChBE  
Mentor: Christopher Jones, ChBE
- 45 Adsorption of Water on Single-Walled Aluminosilicate Nanotubes**  
Ho Ming Tong, ChBE  
Mentor: Sankar Nair, ChBE
- 46 Neuronal Growth on Carbon Nanotubes**  
Kirsten Kepple, BME  
Rodolfo Camacho-Aguilera, MSE  
Mentors: Jud Ready, GTRI; Vivek Mukhatyar, GTRI; Jack Flicker, GTRI
- 47 Vertically Aligned Carbon Nanotube Arrays as Field Emission Sources in Hall Effect Thrusters**  
Victor Kumsomboone, MSE  
Mentor: Jud Ready, GTRI
- 48 Growth of Multiwalled Carbon Nanotubes on Carbon Fabric**  
Philippe Lacasse, ChBE  
Mentor: Jud Ready, GTRI

## College of Engineering, continued

- 49 Modeling and Simulation of the Impact Response of Filled and Unfilled Linear Cellular Alloys for Structural Energetic Material Applications**  
Adam Jakus, MSE  
Mentor: Naresh Thadhani, MSE
- 50 Fabrication of Colloidal Crystal Rings**  
Victor Kumsomboone, MSE  
Mentor: Valeria Milam, MSE
- 51 Effects of Mutations on DNA as a Biomaterials Assembly Tool**  
Sonya Parpart, BME  
Mentor: Valeria Milam, MSE
- 52 Closed Gas Cycle Boundary Layer Turbine For Micro Renewable Power**  
Dustin Teuscher, AE  
Pierre Valdez, AE  
Mentor: Naresh Thadhani, MSE
- 53 Non-Destructive Evaluation of Precipitation-Hardened Superalloy Microstructures**  
Ricky Wheelchel, MSE  
Mentors: Rosario Gerhardt, MSE; G. Siva Kumar Kelekanjeri, MSE
- 54 Multi-agent Object detection and Localization**  
Melissa Watkins, ECE  
Nicole Rennalls, EE  
Mentor: Ayana Howard, ECE
- 55 The Effect of Robust Input Shapers on Bridge Crane Operator Performance**  
Jeffery Clement, ME  
Mentor: Bill Singhose, ME
- 56 Effects of Input Shaping Delay on Operator Performance**  
Aayush Daftari, ME  
Mentor: Bill Singhose, ME

# College of Engineering, continued

- 57 Fretting In AISI Stainless Steel**  
Matthew Fallacara, ME  
Mentor: Richard W. Neu, ME
- 58 Low-Overshoot Command Shaping for Decelerating Flexible Machines**  
Jason Kulpe, ME  
Mentor: Bill Singhose, ME
- 59 Experimental Study of Input-Shaping in Mobile Tower Cranes**  
Adrit Lath, ME  
Mentor: Bill Singhose, ME

# PUIRA

President's Undergraduate Research Award



**Fall 2008 Applications due May 19th**

Apply for competitive \$1500 salary awards or  
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One-on-one work with a faculty mentor

Opportunities to discover new methods and techniques

Visit <http://www.undergradresearch.gatech.edu/funding.php> for more  
information and application instructions.

# Oral Presentations

## Student Center, 3rd Floor

Session A: Computing Room 301	Page
2:20 Rob Parrish	2
2:40 Danny Miller	2
3:00 James Robinson	2
3:20 Hafez Rouzati	3
Session B: Biomedical, Chemical, and Materials Engineering. Room 321	Page
1:40 Yungchi Fan	3
2:00 Chanchala Kaddi	3
2:20 Leslie Chan & Team	3
2:40 David Lu	3
3:00 Sydney Shaffer	3
3:20 Martha Lesniewski	4
Session C: Aerospace, Mechanical, and Electrical Engineering Room 319	Page
2:00 Andy Bardagjy & Team	4
2:20 George Melcer	4
2:40 Brandon Smith	4
3:00 Hsin-Hsiao Ma	5
3:20 Laura Hershberger	5
3:40 Ryan Anderson	5
Session D: Sciences Room 320	Page
2:00 Nicole Fay	5
2:20 Aneese Chaudry	5
2:40 Brian Benson	6
3:00 Alan Penkar	6
3:20 Kaylee Burnham	6
3:40 Daniel Shorr	6
Session E: Humanities Room 301	Page
4:00 Lindsay Chatel	6

# Poster Presentations

## Student Center Ballroom

### Ivan Allen College of Liberal Arts

	Poster Number	Page
Stephen Brincks	9	8
Naihobe Gonzalez	1	7
Jonathan Hege	2	7
Dustin Padgett	3	7
Leyna Palmer	4	7
Malcolm Palmer	5	7
Natalie Turbiville	6	7
Jennifer Vandagriff & Team	8	8
Naomi Warnick	7	7

### College of Science

	Poster Number	Page
Stefka Gyoneva	14	9
Leonard Henry	17	9
Tatyana Kabakova	10	8
Roudabeh Kishi	11	8
David Lovett	15	9
Andrew Seltzman	19	9
Sarang Shah	20	10
Shili Shah	12	8
Charles Song	16	9
Kevin Spears	18	9
Emily Weigel	13	9

### College of Engineering

	Poster Number	Page
Adam Azaibi	42	13
Jason Bice	21	10
Marc Bruce	31	11
Abhizna Butchibabu	22	10
Christa Caesar	38	12
Theodore Chen	32	11

## College of Engineering Continued

## Poster Number

## Page

Jeffery Clement	55	14
Aayush Daftari	56	14
Matthew Fallacara	57	15
Clare Fullerton	39	12
Matthew Goette	33	11
Savannah Gowdy	40	12
Adam Jakus	49	14
Jina Kang	41	12
Kirsten Kepple	46	13
Victor Kumsomboone	47, 50	13, 14
Jason Kupke	58	15
Philippe Lacasse	48	13
Christopher Lamberti	23	10
Adrit Lath	59	15
Ranjit Mantri	25	10
Matthew Mayfield	24	10
James Mesion	26	10
Cintia Nojima	43	13
Michael Nolan	44	13
Thomas Pappas	27	11
Sonya Parpart	51	14
Ramya Parthasarathy	34	12
Kamalakaran Radharaman	28	11
Karen Shih	35	12
Lisa Stuber	29	11
Clarisse Tallah	36	12
Dustin Teuscher	52	14
Ho Ming Tong	45	13
Vigneshwar Venkat	30	11
James Waring	37	12
Melissa Watkins	54	14
Ricky Whelchel	53	14

# Recognitions

## Special Thanks:

Ms. Fadrika Prather, UROP Project Coordinator

Ms. Savannah Gowdy, UROP Student Assistant

Faculty and Graduate Student Judges from the schools

Student Advisory Board for Undergraduate Research (SABUR)

Oral Session Moderators:

Mr. Mitch Keller, Math

Ms. Ann Blasick, DOPP

Dr. Tris Utschig, CETL

Dr. Karen Adams, Fellowship Communication Program

Dr. Karen Head, CETL

Ms. Bethany Naser, FASET

Ms. Heather Smith, CETL

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Ms. Beth Spencer, Undergraduate Studies

Ms. Nicole Leonard, Honors Program

Mr. Matt Erwin, Undergraduate Studies

Ms. Thania Cantave, Undergraduate Studies

Ms. Natasha Lawson, Undergraduate Studies

Ms. Sue Woolard, Assessment

Ms. Donna Riley, Assessment

Ms. Aleta Way, Graduate & Undergraduate Studies

Ms. Shawna Garcia. IBB

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