University of Minnesota

2005 Institute of Technology Summer Undergraduate Research Expo

Thursday, August 11, 2005
4-6:30 p.m.
Memorial Hall, McNamara Alumni Center
University of Minnesota
2005
INSTITUTE OF TECHNOLOGY
SUMMER UNDERGRADUATE RESEARCH EXPO

Poster Presentations
Listed by presenting author and sponsoring program.
For abstracts, see http://www.mrsec.umn.edu/itsure.html

1. Hanrahan, Benedict, Joel Bell, Chris Macosko
   Image Analysis of Polymer Samples
   Home Institution: University of Minnesota
   Sponsor: Chemical Engineering and Materials Science

2. Nagpal, Umang, Chris Macosko, Jianbin Zhang
   Correlation Between Adhesion and Functional Polymer Concentration in Block Copolymers
   Home Institution: University of Minnesota
   Sponsor: Chemical Engineering and Materials Science

   Constructing a Pulsed Electron Beam Apparatus
   Home Institution: University of Minnesota
   Sponsor: Chemical Engineering and Materials Science, Coating Process Fundamentals

4. Albright, Aurora, Karin Musier Forsyth
   New Methods for Making in vitro tRNA for Use in X-ray Crystallography
   Home Institution: University of Minnesota
   Sponsor: Chemistry

5. Antipova, Anna, Lev Lis, Steven Kass
   Synthetic Progress Towards the Structural elucidation of a Cyclopropene Anion and its Inversion Barrier
   Home Institution: Institute of Organic Chemistry of Russian Academy of Sciences, Moscow
   Sponsor: Chemistry – LANDO

Towards the Total Synthesis of (+)-Gigantecin: Synthesis and Purification of Fragment 3 and its Precursors
Home Institution: Coe College
Sponsor: Chemistry – LANDO

7. Buck, Eric E., Thomas R. Hoye, Christopher S. Jeffrey
Studies Toward the Synthesis of Erysotramidine-the Alkylation of 6, 7-Dimethoxyl-1-Methyl-3, 4-Dihydroisoquioline
Home Institution: University of Minnesota
Sponsor: Chemistry

8. Coduluto, Stephen, R. Lee Penn
Controlling Zinc Oxide Nanoparticle Growth Using Various Synthetic Conditions
Home Institution: University of Minnesota
Sponsor: Chemistry – HEISIG

9. Comellas, Gemma, R. Lee Penn, William A. Arnold, Chan Lan Chun
Kinetic and Microscopic Studies of Organic Contaminants on Goethite
Home Institution: Universitat de Barcelona
Sponsor: Chemistry – LANDO

10. Glab, Kristin, Son Nguyen, Craig Forsyth
Synthesis of the C27-C40 Domain of Azaspiracid
Home Institution: Vanderbilt University
Sponsor: Chemistry

11. Hompesch, Richard, Besik Kankia, Karin Musier-Forsyth
Novel Quadruplex-based Optical Assay as a Model for Strand Exchange Reactions in HIV-1
Home Institution: University of Colorado at Colorado Springs
Sponsor: Chemistry – LANDO

12. Jacobs, Michelle, Marc Hillmyer, Satish Kumar
Topographical Patterning Mediated by Surface Energy Gradients
Home Institution: University of Minnesota
Sponsor: Chemistry – HEISIG

13. Koseoglu, Secil, Philippe Buhlmann
Ion Selective Electrodes Based on a Guanidinium Ionophore
Home Institution: Middle East Technical University
Sponsor: Chemistry – LANDO
14. **Murphy, Michael, Nathan Wells, David Blank**  
*Photophysics of New Material for Organic Photovoltaics*  
Home Institution: Loras College  
Sponsor: Chemistry – LANDO

15. **Retka, Noah, Joe Fritsch, Kris McNeill**  
*Synthesis and Reactivity of Halo-vinyl Tetrphenylporphyrin Cobalt Complexes*  
Home Institution: St. John’s University  
Sponsor: Chemistry – LANDO

16. **Shrestha, Liza, Craig Forsyth**  
*Multi-step Synthesis of an Intermediate of Spirastrellolide A*  
Home Institution: Berea College  
Sponsor: Chemistry – LANDO

17. **Wray, Curtis, Darrin York**  
*Theoretical Prediction of Proton Affinities and Gas Phase Basicities of Hydrated Metal Ions*  
Home Institution: University of Nebraska – Lincoln  
Sponsor: Chemistry – LANDO

18. **Widboom, Tony, L. E. Scriven**  
*Intimate Flow Portraits*  
Home Institution: University of Minnesota  
Sponsor: Minnesota Supercomputing Institute

19. **Beauvais, Emily, Allen Goldman**  
*Effect of Ultraviolet Light on the Conduction of Tetracene in Field Effect Transistors*  
Home Institution: Augsburg College  
Sponsor: Materials Research Science and Engineering Center, Institute for the Theory of Advanced Materials in Information Technology

20. **Brewer, Damien, Janice Boercker, Eray Aydil**  
*Synthesis and Characterization of Oriented ZnO Arrays*  
Home Institution: Washington University  
Sponsor: Materials Research Science and Engineering Center

21. **Evans, Christopher, Frank S. Bates**  
*The Effects of Asymmetry on Domain Spacing and Orientation in Block Copolymers*  
Home Institution: University of Minnesota
22. **Fonseca, Miguel, Peter McMurry**  
*Laser Ablation Aerosol Mass Spectrometry*  
Home Institution: Polytechnic University  
Sponsor: Materials Research Science and Engineering Center, IGERT for Nanoparticle Science and Engineering

23. **Goblirsch, Brandon, Thomas Marsh**  
Home Institution: University of St. Thomas  
Sponsor: Materials Research Science and Engineering Center

24. **Jalbert, Brandon, Thomas Marsh**  
*Using Plasma Enhanced Chemical Deposition to Grow Silicon Nanowires*  
Home Institution: Florida State University  
Sponsor: Materials Research Science and Engineering Center, IGERT for Nanoparticle Science and Engineering

25. **Johansen, Aaron, David Dahl, Dan Dahlberg, Hyuk-Jae Jang**  
*Magnetic Force Microscopy [Ferromagnetic and Antiferromagnetic Switching Probabilities]*  
Home Institution: St. Olaf College  
Sponsor: Materials Research Science and Engineering Center, Institute for the Theory of Advanced Materials in Information Technology

26. **Lio, Wilber, David Norris**  
*Quantum Dot Bioconjugates*  
Home Institution: Iowa State University  
Sponsor: Materials Research Science and Engineering Center, Institute for the Theory of Advanced Materials in Information Technology

27. **Martin, Hermanus, James Kakalios**  
*Electronic and Optical Properties of a-Si:H Thin Films*  
Home Institution: Morehouse College  
Sponsor: Materials Research Science and Engineering Center, IGERT for Nanoparticle Science and Engineering

28. **Paulsen, Bryan, Kent Mann**  
*Synthesis and Characterization of Naphthalene-Capped Oligothiphenes for Use As Semiconducting Materials in Thin Film Transistors*  
Home Institution: Tri-State University  
Sponsor: Materials Research Science and Engineering Center

29. **Perry, Glen, Xiaoyang Zhu**
30. **Reaves, Cletis, Alhad Phatak, Frank Bates**

*Effects of Block Sequencing on Mechanical Properties of Polyolefin-containing Block Copolymers*

Home Institution: Florida A&M University
Sponsor: Materials Research Science and Engineering Center

31. **Redline, Erica, Chris Macosko**

*Effects of Composition and Processing on the Morphology of PS/PMMA Blends*

Home Institution: Pennsylvania State University
Sponsor: Materials Research Science and Engineering Center

32. **Schaefer, Michaela, Paul Crowell**

*Ferrofluid Phenomena: The Effects of Constant and Time-Varying Magnetic Fields on Magnetic Liquids*

Home Institution: University of South Carolina
Sponsor: Materials Research Science and Engineering Center, Institute for the Theory of Advanced Materials in Information Technology

33. **Shearer, Paul, Christopher Leighton, Jing Wu**

*Magnetization as a Function of Temperature in a La-Pr-Sr Cobaltite*

Home Institution: University of Minnesota
Sponsor: Materials Research Science and Engineering Center, Institute for the Theory of Advanced Materials in Information Technology

34. **Tam, Joanny, Victor Barocas and Paul Hattan**

*Micro-Channels (Mcs) for Protein Crystallization Micro-Array (CRYMA)*

Home Institution: Polytechnic University of Puerto Rico
Sponsor: Materials Research Science and Engineering Center

35. **Wise, Adam, Allen Goldman**

*Insulator-Superconductor Transitions in Indium Oxide Thin Films*

Home Institution: Rensselaer Polytechnic Institute
Sponsor: Materials Research Science and Engineering Center, Institute for the Theory of Advanced Materials in Information Technology

36. **Wydra, James, C. Daniel Frisbie**

*Synthesis of Air Stable Polythiophene with Applications for Organic Photovoltaics*

Home Institution: University of Iowa
37. **Yust, David, Michael Tsapatsis**  
_Synthesis and Characterization of Zeolite – Polymer Composite Membranes_  
Home Institution: University of Minnesota  
Sponsor: Materials Research Science and Engineering Center

38. **Barrett, Laura, E. Dan Dahlberg**  
_Magnetic Tunnel Junctions from Sputtering to MRAM_  
Home Institution: Middlebury College  
Sponsor: Physics

39. **Blees, Melina, C.C. Huang, Mick Veum**  
_Liquid Crystals: Studies in Surface Tension_  
Home Institution: Carleton College  
Sponsor: Physics

40. **Guzzi, Anne, John Broadhurst**  
_The Physical Basis of Sound Memory_  
Home Institution: College of William and Mary  
Sponsor: Physics

41. **Hansen, Stephen, Dan Cronin-Hennessy**  
_Strangeness Counting in Psi(3770) Decays_  
Home Institution: Creighton University  
Sponsor: Physics

42. **Hazlett, Eric, Dan Cronin-Hennessy, Ken Heller**  
_Fiber Bend Test for Numi Off-Axis Neutrino Appearance Experiment_  
Home Institution: Colorado State University  
Sponsor: Physics

43. **Hendargo, Hansford, Joachim Müeller**  
_Creation of a Hollow Laser Beam for Use in Experimental Biophysics_  
Home Institution: Harvey Mudd College  
Sponsor: Physics

44. **Hooke, Alex, Jim Kakalios**  
_Effects of Nanoparticles in Amorphous Silicon Thin Films_  
Home Institution: University of Maryland  
Sponsor: Physics
45. Jozwiak, Julie, Prisca Cushman
**Ba Calibration Trending and Beta Correlations with Respect to Position and Energy**
Home Institution: Cornell College
Sponsor: Physics

46. Juwono, Benedectus, Peter J. Litchfield
**In Search of Electrons**
Home Institution: University of California – San Diego
Sponsor: Physics

47. Krueger, Benjamin, Allen Goldman
**Quantum Interference Effects in Conducting Glass**
Home Institution: Drake University
Sponsor: Physics

48. MacGregor, Robert, Cynthia Cattell
**An Analysis of CME Shocks**
Home Institution: Rice University
Sponsor: Physics

49. Raach, Kate, Paul Crowell
**Defects in Ferrofluids**
Home Institution: University of Minnesota
Sponsor: Physics

50. Dixon, Scott, Ling Zhang, Chris Macosko
**The Effects of Bio-based Polyols on Polyurethane Foam Properties**
Home Institution: University of Minnesota
Sponsor: UROP