

2009 Sigma Xi Research Day Schedule of Events

Thursday, April 30

3:00-4:30 pm Registration (2nd floor, Science Bldg.)
Poster set-up (2nd floor, Science Bldg.)

4:00-5:00 pm Poster session 1
Poster judging

4:00 -5:00 Pm Vendors, S212
Displays (2nd floor, Science Bldg.)

5:00-6:45 pm Oral Presentations
BBSC 102, Refreshments

Friday, May 1

9:00-9:30 am Registration (2nd floor, Science Bldg.)
Poster set-up (2nd floor, Science Bldg.)
Refreshments

9:30 -11:30 am Poster session 2
Poster judging

9:30 -11:30 am Vendors, S212
Displays (2nd floor, Science Bldg.)

11:30 am Luncheon, Morrow Commons

12:00 pm Keynote address: Morrow Commons
Dr. Tom Wilson, Physics Department, Marshall
University, "Novel Method of high-frequency (terahertz)
acoustic wave generation and detection"

1:00 pm Student Awards

KEYNOTE ADDRESS

MAY 1, 2009

12:00 PM

MORROW LIBRARY COMMONS

NOVEL METHOD OF HIGH-FREQUENCY (TERAHERTZ) ACOUSTIC WAVE GENERATION AND DETECTION.

Tom Wilson

Physics, Marshall University

I will review the progress of my NSF-funded research that explores a novel method for the direct-excitation of THz acoustic phonons (quanta of harmonic oscillations of crystal lattice) in nano-layered doping structures (superlattices) in (100) silicon by the resonant absorption of a high-power pulsed far-infrared laser radiation. The many experimental challenges will also be discussed including the design and operation of a custom far-infrared laser, the coupling of the radiation onto the sample while the latter is immersed in low-temperature liquid helium and while under uniaxial stress (up to several kilo atmospheres of pressure), the superconducting microbolometer detector's fabrication and characterization, and the use high-speed electronics and LabView for data acquisition and experimental control. Applications such as the development of a cryogenic acoustic microscopy with nm-resolution will also be described.

ORAL PRESENTATIONS

APRIL 30, 2009

5:00 – 6:45 PM

ROBERT C. BYRD BIOTECHNOLOGY BUILDING 102

5:00: Refreshments.

- O1 5:15: Massimo Bardi, Psychology Department**
Behavioral and neuroendocrine correlates of flexible coping
- O2 5:30: Marcia Harrison, Biological Sciences**
Using MATLAB to process images for the analysis of plant organ growth and curvature
- O3 5:45: Danielle Clark, Chemistry Department.**
A study of amino acid galactation sites in human albumin.
- O4 6:00: Zachary Tackett, Integrated Science and Technology.**
Identification of fluoroquinolone resistance genes and proteins in *Staphylococcus aureus*.
- O5 6:15: Gregory Sammons, Biological Sciences.**
Development of adult-derived stem cells for Parkinson's disease therapy.
- O6 6:30: Jacob Kilgore, Chemistry Department.**
Mass spectrometry of polypropylene imine (PPI) dendrimer-metal nanocomplexes.

POSTER PRESENTATIONS
SCIENCE BUILDING, 2nd Floor

BIOMEDICAL SCIENCES

BMS1 Sasha N. Zill, Anatomy and Pathology

Force feedback depends upon receptor location

BMS2 Steven Davis, Pharmacology, Physiology and Toxicology

Comparison of histamine content in b16f10 melanoma cells and nontumorigenic melan-a melanocytes

BIOLOGICAL SCIENCES

BSC1 Allison Belcher, Biological Sciences

Effects of gaga binding elements on the conformation of DNA in the hsp70 promoter

BSC2 Bianca Lycans, Biological Sciences

Eicosapentaenoic acid inhibits growth and induces apoptosis of human multiple myeloma cells

BSC3 Rachel Blake, Biological Sciences

A novel method for determining d-galactose in biological fluids

BSC4 Kathleen Brown, Biological Sciences

Anti-angiogenic activity of mg624 in primary human lung endothelial cells

BSC5 Terry N. Boyce, Jr., Biological Sciences

Role of pten in mouse oocyte development

BSC6 Nick M. Gardner, Biological Sciences

Investigations into the structure of lizard mandibular symphyses

BSC7 William Kelly, Biological Sciences

High-density bioreactor fermentation of the microalga *Chlorella pyrenoidosa* for bio-diesel production

BSC8 Laura E. Mitchell, Biological Sciences

The role of familiarity in determining social dynamics among crayfish

BSC9 Megan Powers, Biological Sciences

Development of a new procedure for visualizing *Drosophila melanogaster* photoreceptors

BSC10 Adam Short, Biological Sciences

Comparative genomics of diverse isolates of *Acanthamoeba*

BSC11 Joshua S. Titlow, Biological Sciences

Neuromuscular control in a postural perturbation model

BSC12 Jason Van Metere, Biological Sciences

Effects of diet on crabp-1 expression in prostate cancer cells

BSC13 Johnathan Gunno, Biological Sciences

Retinoic acid induces the inhibitor sfrp1 in human melanoma

BSC14 Mia L. Brown, Biological Sciences

Evaluating potential hormone cross talk between auxin and ethylene in *Arabidopsis*

BSC15 John D'Angelo, Biological Sciences

Comparison of salinity stress and aluminum toxicity on *Arabidopsis thaliana* mutants.

BSC16 Megan Stephenson, Biological Sciences

Characterization of coumarin-induced growth and stress responses of *Arabidopsis thaliana*

BSC17 Hannah Mick, Biological Sciences

Evaluation of *Arabidopsis* germinated in hypergravity and induced gravitropism

BSC18 Josh Adkins, Biological Sciences

Analysis of possible chloroplast movement factors

BSC 19 Carson Donald, Biological Sciences

The effect of quercetin on growth of human melanoma cancer cells

CHEMISTRY

CHM1 Tiffany Bell, Chemistry

Examination of the primary structure of prohibitin

CHM2 Brennon Chambers, Chemistry

Ab initio study of oh...x (x=methane, acetylene) van der waals complexes

CHM3 Charles Lowe, Chemistry

Ab initio study of oh...x (x=co, ethylene) pre-reactive complexes

CHM4 Justin Evans, Chemistry

Synthesis and characterization of tricarbonyl (tetraphenylcyclopentadienyl) manganese(i)

CHM5 Johannes Fahrman, Chemistry

Characterization of phthalocyanines and phthalocyanine derivatives via theoretical spectroscopy

CHM6 Emily John, Chemistry

The investigation of *Escherichia coli* magnesium riboswitches by shape chemistry

CHM7 Francesca Karle, Chemistry

What's growing on your contacts? An SEM survey of lenses and cases from healthy and diseased individuals

CHM8 Eric Martin, Chemistry

Modeling generation 1 nitrile-terminated polypropylene imine (PPI) dendrimer fragmentation patterns using density functional theory (DFT) methods and calculations

CHM9 Kristen Pack, Chemistry

Elucidating fragmentation mechanisms of metal complexes with nitrile-terminated ppi

CHM10 Anuradha Rajulapati, Chemistry

Development of system and methods for the sub-pixel resolution characterization of nanoscale constructs containing multiple fluorophores

CHM11 Srinivasarao Thulluri, Chemistry

Comparative study on cu/zn-sod, mn-sod and bace1 expression and distribution in young and aged rat brain tissue

CHM12 Kathy Marie Tuttle, Chemistry

Resveratrol effects of cisplatin

CHM13 Jeremy Wilson, Chemistry

Synthesis of a new fluorescent imidazolium dye

CHM14 Jacob T. Kilgore, Chemistry

Mass spectrometry of nitrile-terminated first generation polypropylene imine (ppi) dendrimers

GEOLOGY

GEO1 Lauren A. Brewster, Geology

Acid mine drainage--impact on streams

GEO2 Howard Douglas Peters, Geology

Study of the mechanics of failure in sandstone overlying weathering shale in the Appalachian region

GEO3 Jacob S. Mathis, Geology

Determining unknown mineral specimens through use of accelerated flowchart

GEO4 Chloe Suzanne Wonnell, Geology

Elemental analysis by SEM of ordovician brachiopod and bryozoan fossils

INTEGRATED SCIENCE AND TECHNOLOGY

IST1 Christabel Cobbina, Integrated Science and Technology

Assay development for cellulosic breakdown of biomass to produce ethanol

IST2 Brian Bridgewater, Integrated Science and Technology

Substrate characterization and its relationship to benthic fish communities

MATHEMATICS

MTH1 Maggie Chenoweth, Mathematics

A numerical study of generalized multiquadric interpolation

PHYSICS

PHY1 Josh Hafer, Physics

Simulations of an exact Einstein solution on supercomputer

PHY2 Howard Richards, Physics

Irreversibly growing droplets on small-world graphs

PHY3 Daniel Velazquez, Physics

Stark effect on a Wannier-Mott exciton in a semiconductor quantum dot

PHY4 Matthew Seitz, Physics and Chemistry

Porous Nanocrystalline TiO_2 Structures for Photovoltaics