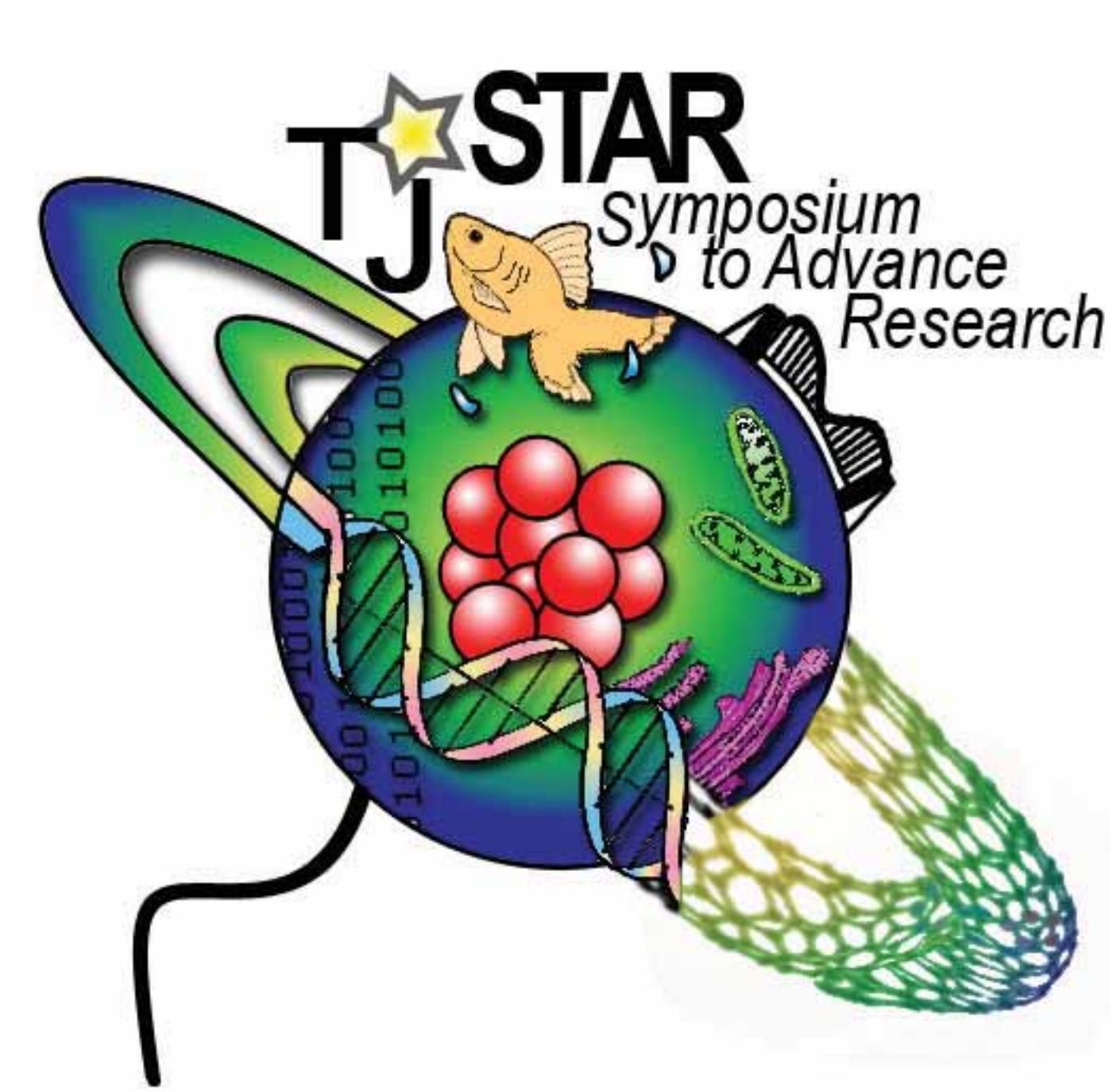
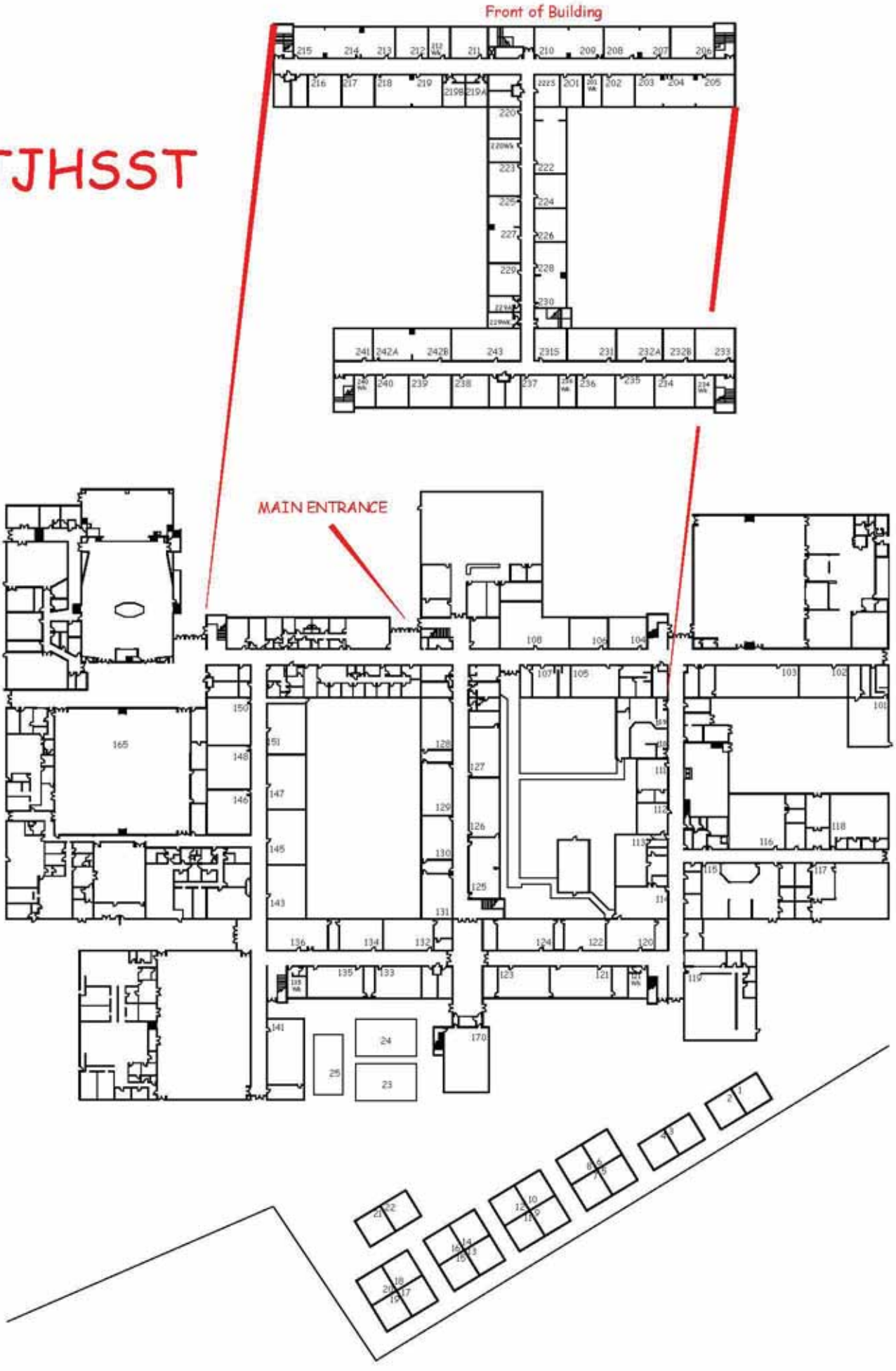
Thomas Jefferson High School for Science and Technology



May 28, 2009

6560 Braddock Road, Alexandria, Virginia 22312

TJHSST



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tjSTAR Symposium to Advance Research

A day to celebrate all things research!

Contents

Thank you to all of our attendees!

Introducing tjSTAR,

Dr. Evan Glazer, Principal

Welcome to the inaugural Symposium to Advance Research for Thomas Jefferson High School for Science and Technology (tjSTAR). This is a great opportunity to view hundreds of creative and innovative science and technology projects designed by our students as part of their coursework throughout the school year. During this special school day, we celebrate our students' research spanning from freshman IBET (Integrated Biology English and Technology), sophomore CHUM (Chemistry and Humanities), to our senior science and technology research labs and mentorships. Older students can learn about their peers' work, and younger students can witness the many possibilities they can pursue while they are at TJ.

In addition to the research sessions, students can attend interactive workshops, listen to expert speakers on panels, participate in design competitions, and explore innovative technologies through demonstration sessions. Students have opportunities to meet professionals who are connecting research to real world problems.

In addition to our own stars, this day would not be possible without the leadership and support from our community partners. They have contributed exponentially to this program, not only through monetary donations and research equipment for our labs, but through their time and scientific expertise as well.

Use this day as an opportunity to not only learn about what can be done at TJ, but what you can do, both individually and collaboratively, to contribute to a field of research in the future. Have a remarkable day!

Keynote Speaker

Secretary of Education,

Mr. Arne Duncan

Arne Duncan was nominated to be secretary of education by President-elect Barack Obama and was confirmed by the U.S. Senate on Inauguration Day, Jan. 20, 2009.

In his confirmation hearings, Duncan called education “the most pressing issue facing America,” adding that “preparing young people for success in life is not just a moral obligation of society” but also an “economic imperative.” “Education is also the civil rights issue of our generation,” he said, “the only sure path out of poverty and the only way to achieve a more equal and just society.” Duncan expressed his commitment to work under the leadership of President Obama and with all those involved in education “to enhance education in America, to lift our children and families out of poverty, to help our students learn to contribute to the civility of our great American democracy, and to strengthen our economy by producing a workforce that can make us as competitive as possible.”

Prior to his appointment as secretary of education, Duncan served as the chief executive officer of the Chicago Public Schools, a position to which he was appointed by Mayor Richard M. Daley, from June 2001 through December 2008, becoming the longest-serving big-city education superintendent in the country. In seven and a half years, he united education reformers, teachers, principals and business stakeholders behind an aggressive education reform agenda that included opening over 100 new schools, expanding after-school and summer learning programs, closing down underperforming schools, increasing early childhood and college access, dramatically boosting the caliber of teachers, and building public-private partnerships around a variety of education initiatives.

Duncan graduated magna cum laude from Harvard University in 1987, majoring in sociology. He was co-captain of Harvard’s basketball team and was named a first team Academic All-American. He credits basketball with his team-oriented and highly disciplined work ethic.

For Secretary of Education Arne Duncan’s extended biography, please visit:
http://www.ed.gov/news/staff/bios/duncan.html

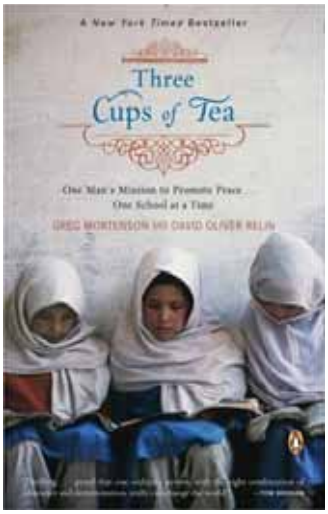
TJHSST One Question

What if we all asked the same question?
What if we all answered it together?
How could a question change our life at TJ?
How could our answers affect the world beyond our building?

In the 2009-2010 academic year TJ will inaugurate a new initiative, in which the whole school community will be invited to focus on One Question. Students had the opportunity in February of 2009 to propose an open-ended and challenging question that would connect science, math, or technology to the needs of our world. Five top questions were selected from all student proposals, and the school community then chose the final question through online voting.

That question will serve as inspiration for the TJ community during the coming school year. It will be addressed through various avenues, according to student and faculty interest: a semester course, subject classes, 8th period activities, speaker series, research projects, etc. Students and teachers may also apply for grants to pursue the One Question.

The 2009-2010 One Question is
"What are the social responsibilities of educated people?"
submitted by Ian Ladner, class of 2012.



During the summer of 2009 Thomas Jefferson will continue its "One Book" tradition, in which the entire TJ community reads the same book during the summer. This summer's book selection, ***Three Cups of Tea***, by Greg Mortenson and David Oliver Relin, will serve as a spring board for discussions on the social responsibilities of educated people.

http://academics.tjhsst.edu/oneq/index.php

Thanks to our Sponsors

The generosity of our sponsor partners in their strong demonstration of support for tjStar is much more than a simple agreement to fund an event. It is an affirmation of the great expectations of business and civic leaders and individuals that TJHSST will deliver on its promise of advancing educational excellence and producing future leaders of our community and nation.

We are deeply grateful for the responsiveness of our many partners in supporting the May 28th research symposium and for their confidence in our school, its leadership and faculty, and our terrific students.

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Acknowledgements

The first annual tjSTAR is a day to celebrate all things research at TJ, and it could not have happened without the assistance of so many from throughout the TJ community. Hard-working students, staff, parents, business partners and friends of TJ have come across the metropolitan area, and several from across the county, to dialogue, debate and challenge each other to seek scientific solutions to the problems of today. We are a community of learners, each with a responsibility to share our knowledge and experiences in the name of research. Senior Tech Lab Directors, IBET teams, mentors and individual teachers who have worked with students pursuing independent research opportunities outside of the classroom are to be commended for the fine job that they have done with our students. Other staff and community members have generously offered their time to lead workshops, organize panels, invite speakers, sponsor student clubs, and lend a hand to the countless tasks and committees that make a day like this possible. TJ's stars really shine!

In addition to the assistance indicated above, the contributions of the following individuals, teams and organizations warrant additional thanks:

tjSTAR webpage creators and curators: Angela Tran, Jennifer Lee, Daniel Kang.
Xiaoxiao Lin
David Ensey
US Department of Education
FCPS Cluster III Office
TJ Partnership Fund
8th Period Office
Bernadette Saperstein
TJ PTSA
TJ Tech Team
Pete Morasca
TJ Security Team
TJ One Question Committee
tjSTAR Steering Committee
Jennifer Hertzberg

Tj STAR Overview of Schedule
May 28, 2009

Activities	IBET Presentations	Senior Research and Mentorship Presentations	CHUM	Workshops	Design Challenges	Speakers	Panels	Demonstrations and Hands-on Activities
Description	All TJ Freshmen will be presenting their year-long IBET research projects	All TJ Seniors will be presenting their year-long senior Tech Lab and/or Mentorship projects.	The Chemistry-Humanities students will be presenting their projects on molecules that changed the world.	Topical, interactive presentations on original research by TJ students, TJ faculty or invited guests	Teams of TJ students will be in competition to solve fun, real-world engineering problems.	Experts from mathematics, science and technology organizations will lead discussions about current innovations.	Researchers come together to share divergent perspectives on current issues in math, science and technology.	An opportunity for TJ students and faculty to experience the latest research projects or products.
8:30 - 8:50	A Block: All students report to TA; attendance taken, TjSTAR student schedules distributed.							
9:00 - 10:10	B Block : Session B All students will sign up via Intranet for one activity during this session.							
10:10 - 10:20	Change Classes							
10:20 - 11:30	C Block : Session C All students will sign up via Intranet for one activity during this session.							
11:30 - 12:15	Lunch							
12:15 - 1:25	D Block : Session D All students will sign up via Intranet for one activity during this session..							
1:25 - 1:35	Change Classes							
1:35 - 2:45	E Block : Session E All students will sign up via Intranet for one activity during this session.							
3:00 - 3:50	F Block: One Question, One Book Presentation and Keynote Speaker: U. S. Secretary of Education Arne Duncan							

Concurrent Sessions

B
9:00 a.m.- 10:10 a.m.
IBET presentations

Room 120

Heart Rate's Affected by Caffeine? Extreme.
Guanmei Liang, Anastasia Georgiou, Yohan Sumathipala, and Connie S

Living on the Edge.
Esther Lee, Alice King, Flint Song, and Marvin Qian

Fertilizer Race.
Quynh-My Luu, Alexandria Sutton, and Jonathan Youssef

Does Humus Humor Pea Plant Growth?
Rekha Schnepf, Tushar Kamath, Rishi Malhotra, and Zach Hasan

Room 121

On What Side Is the Grass Greener Anyway?
Katy Burgio, Tim Song, Omer Ahmed, and Sarah Munyan

Grounds for Relief.
Stewart Hahn, Matthew Callahan, Akhila Ananthram, and Sarah Sam

Different Lights Make Different Heights.
Ben Boinay, John Chae, and Nick Kousen

Drinking Nuclear Waste.
Kyle Withers, Joyce Su, Austin Dunn, and Maham Sohrab

Room 123

Graze the Roof.
Gabe Boning, Robbie Clark, Daniel Jacobson, and Katie Morley

Deer Populations Gone Wild!
Matt Bujor, Brad Hodge, Mary Kate Dilworth, and Colleen Marshall

Constructed Copycats: Filling in the Gaps.
Vidya Ganesh, Niki Hua, Patricia Li, and Rafa Rahman

Raise the Roof.
Aleena Ijaz, Megan Clark, Molly Shannon, and Nathan Keithline

Room 125

Defecation Deposition!
Mike Bunting, Max Miroff, Kunyao Yu, and Emilie Anderson

Room 125 (continued)

Hyperactice Hearts.
Zikuan Li, Jongyeop Lim, and Alex Yang

Macroinvertebrate Monitors.
Helen Hastings, Debra King, Chris Mills, and Jesse Witkowksi

Room 131

Everything in Its Proper Place.
Dylan Keightley, Philip Meyers, Taylor Reffett, and Meghna Khosla

Blind Planarians Run From Scary.
Alex Chen, Yurianna Huh, and Gayatri Sardana

What's the Score with NH_4?
Meredith Burkle, Priyanka Dochibhotla, Emily Harmon, and Anish Tondwalkar

Room T5

Aquatic Plants: Mr. Clean Gone Green!
Saul De La Barra, James Miller, Ana Mishra, and Pavan Naik

Do Deer Need Privacy?
Brody Marino, Nick Allegro, Jackie Dallaire, and Elizabeth Steele

Drowsy Daphnia Multiply.
Rabia Idrees, Arjun Srinivasan, and Mihir Srivastava

Green Roofs: Growing Up.
Christine Jacobs, Elizabeth Johnson, Ryan Yan, and Joseph Yoon

Room T6

The Power of the Microbe.
Zach Williams, Serena Lei, Ally Walsh, and Paul Yea

Nitrate and Dissolved Oxygen: A Correlation or a Coincidence?
Kate Gaziano, Stephen Daniel, Yongmin Cho, and Andrew Kim

Planaria/Regenerating Under the Influence.
Tien Bui, Gillie Cuda, Elizabeth Nguyen, and Ashley Park

The Sound Effect.
Justine Lee, Elisabeth von Spakovsky, and Lianna Yang

IBET presentations continued

Room T7

Let's Get Dizzy.
Peter Reischer and Benjamin Torczon

Changing the Ingredients of Compost: A Hot Topic.
Mayank Jain, Eric Lee, Grace Moon, and Tabor Tritschler

Senior Research and Mentorship Presentations

Astronomy & Astrophysics Planetarium

Approximation of Past Solar UV Irradiance Using Proxy Data.
Tim Zhu

Analysis of Spectral Lines from Active Solar Regions.
Pooja Vinayak

Retrieving and Interpreting Radio Signals with Radio Jove.
Jackie Fitzsimmons and Teresa Ventura

Detection of Exoplanets in Radio Bands C and X.
Lara Howerton, Amy Mapes, Elana Urbach, and Harry White

Radio Emissions from Supernova 2008ax.
Ranya Brooks

Biotechnology
Room 113

Suspended Animation of Caenorhabditis Elegans Using Various Concentrations of Alkanols.
Katie Aliaga and Michelle Choi

Removal of Arsenic from Drinking Water Using Methods of Bioremediation.
Sofia Garakyaraghi

The Effect of Sterols on Basal Cell Carcinoma Proliferation and Hedgehog Signaling Pathway Expression.
Megan Jang and Rosa Kang

Room 113 (continued)

Examination of Bdelloid Rotifer Genome in Philodina Roseola for the Retrotransposon Vesta.
Kate McLaughlin and Srilakshmi

Room 114

The Effects of Amount of Caffeine on TORC1 Protein Kinase in Saccharomyces Cerevisiae.
Kristin Nguyen and Angela Tran

The Effects of Latrotoxins and the DNRX Mutation on Neuromuscular Junctions on Drosphila Larvae.
Emma Pierson

The Hypermethylation of p15, p16 and Related Genes and Its Relationship to Acute Myeloid Leukemia.
Amanda Cain and Bobbie Pelham-Webb

Relative Effectiveness of Lactobacillus Casei and Saccharomyces Cerevisiae at Removal of Zn, Cu, Co, and Cd from an Aquatic Environment.
Camille Vu

Room 143

The Estrogenic Activity of Chinese Licorice Root (*Glycyrrhiza radix*) Extracts on Rat Adenocarcinoma Cells.
Yun Ji Choi, Autrine Loghmanian

The Use of Anti-sickling Hemoglobins in Gene Therapy for Sickle Cell Disease.
Blaire Claytor

Derivation of a Bioluminescent Glucose Detector from the pUCD615 Plasmid.
Kamila Goldin

The Influence of Dopamine on Membrane Expression of AMPA Receptor Subunits in Rat Hippocompal Neurons.
Charles Guo

Room 126

The Over Expression of KLF4 in Fibroblast Cells in Culture.
Pavi Anand

Senior Research and Mentorship Presentations continued

Room 126 (continued)

In vivo Intravenous Ascorbate with Gemcitabine in Murine Models of Pancreatic Cancer.
Steve HeeSung Kim

The Role of CREB in the Downregulation of Cyclin D1 by Tumor-Suppressor RASSF1A.
Jessica Liu

Purification and Analysis of A SMO antibody for Cancer Detection.
Shu Liu

Room 127

Determination of Plasma Carboxylesterase Activity for the Validation of Animal Models for Studying Nerve Agent Toxicity.
Elysha Dinh

Differential Inhibition of Tissue Acetylcholinesterase and poraoxonase-1 Following Inhalation Exposure to Chemical Warfare Nerve Agent Soman in a Guinea Pig Model.
Sharon Long

Reactivation of Human Butyrylcholinesterase Inhibited by Organophosphorus Nerve Agents.
Stephanie Valerezo

Characterization of Intracellular Amylase Activity in Streptococcus gordonii V288.
Lorna Zhang

Chemical Analysis
Room 103

Recovery of Zn and MnO2 by Acid Leaching.
David Besson and Yuwan Xu

Novel Form of Alternative Energy: Mediator-Assisted Self-Repairing Photoelectrochemical Solar Cell Production of Biodiesel from Algae Oil.
Carolyn Scoggins and Jessica Ungerleider

Room 103 (continued)

The Effect of Sodium Butyrate on the Acetylation of Histone h4 in Schizosaccharomyces Pombe Yeast.
Lily Hsiang

Room 129

Biodegradable Plastic Analysis & Fuel Generation.
Peter Im and Ami Jo

Photocatalytic Decomposition of Dyes from Common Fibers.
Tanuja Potdar and Kylene Smart

Obtainment of Ethanol from Corn Stover by Fermantation.
Zoë Hoffman and William McGarey

Computer Aided Design
Room 104

Sustainable Design using LEED standards in a new TJHSST building.
Maya Chaudhuri

Redesigning TJHSST.
Kyle Lee

Reconstruction of TJ auditorium with a focus on Acoustics.
Lindsey Doane

Design of an Open and Functional Library for TJHSST.
Minhee Kim

An Investigation of Mass-Customized Architectural Louver Systems and the Effects on Daylighting Levels.
Jonathon Koa

Room 128

Design and Modeling of Retractable Roofing for NFL Sports Complexes.
Curtis Mills

Treadmill Desk.
Sharon Kavijan

Concert Venue With A Centrally Located, Rotating, Circular Stage.
Ben Choi

Senior Research and Mentorship Presentations continued

Room 128 (continued)

Obsco Ultimo - Designing an Obstacle Course for Children with Disabilities.
Kayley Sullivan

Computer Systems
Room 115A

Applications of Stochastic Processes in Asset Price Modeling
Preetam D'Souza

Economic Policy Simulation and Optimization.
Peter Le

Econometrics Modeling.
Theo Gutman-Solo

The Tragedy of the Commons as Applied to Traffic.
Craig Haseler

A Traffic Simulation Model Allowing for Wide-ranged Vehicle Communication
Timothy Galvin

Traffic Model Simulation.
James Kaplan

Creating 2-D and 3-D Models of the Solar System Using Physics-Based Geometries in Java.
Brian Tubergen

AvaMol - Molecular Mechanics to Quantum Chemistry and Back.
Soltan Malekghassemi

Room 115B

A Cellular Automata Approach to Population Modeling.
Marika Lohmus

Room 115B (continued)

A System Dynamics Approach to Global Warming.
Junho Kang

System Dynamics Modeling of Community Sustainability.
Thomas Bettge

An Agent-Based Model of Reoccurring Epidemics in a Population with Quarantine Capabilities.
Brendan Greenley

The Tragedy of the Commons using Agent-Based Modeling.
Joshua Lee

Modeling the Effects of Disasters on Human Population and Resources.
Joshua Yoon

Energy Systems
Room 119

The Design and Fabrication of a Hydraulic Truck Bed Lift.
Jillian Buchheim

The Design and Implementation of an Compressed Air System for an Active Air Ride Suspension.
Alexandria Gallagher

The Design and Implementation of a Mechanism for Ride Control on a Bio-Fuel Vehicle.
Dinh Tran

The Design and Implementation of an Emergency Braking in a Bio-Diesel Fuel Vehicle.
Jonathan Wildes

Room 151

The Design and Implementation of a Battery Assembly for a Solar Powered Vehicle.
Spencer Brooks

The Design and Implementation of an Active Cooling System for the Driver of a Solar Powered Vehicle.
John Hife

Senior Research and Mentorship Presentations continued

Room 151 (continued)

The Design and Implementation of an Air Cooling System for the Batteries and Motor in a Solar Powered Vehicle.
Si Heon Ji

The Design and Implementation of a Brushless DC Motor System for the Propulsion of a Solar Powered Vehicle.
Jong Ho Nam

Microelectronics
Room 118

The Three-dimensional Object Mapping and reconstruction through Stereoscopic Image Processing.
Jama Mohamed and Julian Warchall

Sound Localization Utilizing a Microphone Array.
Spencer Adams and Tim Yu

Using an Array of Transducers in a Beamforming Scheme.
Colin Donohue

Examining the Potential of Open-Air Ultrasonic Sonar.
Marvin Yuen

Oceanography & Geophysical Systems
Room 124

Effect of Microhabitat Structure on Rhithropanopeus harrisii.
Sarah Bornbush, JeanMarie Stewart, Andrew Zukowski

The Effect of Diet on Shell Color Development in Abalone.
Leila Bushman

Comparison of Toxicity Levels in Potomac River Samples.
Lauren Corbett and Alice Chae

Room 124 (continued)

Effect of Algal Food Type on Feed Conversion Rate in Florida Fighting Conch.
Sarah Applegate and Adrienne Arditti

Room 130

Effect of Temperature on Balanus improvisus Recruitment in the Chesapeake Bay. 28.
Sheila Bushman and Emma Fuller

Effect of Light Pattern on Dinoflagellates.
Ujwal Neekelekantan

Effect of Elevated Temperature & Ultraviolet B Radiation on Anemone Bleaching.
Rebecca Corey and Jessica Tyler

Effect of Hydronamics on Acropora Growth.
Justin Loeb and Lauren Wolbarsht

Optics and Modern Physics
Room 101

Investigating the Role of Defects in the Sensor Response of SingleWall Carbon Nanotube Chemical Sensors.
Alexander Simon

Determining Dielectric Function of Crystalline Solids.
Naren Tallapragada

Novel Biosensor Utilizing Quinone Monolayer.
Joy Lee

Self-assembly and Biological Activation of Phosphoric Acid Monolayers on GaN and AlGaN.
Soonwook Hong

Characterization of Crystalline Oxide Gate Dialectrics.
William Minshew

Room 222

Effect of Resonance Quality in Split-Ring Resonators.
Kyle Markwalter

Enhancing Antenna Directivity with Metamaterials.
Eric Bomgardner

Senior Research and Mentorship Presentations continued

Room 222 (continued)

Usage of Microwave-Frequency Metamaterials to Redistribute Waves.
Xiaoxiao Lin

Assessing the Application of Nanochannel Glass Photonic Crystals as Metamaterials.
Yangbo Xu

Study of Two-Way Effect in Niti.
Scott Skirlo

Prototyping
Room 117

Integrating an Airbag Suspension System into a Cushman Truckster.
Hannah Ackerman

Design and Implementation of Regenerative Braking in a Cushman Truckster.
Zach Aman and Jed Metge

The Design and Implementation of a Skeletal Frame for a Solar Powered Vehicle.
John Botchko

Robotics
Room 116

Design of a Webcam-based Edge Detection System for Robot Vision.
Will Pitler

Sensor Implementation for an Automated Tourbot.
Joel Stein

Design and Fabrication of a Chassis for an Autonomous Touring Robot.
Mac Stevens

Tourbot Systems Integration and Control.
Eric Kolker

CHUM presentations

Room 205

Bucky Balls.
Amanda Cordray, Soon Kweon, Steven Olin

Silicon.
Connor Cheong, Alisha Geldert, Gaby Trigo

Uranium.
Andrew Barlow, Caroline Crockett, Graham Lobel, Michael Nguyen

Glass.
William Bergan, Tracy Esman, Allie Nelson, Andrew Rowberg

C
10:20 a.m.- 11:30 a.m.

IBET presentations

Room 120

Feeding Algae.
David Neuberger, Zeming Lin, Woojin Jun, and Jackie Duong

Ba-boom Goes My Heart.
Linda Ho, Katherine Jiang, Ellen Nguyen, and Pali Singh

Leafy Beasties.
Pritha Bhattacharyya, Kajsa Carlsson, and Suganya Sridharma

Organic Fertilizer: How Good Is It Really?
Paul Wolfteich, Michael Wattendorf, Chris Seok, and Kalvin Harrigal

Room 121

Our Fault, Their Heart: How Does Ammonia Affect Nature?
Chinmayee Balabhadrapatruni, Stacey Zhou, Kevin Karn, and Aravind Ponukumati

Unleash the Power of the Sun.
Ed Cai, Eashan Kaw, William Kozlowski, and Kevin Tong

Salamanders on Acid.
Alex Park, Joe Buellesbach, Doug Hearney, and Matt Greenspan

Green is the New Roof.
Nick Arango, Rachel Chuang, Allison Wang, and Zachary Yaro

Room 123

Creepy Crabs and Coke.
Burke Deutsch, KyungHen Lee, and Jin Soo Chung

The Humus Factor.
Lian Bloch, Daniel Kang, Ashley Paek, and Krishna Pai

Depth en Masse.
Cynthia Chen, Laura Durant, and Adrienne Gillevet

A Little Lemon in Your Water?
Sarah Stites, Stas Schaller, and Julia Sokolow

Room 125

Magneticly Unattracted.
Peter Shao, Alex Zaita, and Austin Neuberger

An Enlightening Perspective on Pollution.
Ian Ladner, Michael Poussard, Emily Saitta, and Katherine Yu

Ladybugs Under the Influence.
Jaewon Suh, Jared Golant, and Vijay Kuruvilla

Growing to the Beat.
Sam Prestwood, Lauren Bomgardner, and Christine Harris

Room 131

Just Keep Crawling, Crawling, Crawling.
Anastassia Kornillova, Faven Russom, and Melody Wong

Biodiesel: More from Less.
William Chen, Jacky Hennegan, Ashley Jhu, and Melanie Kim

A-Maze-ing Mealworms.
Claire Egan, Allie Ivener, Mia Jimenez, and Sage Williams

Crystal Clear Beach Water.
Vasilios Rajendra, Andrew O'Shea, Apurva Kasanagottu, and Cindy Zou

Room T5

Citric Volvox, Hidden Daughter Cells.
Reece Anderson, Hector Salazar, Stefanie Van Rafelghem, and Jason Ye

Aeration's Effect on Oxygen Saturation.
Robert Campion, Emily Gale, Bina Kakusa, and Sonica Saraf

The Trees Deer Hold Dear.
Becca Edelstein, Chichi Li, Minh Nguyen, and Jawahar Baddula

It's Lime Time!
Adrienne Doebrich, Timothy Eklund, Rachel Kumar, and Snigdha

Room T6

Death by Chocolate.
Karishma Popli, Aimi Nguyen, and John Choi

Which Plants are Hungry for Nitrogen?
Saritha Attanagoda, John Franzen, Seiyoung Jang, and Victor Weiss

IBET presentations continued

Room T6 (continued)

The Scat Is Nicer on the Other Side.
Noah Yoo, Peter Sulucz, Luke Gessler, and Nicholas Skeen

D.O. Daphnia.
Ryan Anderson, Autumn Chuang, Beck Giesy, and Kristy Shin

Room T7

Marvelous Magnetic Movement.
Brooke Kanarek, Peter Town, and Katie Bennett

Chicken Soup for the Soil.
Sara Asad, Mark Elias, Aki Gao, and Usnish Majumdar

Does Heat Make the Male Salamander Hot?
Vansh Kumar, Nishant Garg, Daniel Seidman, and Richard Wan

Aeration: The Promising Solution to Water Pollution.
Carl Haseler, Jane Pak, and Emily Ji

Senior Research and Mentorship Presentations

Astronomy & Astrophysics Planetarium

A Search for Giant Radio Galaxies Using the VLSS.
Josh Hall, Rebecca Justice, and Chris Pearson

Metallicity and Evolution of Faint Blue Galaxies.
Susan Lee

A Timeline of the Martian Atmosphere.
Emily Gillivet

Photoclinometry of Transverse Aeolian Ridges of Mars.
Peter Kye and Lauren Wendlberger

Biotechnology Room 113

A Comparative Analysis of the Freezing Efficiencies of Various Compounds in Breast Cancer Cells.
Katherine Dove

The Effect of Creatine on Protein Expression in Earthworms.
Andy Doyne and Connor Finch

Articular Cartilage Repair: Histological, Biochemical, and Mechanical Analyses of Chondrocyte-seeded Peptide-based Hydrogel.
Rukmini Goswami

The Effect of A-Tocopherol and Hypochlorous Acid on the Apoptosis Rate of Neural Cells in C. elegans.
Ryan Johnson and Maggie Voth

MicroRNAs: Regulators of Oncogene Expression.
Steven Kim

Room 114

The Effect of Proteasome Inhibitors on Endopolyploidy in Irradiated Tumor Cells.
Lisa Kong

The Effect of Baiacalein Exposure on MPTP-Induced Oxidative Stress in Dopaminergic Cells.
Katie Neitzke

The Effect of Certain Plant Hormones on Pitcher Formation by Nepenthes (cultivar Alata).
Brian Rabe

Pseudogenes: Determining the True Function of Once-thought Functionless Genetic Material.
Debjani Saha

The Effect of Duckwood and Water Hyacinth on Aquatic Nitrogen Levels.
Herman Aparicio and Jordan Kramer

Senior Research and Mentorship Presentations continued

Room 143

The Estrogenic Activity of Nonylphenol on Adenocarcinoma Cells.
Kathy Hutchinson

A Comparative Study of Brassia oleracea Sulforaphane and Synthetic Oxomate Affect on Rat Adenocarcinoma Cells.
Grace Ko and Dana Lee

The Relationship Between Light and Porosity on Photovalic Microbial Fuel Cells.
Clarice Lee

The Antibacterial Effects of Chitosan on Escherichia coli and Serratia macescens.
Sang Lee

Room 126

Wild-Type and Mutant Alpha-Synuclein as a Contributor to Lysosomal Dysfunction in M17 Neuroblastoma Models.
Samuel Clamons

Designing A Quantitative Real-Time PCR Assay To Detect Rickettsia sp. Strain RpA4.
Rahee Ghosh

Inhibition of Fibroblast Disease by Decorin.
Rishi Iyengar

The Effect of Tunicamycin Induced Unfolded Protein Response in Cockayne Syndrome B Fibroblast Cell Line 4992 and Normal Fibroblast Cell Line 580.
Afifah Khan

Room 127

Cellular Targets of A-ZIP Dominants.
Mounika Garlipati

Dissecting Drosophila Color-vision Circuitry Using Promoter Analysis in consort with the lexA-Split Gal4 System.
Sudha Guttikonda

The Role of p70 Ribosomal S6 Kinase in Regulating Mouse Embryonic Stem Cell Cardiomyogenesis.
LeeAnn Li

Chemical Analysis
Room 103

Investigation of Zinc Oxide Reduction Methods.
Nabil Ahmed and Matthew Fu

Characterization & Formation of Films Cast from Wheat Gluten.
Simon Ho and Varun Bansal

Synthesis of Coated Quantum Dots & Analysis of Characteristics.
Nick Martin and Arvind Rachamadugu

Room 129

Development of Cellulosic Ethanol from Newspaper.
Jacob Hanger and Anis Rashid

Analyzing Single Fibers Using Fourier Transform Infared Spectroscopy.
Christine Franzel and Jennifer Jones

Modifying Dyes to Optimize Efficiency of Dye-Sensitized Solar Cell.
Will Czaplyski and Simon Lee

Computer Aided Design
Room 104

Design and Modeling of a Multi-Use Stadium.
Joeseph Lattin

Design of a Green Home to be Built into a Mountaintop.
Evan Burch

Buddhist Architecture Comparison Study.
Elizabeth Parlett

Design of a Hurricane-Proof House.
Wesley Stukenbroeker

Classroom Design to Encourage Learning and Good Behavior Using Environmental Psychology.
Toby Loewenstein

Room 128

Green Museum Facility for the National Mall.
Maddie Whittle

Senior Research and Mentorship Presentations continued

Room 128 (continued)

Luxury Auto Design.
Austin Yager

Heart Theatre.
Mikey Kim

Designing a Theater.
Brian Pang

Computer Systems
Room 115A

Modeling Virus Transmission using Agent Based and System Dynamics Modeling.
Dheeraj Manjunath

Model of a Virus Outbreak on a Contained Population.
Conor Cahill

Simulation of the Spread of a Virus Throughout Interacting Populations with Varying Degrees and Methods of Vaccination.
Jackson DeWeese

A Cellular Automata Approach to Population Modeling.
Alexa Silverman

Artificial Intelligence in Agent-Based Modeling.
John Walsh

Evolving Cutting Horse and Sheepdog Behavior in a Simulated Flock.
Christopher Beacham

Room 115B

Applications of Genetic Algorithms.
Mary Linnell

Naïve Bayes Classification in Computational Linguistics.
Christina Wallin

Solving the Vehicle Routing with Multiple Multi-Capacity Vehicles.
Michael Sanders

Room 115B (continued)

Traffic Based Pathway Optimization.
Michael LeGore

TJHSST Hallway Traffic Simulation.
Paul Woods

Machine Learning of Bridge Bidding.
Daniel Emmons

The Implementation of Artificial Intelligence and Temporal Difference Learning Algorithms in a Computerized Chess Program.
James Mannion

The Implementation of Machine Learning in Checkers.
William Melicher

Energy Systems
Room 119

The Design and Construction of a Modular Photovoltaic Array for a Solar-Powered Vehicle.
Robert Bui

The Design and Implementation of Photovoltaic Modules on a Solar Powered Vehicle.
Daniel Granados

The Design and Construction of a Wireless Power Beaming Array.
Michael Kim

Room 151

The Design and Implementation of a Wireless Sensor Network for a Bio-Diesel Fuel Vehicle.
Jacob Daniels

The Design and Implementation of a Wireless Sensor Network for Data Acquisition on Internal Components of a Bio-Diesel Fuel Vehicle.
Wade Gong

The Design and Implementation of a Microcontroller Operated Flexible Fuel Management System for a Bio-Diesel Fuel Vehicle.
Ryan Vaughn

Senior Research and Mentorship Presentations continued

Microelectronics
Room 118

Using an Accelerometer to Measure the Efficiency of Rowing.
Natalie Lubsen

The Reverse-Engineering and Testing of a Switching Voltage Regulator.
David English

Developing a Discrete Component Class D Amplifier.
Andrew Tener

Development of an Alternative Energy Storage System Using Ultracapacitors.
Max Dreo

The Implementation of a Test to Speech (TTS) Synthesizer as the Payload on a Picosatellite.
Ashley Lewis

Neuroscience
Room 102

Selective Serotonin Reuptake Inhibitors (SSRIs) and Long-Term Facilitation in Aplysia californica.
Maita Esteban, Niaz Khan, Rey Perez

Electrophysiological Analysis of Ventral nerve Cord in the Cockroach.
Cameron McCord, Nadya Muchoney

Social-Status Determination in the Crayfish: Effects of Serotonin on Dominance Behavior.
Gloria Driessnack, Kate Ferraren

Oceanography & Geophysical Systems
Room 124

Toxicity & Hormonal Effects of Atrazine & Its Transformation Products.
Ali Ruth

Room 124 (continued)

Effect of Whey Protein as Alternative Protein Source on Growth of Tilapia.
Jessica Szelc and Huan Song

Comparison of Toxicity Levels in Wild vs. Farmed Salmon.
Stephanie Marris and Christine Pham

Study of Eyewall Replacement in Hurricanes.
Lee Picard

Room 130

Use of GIS Mapping Tools & Satellite Imagery in Tracking movement in Agassiz Glacier.
Viola Li

The Effect of Depth on Settlement Density of Barnacles & Other Benthic Organisms.
Rachel Eilbot and Jennifer Kobayashi

Effect of Light Intensity on Heart Rate of Green Shore Crab.
Stephane Glynn

Temporal Analysis of Escherichia Coli Sampling Methodology in Accotink Creek, Alexandria, VA.
Sophia Dudte

Optics and Modern Physics
Room 101

Effect of Dry Eye on Tear Film and Visual Acuity.
Justin Etkin and Michael Howard

Design & Development of Animated Computer Generated Hologram.
Logan Gates and Natalie Kirchner

Effect of Wavelength Change on Holographic Image.
Diana Goeller

Modeling an Optical Computer Based on Cellular Automata.
Andrew Rodriguez

Senior Research and Mentorship Presentations continued

Prototyping
Room 117

The Development and Construction of a hydraulic Lift Gate for a Cushman Biofuel Vehicle.
Mikas Kuprenas

Design of a Modular Stretcher System to Attach to a Cushman Truckster.
Ben Daly

The Design and Implementation of a Windsheild and its Release Mechanism for the Thomas Jefferson Solar Car.
Alex Au

Design and Implementation of a Battery Enclosure with Air Circulating Capabilities.
James Wiley

Design and Implementation of a Skin for a Solar Powered Car
Sarah Gesalman

Robotics
Room 116

Design and Construction of a Wireless Video System to Remotely Observe Wildlife.
Arthi Aravind

CNC Technique Implementation in the Design of a Drawing Robot.
Holly Trebing

Design of a Room-Mapping Robot Using Sonar Senors.
Aki Kodama

CHUM presentations
Room 205

Napalm.
Tristan Berger, Leah Gonzalez, Ciara Prencipe, Kevin Shu

CHUM presentations

Room 205 (continued)

Hydrochloric Acid.
Rebecca Kolkmeyer, Richard Nguyen, Willis Wendler

DDT.
Jackie Harris, Venkat Iyer, Lisa Yang

Fossil Fuels.
Omar Abed, Lianna Cramer, Hae Mee Kang, Anthony Lim

D
12:15 p.m.- 1:25 p.m.

IBET presentations

Room 120

It's Alimentary, My Deer.
Tom Hillenbrand, Melody Liu, Jacquiline Nguyen, and Bryce Summers

Aquatic Plants Make Water... Harder, Better, Faster, Stronger.
Danbi Kim, Angela Liu, Emilie Fortman, and Heather Storeide

20,000 Egg Masses Under the Sea.
Akhil Kolluri, Eric Jian, and Saketh Are

Growing Under Pressure.
Jacob Miller, Edward Reinsel, Veronica Peterkin, and Weina Bao

Room 121

Hibernation in Desperation with Exasperation.
Milan Patel, Ryan Tasker-Benson, and Patrick Yu

Boiled Duckweed for Dinner Anyone?
Rachel Goldstein, Jerry Wu, Latika Gulati, and Kevin Ko

Construction Makes Pollution Go Round… the Beltway.
Michael Ramada, Lucy Shi, David Kim, and Amanda Blair

Speed Racer: The Effect of Nitrate on the Heart Rate of Daphnia.
Richard Kuzma, Elizabeth Lee, and Stephanie Melendez

Room 123

Freqkout.
Karen Dang, Erika Fitzpatrick, Jennifer Hwang, and Jackie Tran

Plots Aren't For Squares.
Stephen Seliskar, Eric McShane, Laura Minnema, and Mimi Carolus-Hager

Baby, It's Cold Outside.
Ricky Short, Erin Slatery, and Aedan Collins

Fecal Matters.
Aaron Bland, Sarah Bok, Jeremy Loffredo, and Shannon Smith

Room 125

Resonating Regeneration.
Stacy Hong, Andrew Martin, and Dylan Vu

No Lake, No Stream, No Scat.
Albert Gural, John Renner, Preetam Jinka, and Jordan Myers

High Fiber Salamanders.
Jake Zucker, George Liang, and Graham Schmidt

Construction Conundrum.
Elena Alicea, Ben Silverman, and Elliot Simon

Room 131

The Caffeine is a Lie.
Jake Shields, Mathew Ferrell, Eddie Rim, and Kevin Peng

Scat a Doo Dat.
Rishav Adhikari, Nabila Ahmed, Albany Jacobson Eckert, and Kesh Shvets

pH: How Basic Are You?
Luke Birch, Yang Dai, Elaine Lee, and Alex Luu

Does Washington Wash Waste Into the Wivver?
Kelsey Rainey, Ben Rosenblum, Esther Wang, and Jessica White

Room T5

Turmeric Time I Are You Hydrated?
Peter Ahnn, Allison Crow, Anne Norland, and Aziz Yusupov

How Low Can You Go?
Joshua Baquedano, Brett Offutt, Victor Shao, and Bryan Williams

Watersheds: The Bigger the Better?
Edward Danyliw, Abraham Sachs, Divyanka Salona, and Katherine Sanders

Room T6

Rigged Reproduction.
Nathan Thillairajah, Yuqing Zhang, George Calley, and Elizabeth Ellor

Deer Overpopulation is a Scatastrophe.
Connor Hann, Rebecca Hyndman, and Gilbert Pitcher

Feeling the Heat.
Brendan Kim, Daniel Kim, and Darwin Li

IBET presentations continued

Room T6 (continued)

Thudding Hearts in the Ultraviolet Spectrum.
Alisha Sindhwani, Avi Mehta, Pranita Ramakrishnan, and Zhereng

Room T7

Not-So-Fatuous Flatworms!
Wills Johnston, Michael Maccannon, Dimitre Nitchev, and Shriram Sundararaman

Life is like a Box of Chocolates.
Neal Chaudhuri, Aakansha Nangarlia, Billy Nguyen, and Callan Corcoran

Jack and the Beanstalk…but where's Jack? And what's that Smell?
Lydia Hylton, Varun Kumar, Stephen Weischedel, and Eunice Wu

The Unseen Solar Cleaning Machine.
Eugene Cai, Hanna Kim, and Alex Napier

Senior Research & Mentorship Presentations

Astronomy & Astrophysics Planetarium

Radio Emissions from Supernova 2008ax.
Ranya Brooks

Detecting Near Earth Orbiting Asteroids.
Elana Urbach

Biotechnology Room 113

Simulation of horizontal gene transfer in order to investigate the effect of the expression of an ampicillin resistant gene on the resistance to oxacillin in Staphylococcus epidermis.
Glenn Hookey and Wooyoung Moon

PINKI mutation screening of Multiple System Atrophy (MSA) patients and the sequencing of the PINKI and DKI genes for MSA.
Ansha Islam

Room 113 (continued)

Variation in neurexin-1 mRNA sequence from lymphoblastoid and neuronal cells.
Yasmin Kamal and Esther Kim

Expression of the B-subunit of Cholera enterotoxin fused with Cholera accessory colonization factor in A. thaliana, Solanum tuberosum, and Lycopersicon lycopersicum.
Claire Kim

Room 114

The effects of intestinal microbiota on the mRNA levels of Peroxizome Proliferator-Activated Receptor (PPAR) Gamma in the intestines of Zebrafish and the level of total fatty acids.
Heesu Kim

A comparison of IgE antibody binding site on peanut allergen Ara h 1 and Ara h 2 with comparable allergens in tree nuts and legumes.
Carolyn McAllister

The effect of the expression of Heat Shock proteins from Drosophila melanogaster on continued gene expression following treatment with methylation-sensitive restriction enzymes.
Greg Vernon

The role of FV Leiden in laser-induced arterial thrombogenesis in zebrafish.
Amanda Vest

Room 143

The Effect of Natural and Synthetic Coenzyme Q10 and Vitamin C on Lipid Accumulation in 3T3-LI Adipocytes.
Natalie Medvedeva and Rashmi Reddy

Classification of Validity in Object Recognition Tests Using EEG Feature Selection.
Arvind Thiagaraja

Determination of Anti-Inflammatory Influence on Chondroitin Sulfate on LPS Stimulated THP-1 Cells.
Reghav Veluri

Senior Research & Mentorship Presentations continued

Room 143 (continued)

The Efficacy of Bioremediation for Various Bacterial Species in a Copper-Contaminated Environment.
Han Brian Jang

Room 126

An analysis of correlations between soluble biomarkers and non-alcoholic fatty liver disease.
Gina Jin-Ah Kim

Development of a Novel DNA Vaccine to Protect Against Scrub Typhus.
Monica Mowrery

Detection of Black Band Coral Disease Using DNA Sequencing and PCR.
Nishanth Parameswara

Measuring the Effects of Drugs Targeting the Met Receptor Kinase in Tumor Tissue .
Joseph Riley

Room 127

Printing Endothelial Cells to Form a Vascular Network.
Perisa Ruhi

Investigation of Hippocampal Area CA1 Involvement in Spatial Navigation Using Genetic-Based Neuronal Silencing.
Victoria Sadaat

Examination of Afferent Ventral Tegmental Area Dopaminergic and GABAergic Fibers in the medial Prefrontal Cortex of Healthy Mice.
Sneha Shah

Chemical Analysis
Room 103

Synthesis of Polylactic Acid by an Organic Catalyst.
Tyler Brobst, Adam Christian, and Jonny Coleman

Room 103 (continued)

Synthesis & Analysis of Biodiesel Derived from Vegetable Oil.
Ellen Huang and Jason Kaushik

Application of Quantum Dots as pH-Sensitive Probes.
David Klayton and Daniel Markwalter

Determining Effect of Degradation on Antioxidant Activity.
Blair Hu and Steven Tan

Room 129

Optimal Synthesis & Solubility of β-Cyclodextrin-Ferrocene Inclusion Complexes.
Brett Evans and Sam Pell

Construction & Application of Portable, Programmable Potentiostat.
Steve Jakiel and Justin Wang

Synthesis & Biodegradation of Starch/Polylactic Acid Blends.
Lexi Moutafakis and David Wang

Communication Systems
Room 111

The Effects of Conformity to a Harmonic Series of Perception of Pitch Structures.
Brett Anders, Matt Chamberlain

Investigation of Audio and Video Compression in Pod Casts.
Yoomin Ahn, Ji Eun Kim

A Study of Microphone Placement with Respect to Different Genres.
Alex Pham, Alex Khumerts

Examining the Benefits of Video Technology towards Trigonometry Instruction.
Noah Kim, Anthony Hwang

Computer Aided Design
Room 128

Sports Car Design.
Brian Lee

Senior Research & Mentorship Presentations continued

Room 128 (continued)

Redesigning A School Using Alternative Materials.
Ashley Afraine-Sakyi

Design of a Boathouse.
Rebecca Cohn

Design of a Solar-Powered Motorcycle.
Tim Baik

Room 104

Design Study of Verticle Axis Wind Turbines for low-yield implementation in urban areas.
Hilmi Entabi

Harvesting Mass Energy Using High Altitude Wind Power and Its Implementation on Common House Structures.
Edwin Ju

Human-Powered Gymnasium.
Greg Romais

Design of an Orthodontic Bracket.
Clara Bergeron

Computer Systems
Room 115A

Automating Scoliosis Analysis.
Amar Sahai

Computer Vision.
Hugo Woolf

Reverse Engineering Graphs: Obtaining Data Points from Scatterplot.
Maya Wei

Data Compression through Duplicate Elimination and Tagging.
Jeffrey Thomas

Room 115A (continued)

Parallel Computing with MPI.
Mark Snyder

Automated Musical Part Writing.
Kevin Deisz

Designing a Music Scripting Language.
Casey Mihaloew

Room 115B

Rigid Body Dynamics: A Graphical Simulation.
Eugene Paik

Exploration of a 3D World.
Zachary Greer

Automated System Testing.
Ian Garrett

tjTalk School Question Forum.
Filip Sufitchi

Design and Implementation of an Extensible, Modular, Web-based Classroom Supplement.
Andrew Hamilton

Library

Math Edutainment Software for Girls Grades 1-6.
Emily Clarke

Benefits of Computer Education.
Jessica Gorman

Learning to Design Simple Computer Programming Projects in an Elementary School Setting.
Crystal Noel

Computer Science for the Young Mind.
Paul Im

Energy Systems
Room 119

Investigation and Production of Efficient and Cost Effective Alternatives to Diesel Fuel.
Ainsley Faux

Senior Research & Mentorship Presentations continued

Room 119 (continued)

Comparative Analysis of Filtration Methodology for Waste Vegetable Oil Derived Fuels.
Collin Schweiker

The Design and Prototyping of a Self Sustaining Vertical Farm.
Samantha Sharp

The Design and Construction of a High Efficiency Car Body for a Solar Powered Vehicle.
Caitlyn Campbell

The Design and Implementation of the Aerodynamically Stable Attachment of a Solar Car Body to the Frame.
Sarah Catlow

The Design and Construction of an Efficient Primary Structure for a Solar Powered Vehicle.
Nolan Pollack

Energy Systems/Prototyping
Room 117 or 119

The Conversion of a Tethered Underwater ROV to a Wirelessly Controlled ROV.
Peter Noone

Design of an Underwater Remotely Operated Vehicle.
Adam Cho, Sarah Choi, Natalia Czapski, Karen Morrison, Nelson Zhu

Development of a Biomimetic Manta Ray ROV.
Becky Moye

Microelectronics
Room 118

Refinement of a Laser Pavement-Profiling Process.
Dan Keramat

Room 118 (continued)

Improvement of HOG-Based Classification.
Michael Kramer

Development of RFID-Assisted Pedestrian Dead-Reckoning Navigation
Matt Green

Neuroscience
Room 102

Mind-Controlled Wheelchair.
Lauren Groskaufmanis, Lisa Pang, Kathleen Ryan, Natalile Villacorta

Obtaining Action Potentials in the Medicinal Leech.
Ellie Clougherty, Alex Nguyen, Eva Szymanski

Computational Techniques for EEG Data-Noise Reduction and Signal Source Identification.
Aditya Palepu

Oceanography and Geophysical Science
Planetarium

Study of Concentration of Atrazine & Its Transformation Products.
So Jung Youn

Characterization of Proteins in Barnacle Cement of Balanus amprhirite.
Arianna Geneson

Room 130

The effect of summer temperatures on Dermo disease in oysters.
Ilona Fleisher

Analysis of Potamac River Water Quality Using Bioluminescence.
Brian Schwenk

Effect of Changes in Environmental Conditions on Covering Material Preference.
Lillian Waller

The Effect of Sea Grass, Floating Macro Algae & Oyster Reefs Habitats.
Erica Kuehn

Senior Research & Mentorship Presentations continued

Optics and Modern Physics
Room 101

Analyzing the Performance of a Light Field Camera.
Ved Basu

Investigation of Power Fluctuations in Liquid Crystals.
Lucas Carreno

Thermally Induced Nonlinear Refractive Index of Silica Glass, Physics.
Kee Young Yee

Effect of Temperature on Propagation of Optical Vortices.
Nicholas Ryals

Room 222

Using Mathematica to Manipulate Spatial Hearing.
Rebecca Fielding and Aobheann Thinnes

Acoustically Enhancing Sound Quality in TJ Auditorium.
Samuel Griffis

Study of Sonic Crystal Depth on Transmission Coefficient.
Christina Ko

Measure of Sound Vibrations with Michelson Interferometer.
Colin Maloney and Alexander Witko

Prototyping
Room 117

Modification of a Diesel Fueled Vehicle to Run Exclusively on Vegetable Oil.
Mike Ross

Room 117 (continued)

Design and Implementation of a Modular Frame into a Solar Car and the Integration of all Relevant Subsystems.
Andrew Hong

Design and Implementation of a Regenerative Braking System in a Solar Vehicle.
Jeannette Miranda

Design and Implementation of a Roll Cage in a Solar Powered Car.
Sam Burdett

Robotics
Room 116

The Design of an Automated Robotic Robotic Foosball Table.
James Heard

The Design and Construction of a Remote Controlled Fire Extinguisher.
Jacob McAuliffe

Design and Implementation of an RFIenabled System to Track Inventory and Optimize Hospital Resources.
Kevin Nava

Design and Implementation of a Dashboard User Interface and Data Handling for a Solar Powered Automobile.
Matthew Becker

CHUM presentations

Steroids.
Baldwin, Kelly Rogers, Mitchell Smith, Ester Yang

Concrete.
Jamie Kim, Jee In Seo, Matthew Spain

Opium.
Joowan Choi, Evan Liu, Drew Spears, Crystal Yi

Steel.
Miles Cook, Brad Stalcup, Katherine Wang

E
1:35 p.m.- 2:45 p.m.

IBET presentations

Room 120

To Drop or Not to Drop.
Dave Wyman, James Graham, Tania Ermak, and Jungmin Park

Oh Salamander Eggs, Where Art Thou?
Caroline Woods, Sheila Kaushik, Soo Jin Kim, and Derek Eliasen

Several Slimy Daphnia Sailed the Seven Salty Saltcellars!
Chantelle Ekanem, Samuel Luo, Daniel Mares, and Srishti Shrivastava

Rays May Increase the Days.
Abhishek Cauligi and Ju Young Lee

Room 121

Turmeric Time III.
Thomas DeAnda

Could Global Warming Affect Our Food Supply?
James Bradbury, Alice Ju, and Allen Shi

That's Shocking!
Gina Hansen, Skyler Anderson, Austin Donohue, and Vicky Kelley

Gotta Poke 'Em All.
Kate DeWeese, Brandon Yi, and Joe DuBois

Room 123

Growing Green.
Leif Bakke, Elaine Chen, Kwan Lee, and Alec Powell

Sizzlin', Settlin' Spotted Salamanders.
Ananth Sridhar, Amelia Dahl, Sarah Nielsen, and Yasmine McBride

Salamanders of the Deep.
Omeed Maghzian, Andrew Hua, and George Deng

Drugs and Bugs.
Cassandra Leong, Jacqueline Pinderski, Collin Jones, and Sydney Ulrich-Dogonniuck

Room 125

Turmeric Time II.
Derek Lai

I Would Like to Make a Deposit.
Fareez Chowdhury, Stephanie Pitts, Ellen Howerton, and Stephen Yuan

Sweet and Sour Eggs to Go.
Carson Hotard, Dane Wittig, Kerry Zhang, and Timothy Yeh

Sleeping Beauties.
Mary Sun, Shawn Tsutsui, Anna Hicks, and Jenny Park

Room 131

To Beat or Not to Beat?
Nicole Gonzalez and Carleigh Stiehm

An Edge on Your Deposit.
Billy Rieger, Owen Nugent, William Qian, and Quentin Moore

Should You Live on a Farm?
Ricky Prasannappa, Samy Singh, Eric Li, and Kristen Skowronski

Room T5

Check Yes, Daphnia, Are You Beating?!
Catherine Ayres, Colleen Maher, Ria Sarkar, and Katherine Sheridan

Coocoo for Cocopods.
Connor Brinton, Pranava Raparla, Chris Rom, and Daniel Shanker

Oh My, Egg Masses!
Adrienne Ivey, Helen Li, and Nancy Wang

Hyperactive Turbellarians.
Jahnnavi Madiraju, Lizaveta Miadzvedskaya, Jacqueline Speiser, and Sarah Springmann

Room T6

pHiltering.
Daphne Fong, Jay Li, Daniel Perkes, and Julie Vrabel

What's Worse for the Environment, Cars or Factories?
Chris Groskaufmanis, Halen Lai, Ben Le, and Mashal Wakilpoor

Don't Lase Me Bro!
Sam Girvin, Nathan LaPierre, Eddie Lichter, and Sam Sohn

IBET presentations continued

Room T6 (continued)

Shocking Daphnia Secrets.
Mike Taylor, Seema Mir, Ashish Mathews, and Eileen Liu

Room T7

Breathe Deep,
Egeria Densa. Matt Baron, Brent Baumgartner, Connie Huang, and Madison Russell

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Senior Research & Mentorship Presentations

Biotechnology
Room 113

The Effects of dsRNA Concentration on RNAi in Mammalian .
Michael Chang

A Comparison of the Allergenic Properties of the 14-16 kDa Proteins Found in Rice Species Oryza sativa and Oryza glaberrima.
Meghan Clark and Vivian Cooper

Anti-Cancer Potential and Storage Viability of Hyaluronic Acid/TNF-related Apoptosis Inducing Ligand Complex.
Joshua Hahm and Asher Rubin

The Effect of Cdc-2 Proteins on Mitosis in Mouse Neuronal Tissue.
Michael Jiang

Room 114

Evaluation of the Effectiveness of Luciferase Genes from Various Sources in Increasing Bioluminescent Properties.
Owen Im

The Effects of UV Radiation on the Extent of Mutation in Genes Expressed in Human Epithelial Cells.
Joseph Muldoon and Claire Wenger

Room 114 (continued)

Using Dark Anaerobic Fermentation to Turn Waste Into Energy (Microbial Fuel Cell).
Neesha Schnepf

Analysis of the Dissolution of Boswellia Serrata Resin in Dimethyl Sulfoxide and a Simulated Stomach Environment Using Chromatography.
Jessica Shartouny

The Effect of T4 Endonuclease V on Basal Cell.
Camille Vu

Room 127

Genetic Divergence Between Magnolia virginiana and Magnolia grandiflora.
Athena Tellis

Analyzing Calcium Efflux Signaling in Terms of Neural Stem Cell Lineages in vitro .
Brinda Gupta, Daniel Holohan, Meghan Nelson

Using Tandem Mass Spectrometry to Determine Reference Steroid Levels for Children.
Hirsch Sharma

Exploration of Battlefield-like Stress on the Human Immune Response of Ranger Training Battalion Cadets using Pan-omic Computational Approaches to Find Molecular Markers and Regulatory Networks.
Tilani Lowman

Developing Internal Architecture of [Unspecified] Public Cancer Institute.
Alexis Barrett

Room 143

The Effect of Bitter Melon *(Momordica charantia)* Extract on DNA Damage Sustained by Irradiated Cultures of *Eschericia coli* Bacteria.
Shipra Maheshwari and Anthony Tran

Optimization of Transformation Efficiency in Various *Escherichia coli* Strains Using Three Trasformation Methods.
Jonathan Pan and David Wu

Senior Research & Mentorship Presentations continued

Room 143 (continued)

Statistically Siignificant Differences in Milk Composition Owing to Alternative Milk Production Methods.
Karthik Ravishankar

Differences in Lifespan of Caenorhabditis elegans (AB1-Strain) Owing to Various Exposures to Ultraviolet Radiation

The Carcinogenic Inhibitory Activity of Genistein (an Isoflavone) Against Rat Adenocarcino Cells.
Swati Teerdhala

Chemical Analysis
Room 103

Hydrogen Complexation Students in Crown Ethers.
Maneeshika Madduri

Synthesis of Fluorescent Voltage-Gated Sodium.
Marc Lipman

Environmental Detection of Acinetobacter baumannii.
Jackson Prestwood

Room 129

Quantitative Application of Fecal Sterols as Indicators.
Min Jung (Stella) Kim

NMR Spectroscopy of Molecules with Very Large Quadrupoles.
Apurva Sisodia

Communications Systems
Room 111

The Number of Youtube Views as an Indicator of Audience Interest in the Subject.
Zoe Renfro, Owen Cyr

Room 111 (continued)

The Effect of Background Sound on Viewer Memory.
Kelly Kirschner, Joey Regalbuto, Sarah Schmoltner

Design and Implementation of an Affordable Steady-Cam.
Zach Batts, Laura Barnes, Jeff Siebach

Determining the Factors that Produce the Most Effective Green Screen.
Diane Nguyen

Room 128

Sustainable Architecture.
Ariel Coronel

Design of an Edible Landscape.
Cynthia Schwab

Design of a Dance Complex.
Irene Tai

Design of a Green Restaurant.
Vicki Lee

Computer Aided Design
Room 104

Automated Parking Garage.
Ricky Ries

Vertical Suburbia.
Wang Ting

Design of a Miniature Golf Course.
Katie Zettler

Educational Animations of the Palace at Knossos.
Sarah Seid

Underwater Research Laboratory.
Jennifer Fang

Computer Systems
Room 115B

Isolation of Individual Tracks from Polyphonic Music.
Nicholas Starr

Senior Research & Mentorship Presentations continued

Room 115B (continued)

Categorization of Music Through Fractal Analysis of Sound Waves, Fractal Dimension and Classification of Music.
Stephen Drodge

Creation of Algorithms and Software for Use With a "Foosbot."
Michael Meadows

Automation of Testing in the Distributed Common Ground System.
Michael Eng, Northrop Grumman Mission Systems

Evaluation and Comparison of Real-time Network Latency.
Phillip Marlow, Koolspan Inc.

Analysis and Presentation of Signal Jamming Effectiveness.
Brandon Vargo, Northrop Grumman Tasc

Energy Systems
Room 151

The Implementation and Testing of a Liquid Engine Cooling System for a Bio-Diesel Fuel Vehicle.
Amar Desai

The Design and Implementation of a Radiator and Airflow System for a Bio-Diesel Fuel Vehicle.
Mason Freedman

The Design and Implementation of an Appropriately Gear Ratio Differential Mechanism in a Bio-Diesel Fuel Vehicle.
Eugene Lee

The Design and Creation of a Hand-Held Stirling Engine Generator with Attached Parabolic Reflector.
Brian Murphy

Room 151 (continued)

The Design and Implementation of an Electrical Propulsion System for a Solar Powered Vehicle.
Spencer DeMars

The Design and Construction of a Sensor System to Monitor and Compile Telemetry Data for a Solar Powered Vehicle.
Junxiao Lu

The Design and Implementation of an Automated Speed Control System in a Solar-Powered Vehicle .
Ryan Stumvall

Neuroscience
Room 102

Disease Pathogenesis: Dopamine Interacts with α-Synuclein
Benjamin Bloom

Activation Differences During Ascending and Descending Trends in δ-Wave Power While Sleeping
Nathaniel Coddington

Proteomic Analysis of Mouse Microglial BV-2 Cells Treated with Valproic Acid
Spencer Frei

Effects of μ-Opioid Receptor Activation in the medical Subnucleus of the tractus solitarius (mNTS) on Gastric Motility
Ting-Yu Hu

Effect of EphA4 on Neuronal Morphology and Network Dynamics
Jessleen Kanwal

Paralytic Shellfish Toxin Distribution by Size and Depth in Offshore Gulf of Maine Waters
Vangie Shue

Senior Research & Mentorship Presentations continued

Oceanography and Geophysical Science
Planetarium

Hearing Ability of the Lined Seahorse.
Susan Hastings Meghan Kelly

Investigation of Commercially-Sold Fish Labeling.
Jacqueline Montgomery, Kelly Watson, Travis Triggs

Effect of the Type of Macro Algal Diet on Growth Rate of Haliotis rufescens.
Suzan Ok

Effect of Anenmone Fish on Anemone Growth.
Erica Curles

Optics ands Modern Physics
Room 101

Tracking Solar Material through Inner Heliosphere.
Kevin Casto

Using Adinkras to Compare 12+12 Complex Linear Multiplet.
Jared Hallett

Novel Approach to Multi-Thread Theory of Solar Coronal Loops.
David Kim

Innter K Shell Signatures of Iron in Warm Absorbers.
Christopher Olund

Room 222

Low-Cost Photon-Counting Camera Development.
Alex Krepetski

Design & Implementation of Speed-Management System in Automobiles.
Molly Patterson

Room 222 (continued)

Effect of Non-uniformity Corrections on Nighttime Infared.
Andrew Smith

Comparing Performance of Object Motion Tracking Algorithms.
Joseph Xu

Correlation Between Laboratory & Field Management of LED Signals.
Qihui Dolly Xu

Prototyping
Room 117

Design and Integration of a Suspension System into a Solar Powered Vehicle.
Robbie Tracy

The Design and Implementation of a Head-Up Displayt System in a Solar Vehicle.
Alex Shie

Designing and Implementing a Pittman arm steering System in a Solar Car.
Alex Spaulding

Design and Implementation of a Chassis for a Solar Powered Vehicle.
Kevin Zidalgo

Thank you to all of our star students, including those who have presented their research today!

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