Towards Autonomous Drones Guidance Using Computer Vision









UAV situational awareness

Depth camera: uses Intel Neural Compute Engine Transfer learning: utilizing YOLO network which will be trained using aerial images Cloud computing inference using Nvidia AGX Orin. Max FPS possible!

Students: Anthony Russo, Thomas Romeu, Haris Alam Faculty Mentor: Mohammed Alabsi



1. Identifying Psychological and Social Reasons for a Depressed Mood among Disadvantaged Mothers of Childbearing Age



2. Assessing the Climate of Inclusivity and Acceptance of Diversity at the School of Nursing Health and Exercise Science

Tamara Rene Invisibility & Teleportation

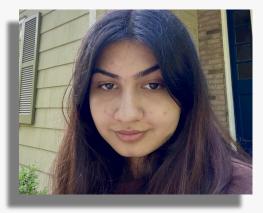
Starlin Regalado-Nunez Biokinesis & Telepathy

Rahshida Atkins, PhD, MSN, RN, APN-C Flight & Immortality

Technical title: Molecular simulations of biomolecular systems **Layperson title:** Researchers telling computers to tell atoms what to do











Zach Alseika Playing ukulele

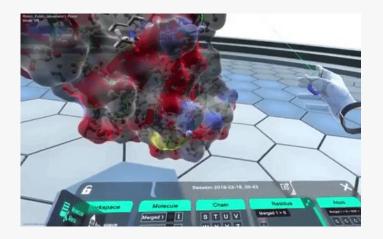
Noor Grewal Boating

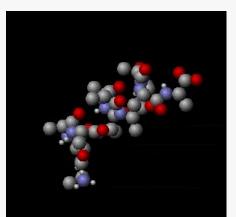
Vani Lorish Eating food **Ifrah Malik** Mind-reading

Cassi McDermott Eating food



Joe Baker (mentor) Simulating molecules, playing the violin





THE TRANSITION FROM INFERTILITY TO MOTHERHOOD







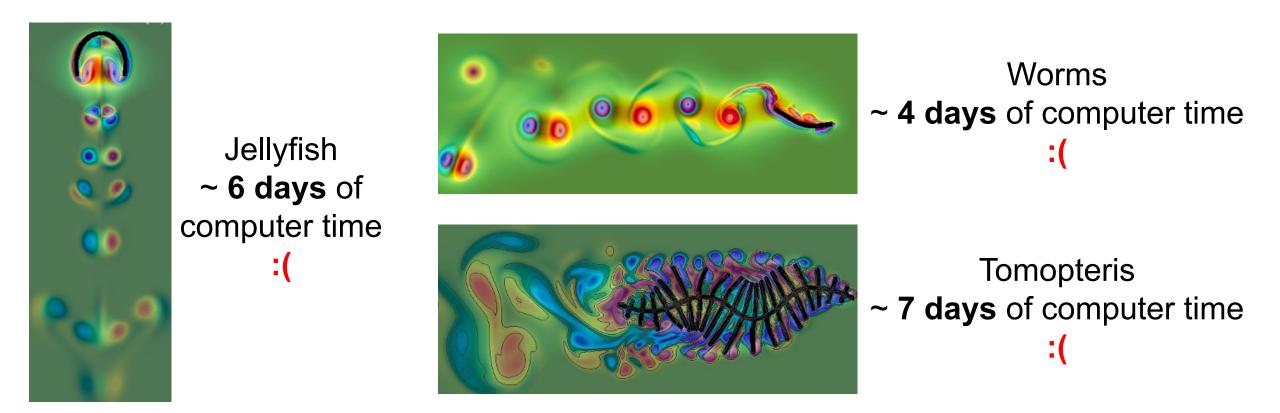
STUDENT: ELLIE KERHIN

FACULTY MENTOR: JESSICA BARNACK-TAVLARIS



Using fancy math to reduce computer simulation time by over 2,500%!

(MUSE Title: A polynomial chaos approach for predicting swimming performance)



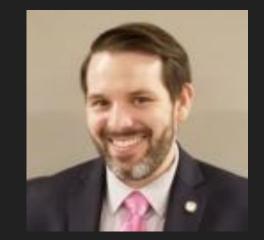
Anna Dorval, *Mathemagician* (rising 4th year Math major) Nick Battista, Nerd (Math & Stats faculty) Understanding Bond Degradation Between Fiber Reinforced Polymer (FRP) Strengthening and Concrete due to Freeze-Thaw Cycling

How Many Times can Iceman Freeze Adhesive-X?





Hayley Conway - rising Senior civil engineering major; glows



Dr. Andrew Bechtel Civil engineering Dept. Shovels well

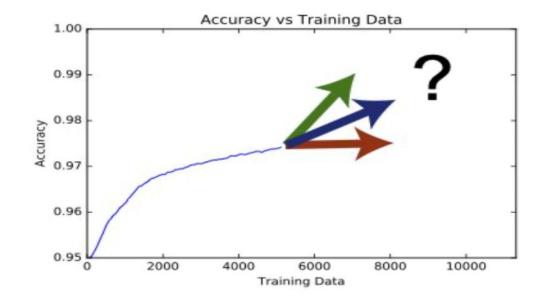
Curriculum Development in Support of Gallery Diversification

Featuring The Usual Suspects, work by Carrie Mae Weems

- MUSE 202

Megan Healey & Olivia Williams Dr. Carolina Blatt & Dr. Lois Fichner-Rathus

Forecasting Performance Changes of Natural Language Processing Systems during Active Learning



Robert Helck Humza Zaki Dr. Michael Bloodgood

JUSTICE & BLAMEWORTHINESS: PARENTAL DEMOGRAPHICS AND THE CRIMINALIZATION OF HOT CAR DEATHS



LOOK BEFORE YOU LOCK!

not a movie title (but good to remember if you have kids or pets in your car) #PasstheHotCarsAct

SUPER SOCIOLOGISTS?...

CAMERON KEATING: drafting long treatises in a single sitting **JORDAN EKSTROM:** adapting swiftly to new perspectives **DR. LIZ BORLAND**: making structure out of chaos

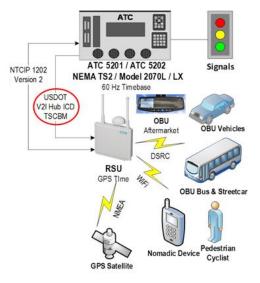


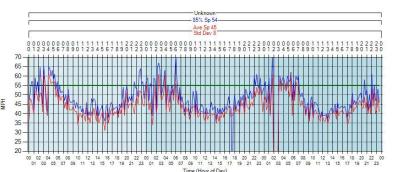
Pedestrian Performance Metrics Derived from Connected and Automated Vehicle Data



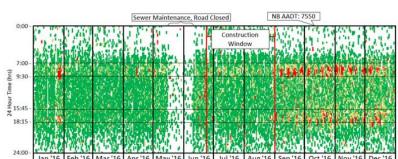
'How Well is Traffic Flowing?'

David Cardenas - Sophomore Christopher - Junior Alexa Karpus - Senior



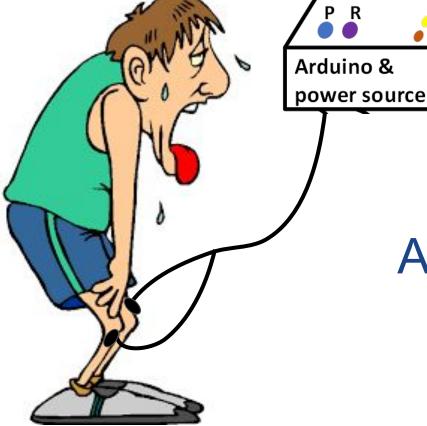


Tom Brennan, Prof. Civil



Design and Development of a Portable Muscle Fatigue Monitor

Are your muscles spent, or are you faking it?



Amanda Dias & Sebastian Winter

Brett F. BuSha

Effects of habitat degradation on songbird physiology and behavior

Are roads bad for birds?

Isaac Gutierrez: flight Luke Butler: telekinesis



STUDENI

Culturally cognizant literacy education in a globalizing world.

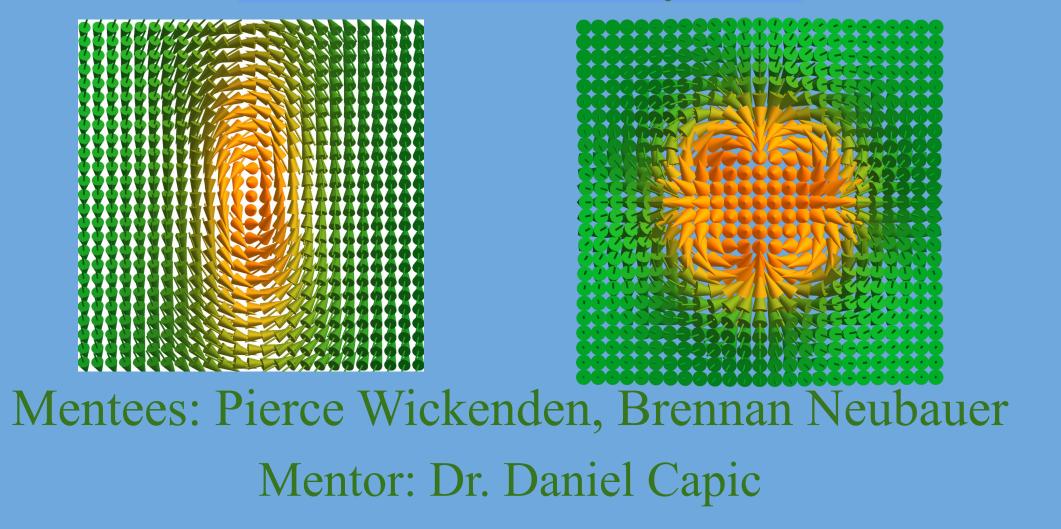
LINGUISTIC AND CULTURAL DIVERSITY AS A CLASSROOM RESOURCE

Teresa Folan Superpowers include bilingualism and biculturalism

Dr. David Bwire

Superpowers include multilingualism and multiculturalism

Exotic Topological States in Magnetic Systems: Higher Order and Deformed Skyrmions



Studies of Honeysuckle Morphology, Genomics & Herbivory

The Honeysuckle Collective presents: HONEYSUCKLE ODYSSEY: THE ADVENTURES OF UNDERSTANDING THE POWER AND DIVERSITY OF HONEYSUCKLES ACROSS THE PLANET!







Anna

Making my lab laugh



Robby

Getting up Early



Siya

Star Wars

Encyclopedia



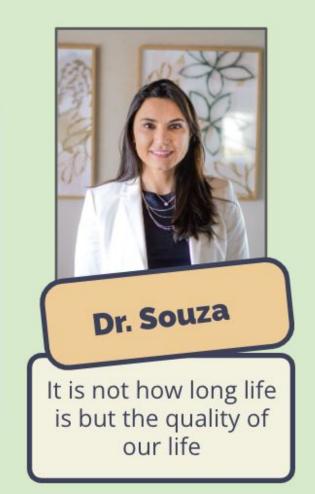
Dr. Clement

Plant Whisperer



Project Title: "Health Education as A Strategy To Enhance The Quality Of Life Of Older Adults, Their Families And Caregivers Affected By Covid-19 In Trenton Area, NJ"

> **Title for Layperson**: Improving Life-Quality of Older Adults





Exploring Barnacle Exoskeleton Development and Materials Properties as a Function of Growth Environment

Oľ Metamorphosis: Swimming bug to super shell Phylicia Menendez Angela Mo Raegan Gautam **Kirthana Krishnamurthy** Dr. Gary Dickinson

Technical title: Designing a Mass Spectrometric Assay to Detect Ytfe Adducts from a Chelator Fragment Library **Layperson title:** Finding Something that Sticks to this Protein











Cristian Herrera Alpizar

23+49, competitive swimming.

Understanding calculus but

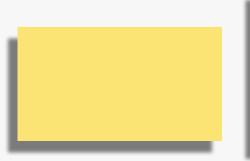
needing a calculator for

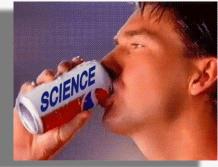
Coco Peddinti Winning at air hockey, karaoke, getting out of escape rooms.



Justin Martinez Picking things up and putting them back down (weightlifting), rambling about random science topics.

Levi Ekanger (mentor) Guessing who reviewed a manuscript, rollerblading over small sticks and stones without falling.

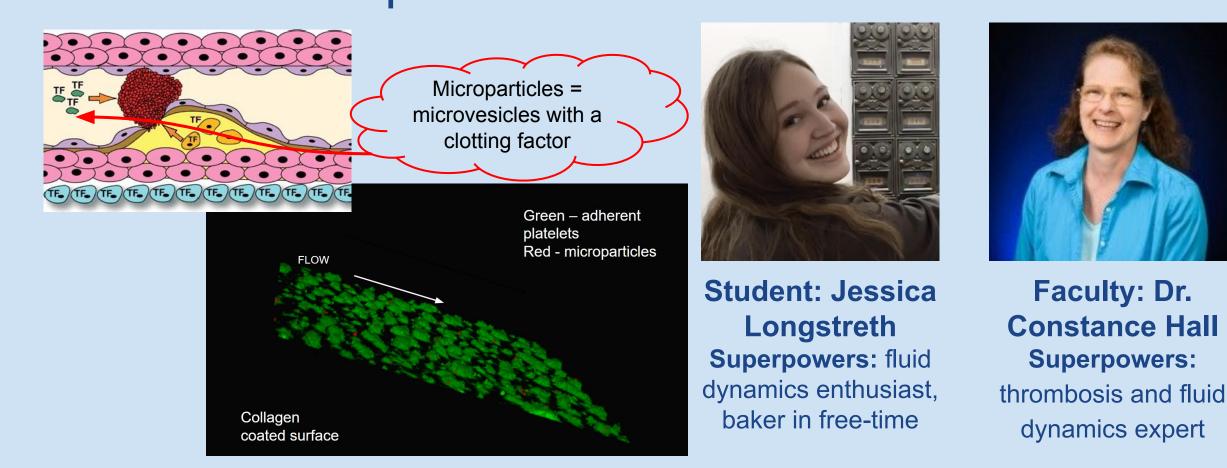






EMILY BEHNKE: Excellent at picking Tupperware for leftovers!
OMAR HALIM: Able to lift heavy weights & decode entire genomes!
SEAN SINISCALCO: Remembers insanely specific but utterly irrelevant things!
DR. K.T. ELLIOTT: Pipettes at the speed of lightning!

Monocyte-derived Microparticles in Thrombosis in other words... How do Microparticles Contribute to Blood Clots?



Virus-inspired transfection of a marine alga: plasmid DNA within a viral envelope (A sheep in wolf's clothing: helpful genes wrapped in a virus coat)



https://en.wikipedia.org/wiki/File.' irus_cocco_2.jpg



Beth Can solve a Rubik's cube!



Meghna Can binge any sitcom in no time! Samielle I can make desserts disappearl



Dr. Hirsh Cooks a perfect hard-boiled egg!

]] Illustrator Unknown and presumed eaten

https://capeodd.com/sheep-wolfs-clothing/

Climate Change and its impact On Water Resources Engineering



Isabella Lamboy, rising junior civil engineering John McElroy, rising junior civil engineering

Michael Horst, Associate Professor of Civil Engineering



José de León González Slightly stretchier than average skin Enhancing the Sensitivity & Selectivity of a 3D Sensor for Direct Nitric Oxide Detection from Cultured Cells (Sensors for Cellular Espionage)





Nikolas Romano Holds the world record for Fastest Time To Eat Three Rice Krispies Treats

Angela Thomas professional victim of gravity

Dr. Rebecca Hunter (mentor) *instrument whisperer, unintentional memorizer of random song lyrics and other useless information*

Well siblings of a child newly diagnosed with type 1 diabetes: The sibling's perception



How does the sibling view the diagnosis and how does it holistically affect the individual?

— Student: Sarah Curtis

Faculty: Dr. Tami Jakubowski -



My superpower: listening

Research on Aging Adults with Autism (RAAD)

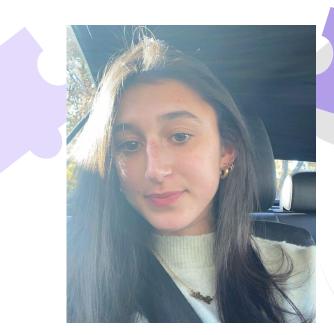
Focussing on how to manage/prevent osteoporosis development in this population specifically through dietary methods.



Missy Casper



Dr. Kartoz



Sofia Abbruzzesi

Miniaturization of Microstrip Antennas for 5G Communications and IoT Applications



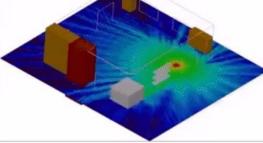
DR. KHAN Super Power: Horse Riding, Biking, Kayaking

Layperson Title: Improving Antennas for 5G Communications and IoT Applications











BENJAMIN WINKLER Super Power: 1 can freeze the time!!



NICHOLAS ALVEAR Fun fact: Length of Africa is longer than the diameter of Mercury!!



TALHA MURAD Super Power: I can emit and receive radio waves!!

Development of Stabilization and Speech Recognition Algorithms using Nao Robots



Team 1 (Rising Juniors) Samantha Potomic² and Jack Marble²

Team 2 (Rising Sophomores) Rebecca Kimmick¹ and Shawn Kushner²

Faculty Mentor: Dr. Seung Kim

Dept. of Electrical¹ and Computer² Engineering

Voices of Asian American Teachers: Exploring Intersections of Racial and Professional Identities through Phenomenological Interviews aka

"What do Asian American Teachers have to say about their lives and teaching?"



Rachel Lee (Superpower: Teleportation)

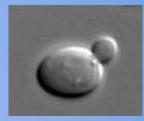
Dr. MinSoo Kim-Bossard (Superpower: Empathy)



Technical Title: A Novel Connection Between [*PSI*⁺] Prion Formation

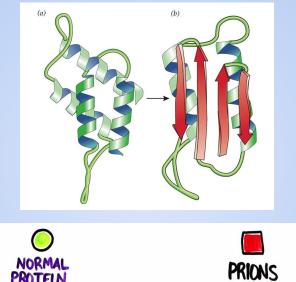


and RNA Splicing in *Saccharomyces cerevisiae* Marvel Title: Do shape-shifting proteins aid yeast survival??





Student: Audrey Riccitelli Super powers: pouring plates; super-artist; EMT (savior of the people!)





Faculty: Dr. Tracy Kress
Super powers: yeast "frogging";
traveling; geeking out to Stranger Things

Multiwavelength Census of Active Supermassive Black Holes In Shocked Post-Starburst Galaxies

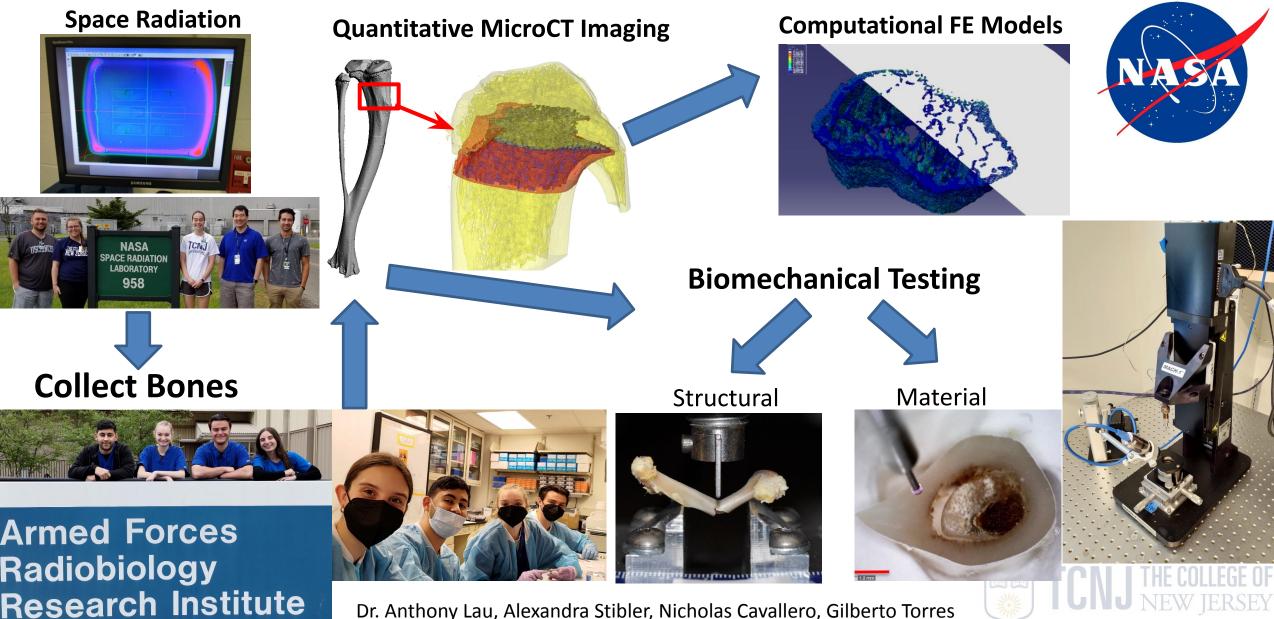
Layperson Title: Black hole brightness in galaxies that "just"¹ stopped forming stars using telescopes

Students: Amanda Graessle, Louis Miller, and Dean Klunk Faculty Mentor: Dr. Lauranne Lanz

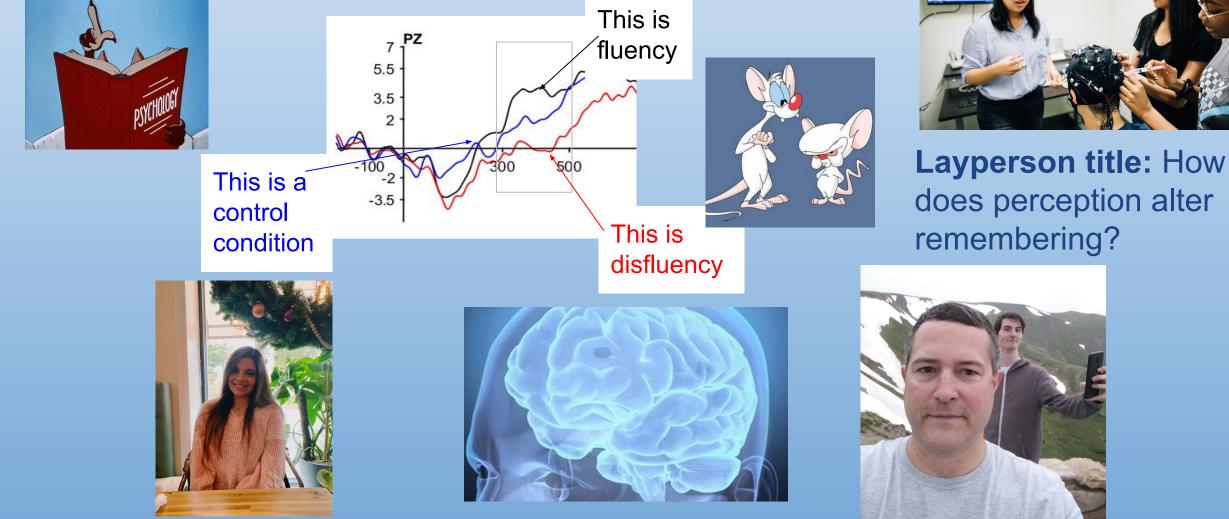
> ¹ Recently, astronomicall speaking, means in the last billion years!

The College of New Jersey

Effects of Space Radiation Exposure on Bone Strength



Official Title: Neural Measures of Fluency and Disfluency During Recognition Memory



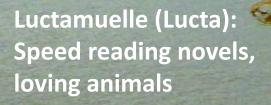


Faculty Mentor: Andy Leynes

FAOMeT Gene Expression in Carcinus maenas in Response To Salinity Changes

Layperson Title: How crabs regulate salt levels in their blood when salinity in seawater changes.





Rachel Lea: Smiling, Baking

Kiandry Minaya: Going to the gym, socializing



Don Lovett: Photography, cooking

Searching for life on Tatooines, around black holes, and in closely-packed solar systems *Characterizing the orbits, atmospheres, and*

habitability of dynamically unique exoplanets

Skylar D'angiolillo *exoplanet* atmospheres Ashley Fernandez: *compact planet orbits* Michael Pedowitz: *circumbinary planets* Mike Polania: *black hole planets*

> Faculty mentor: Dr. Mariah MacDonald

Pathways to Reentry: Examining Perspectives of Returning Citizens Navigating Life After Prison

What are the experiences of individuals returning from prison in New Jersey in their own words?

Faculty Mentor: Dr. Michael B. Mitchell, Superpower: "Human food disposal"

Student Collaborator #1: Angie Tamayo-Leon, Superpower: "Chancla shooter"

Student Collaborator #2: Irvin Echeverria, Superpower: "Heightened recall"



Delaware River

Handmade Paper | Video | Sound | Installation

Student Collaborators Liz Stahl and Brianna Titus

Faculty Mentor Elizabeth Mackie

Developing sustainable approaches to fuels and chemicals

MUSE title: Developing Improved Ruthenium and Palladium Catalysts to Degrade Plastics



Angelica Bolon Rising junior Chemistry Major MUSE Positivity and Modesty



Team Plastics Recycling



Yaa Serwaa Awuah Rising sophomore Chemistry Major MUSE Resilient Iron Catalysts for CO₂ Reduction Team CO₂



Alyssa Minnella Rising senior Chemistry Major Making people smile



Abby O'Connor mentor Chef extraordinaire



Sai Dhulipala

Rising Junior

Strength and

MUSE

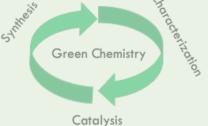
Tenacity

Chemistry Major



Mubarak Rawe Rising sophomore Chemistry Major Sherman Fairchild Translating French

Catalyzing reactions since 2010



Children of the Midnight Sun: The Hip Hop Saga















Cesar Gonzalez: The Legendary Iron Fist, Son of K'un - Lun





Participant	Super power
Yehuda Binik	Heat vision (can use laser pointer)
Faiza Hoque	Telekinesis (asks politely to bring her something)
Dimitris Papamichail	Mind reading (knows when students are bored during lecture)

PROJECT AND LEARNING PLAN FOR VISUALIZING ACROSS BOUNDARIES

MARVEL UNIVERSE: WAKANDA

DR. KIM PEARSON AS QUEEN RAMONDA Faith Christian as Shuri

Escape from Nursing 220

Dr. Tracy Perron PhD, RN (Super Power: Case Study Developer) & Morgan Vaccaro (Super Power: Escapologists)



Juggling with more than two particles: Biomimetic studies of multi electron-proton transfers.

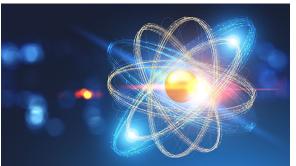
Saptarshi Dutta (Coolest Transition Glasses)

Tanay Parnaik (Does Chemistry with Style)

Gio Parada (Can't Juggle but sings in the lab)



Probing Secondary Student Attitudes About Physics



or...



Why do students hate physics so dang much?

Student: Joey "The Tinkerer" Sabatino





Mentor: AJ "The Setup Man" Richards

Official Title: Toward Understanding of Virtual Reality Sickness in Children

Layperson Title: Does children get sick in VR?



Students: Paula Arroyave Elliot Topper Andrew Michael



Faculty Mentor: Sharif Mohammad Shahnewaz Ferdous

Examining the role of CYP72 enzymes in maize and Arabidopsis biochemical and growth responses to environmental stress

OR

How do CYP72s modify plant growth and biochemistry in response to stress?

Ellie Kreider: adept transplanter, Mrs. Maize Shreya Ranadive: gel sculptor MaryAngela Senter: PCR master, super cool

Leeann Thornton: biochemist, plant wrangler, gene investigator, mentor



Can individual responses to environmental variation contribute to the formation of new species?

-0*r*-

Can differences in how you grow up help cause new species to form?

- Neel Patel Superhuman Sleeping
- Sathya Rameshkumar Superhuman Problem-solving



Matt Wund – Superhuman Punctuality





Identification and characterization of regulatory genes of corn (Zea mays) defense responses or simply:

The search for maize defense genes



Dr. Woldemariam



Kruti Patel



Ryan Pagnilo

A Data Visualization Experience for Preservice Teachers (ADVizE): Analyzing Undergraduate Data

Analyzing Data from an Undergraduate Workshop Series Focused on Data Visualization







Druscilla Kojiem Super power(s):

- Super Big Appetite
- Super Big Heart
- Super Talkative