PHYSICAL SCIENCE

Undergraduate

Title: A Theoretical Investigation Of Chlorofluorocarbons	**Presentation ID: A94 – AN**
Author: Arlene Alvarado	**Discipline:** Physical Science
Campus: Texas A&M University	**Student Level:** Undergraduate
Co-Authors:	**Mentor(s):** Dr. Kameron R. Jorgensen, Ph.D.

Abstract
The photolysis of Chlorofluorocarbons (CFCs) by UV radiation leads to a catalytic chain reaction that causes the destruction of ozone (O3). Calculated thermodynamic properties such as bond dissociation energies and atmospheric interaction energies have been used in designing alternatives for CFCs and predicting the thermodynamic degradation process. Bond dissociation energies of CFCs and Hydro-CFCs are determined using computational methods (i.e., B3LYP/cc-pVTZ, G4, G3, and ccCA). Comparisons between theoretical and experimental values will be discussed.

Title: Eft	**Presentation ID: A95 – AN**
Author: Melissa Cadena	**Discipline:** Physical Science
Campus: Texas A&M University International	**Student Level:** Undergraduate
Co-Authors:	**Mentor(s):** Dr. Cox

Abstract
Bromine halocarbons are common in industry being found in flame retardants, marine aerosols, and pesticides. Once bromine halocarbons reach the stratosphere they are broken down by ultraviolet light, forming bromine radicals. These bromine radicals act as a catalyst for the destruction of ozone (O3). Accurate thermochemical properties for bromine halocarbons are necessary in order to find alternatives for these compounds and investigate proper scrubbing technologies. Herein, several computational approaches (i.e., G3, G4, ccCA, and CCSD(T)/cc-pVnZ (n=D, T, Q)) have been utilized to calculate the enthalpies of formation for brominated methane, ethane, ethylene, and acetylene derivatives. Enthalpies of formation are compared to experimental values and computational method comparisons are made.

Title: Crashworthiness Of Uavs And Methods Of Improvement	**Presentation ID: A96 – AN**
Author: Andres Carrillo	**Discipline:** Physical Science
Campus: Texas A&M University – Kingsville	**Student Level:** Undergraduate
Co-Authors:	**Mentor(s):** Selahatiion Ozcelik and Abinav Mukhergel

Abstract
Given popularity of Unmanned Aerial Vehicles (UAVs) referred to as drones, in the civilian market the demand for innovation is increasing at a high rate for the hobby drone industry. However instances occur during operation when they happen to crash leaving severe damages to expensive and vital equipment such as microcontrollers, cameras, and batteries. Research regarding crashes will provide different methods that are proven more efficient in crash protection systems for future use in drone designs. A hypothesis was brought to question regarding the topic of drones and their effectiveness of crash worthiness. By designing an attaching structure composed of

engineering material, thermoplastics, non-newtonian fluids, or polymer composite materials, to specified positions on a drone will thus reduce the effect of destroying vital and expensive equipment inside during a crash. The study compared prior research involving high velocity impact resis tance, and shock absorption using engineering materials in CAD software to simulate collision scenarios in order to design an alternate more effective method to protect drones when crashing. Materials such as ABS Plastic, PVC, PLA Resin, CPVC, Natural Rubber, PVC Rigid, and Polyester Resin went through simulations applying a different force ranges up to 30-N to study the effects of the force exerted on the material. Data analysis revealed that ABS Plastic and PVC Rigid stress, displacement, and strain simulation values behaved similarly high suggesting a composite material of the two would be sufficient for crash protection. Current ongoing further research could potentially show numerous variations of composite materials.

Title: Characterization Of Cold Plasma Film Deposition In A Reaction Chamber	**Presentation ID: A97 – AN**
Author: Kendal Ezell	**Discipline:** Physical Science
Campus: Texas A&M University	**Student Level:** Undergraduate
Co-Authors: Landon Nash	**Mentor(s):** Dr. Duncan J. Maitland

Abstract
Cold plasma treatments are useful for changing the surface chemistry of materials while preserving bulk chemistry. Characterizing the plasma field for each unique system is important for regulating experimental variables and determining bulk treatment consistency as it pertains to high throughput manufacturing. This study focused on mapping the plasma field of an Aurora 0350 Plasma Surface Treatment System and documenting the effects of sample fixturing and bulk treatment shielding. Silicon wafers placed in a grid were treated with plasma in two configurations: directly contacting the shelf, and while elevated into the plasma field on glass cuvettes. Shielding and bulk treatment viability were analyzed using elevated silicon wafers placed in grids on four shelves. Plasma film thickness, analyzed using spectroscopic ellipsometry, was assumed to correlate directly to the reactivity of the plasma field at that location. Increases in film deposition were seen with raised samples and when samples were placed towards the back of the reaction chamber. Decreased film deposition was observed around the entire periphery of the chamber. These inconsistencies in the plasma field must be considered for bulk treatments. The characterization of the plasma chamber found in this study can be used as benchmarks for future studies.

Title: N-Body Simulation Of Binary Star Mass Transfer	**Presentation ID: A98 – AN**
Author: Baylor Fain	**Discipline:** Physical Science
Campus: Tarleton State University	**Student Level:** Undergraduate
Co-Authors: Edward Smith Jr. and Taylor Hutyra	**Mentor(s):** Dr. Wyatt and Dr. Godeyra

Abstract
This study simulated close contact binary star systems with an N-body model using the discrete element method (DEM). NVIDIA-brand GPUs, with optimized CUDA architecture, were used for the simulations to utilize parallel programming. Binary stars have been studied for the past 200 years. Using Kepler's laws, binary stars provide a method to measure the mass of star systems and thus most of the galaxy. However, the mass transfer between stars in a contact system is hard to observe and is not deeply studied. DEM uses a non-continuum, non-approximating mathematical approach to simulations that are intuitive and easy to understand. This study will attempt to bring this field to more researchers by using a much simpler, yet still accurate approach, at modeling contact binary systems. The current results have shown to visually match theoretical and observed models of mass transfer.

Title: Horizontal Violence In Nursing		**Presentation ID: A99 – AN**
Author: Lorisa Gallardo	**Discipline:** Physical Science	
Campus: Texas A&M University – Corpus Christi	**Student Level:** Undergraduate	
Co-Authors:	**Mentor(s):** Cathy Miller	

Abstract
Horizontal or lateral violence is considered an act of hostility among nursing professionals. These behaviors can include gossip, innuendo, scapegoating, passive-aggressiveness, sabotage, and physical violence. The consequences of horizontal violence and avoidance of confrontation can have detrimental effects on employee satisfaction, increased turnover, resentment and adverse psychological and physical health outcomes in nurses. Unresolved conflict can lead to reducing the quality of patient care, increasing patient errors and result in increased risk for poor health outcomes for the patients in the nurse's care. Programs can be integrated that can provide opportunities for increased support and resources. The promise of positive behavior changes with the help of administration are factors that can lead to successful adoption and application of lateral violence policies. In a profession based on caring, it is incumbent on professional nurses to contribute to the safety and well-being of other nurse colleagues.

Title: Extended Geology Trips With Special Emphasis On Study Abroad		**Presentation ID: A100 – AN**
Author: Ernesto Guerra	**Discipline:** Physical Science	
Campus: Texas A&M University – Corpus Christi	**Student Level:** Undergraduate	
Co-Authors:	**Mentor(s):** Dr. Mark Besonen	

Abstract
I plan to discuss my personal experience in relation to the 2015 Summer I Study Abroad Program that took place in Scotland. As a student, I plan to emphasize on the overall benefits of studying abroad along with incorporating my experiences involving a Directed Independent Study. As a Geology student, field experience is essential towards developing a greater understanding of the earth's natural geologic processes. By studying abroad the student can ultimately be exposed to different geologic outcrops and is then able to gain a better understanding of past geologic events that the classroom itself cannot offer. Furthermore, I will discuss different approaches of which the program can take when offering extended research trips.Such an approach will require an in depth application process that will ideally create a team of undergraduates that express the skill-set required to conduct efficient and productive research. I will be speaking fro m a standpoint that reflects the different aspects I believe can be improved in order to increase the overall quality of the study abroad experience.

Title: Comparison Between Fixed And Single Axis Tracking Of Photovoltaic Panels		**Presentation ID: A101 – AN**
Author: Bryan Jaksik	**Discipline:** Physical Science	
Campus: Texas A&M University – Corpus Christi	**Student Level:** Undergraduate	
Co-Authors:	**Mentor(s):** Dr. Petru-Aurelian Simeonescu	

Abstract
A study has been performed comparing one stationary photovoltaic solar panel and a second identical solar panel that tracks the sun by pivoting about an oblique axis. The tracking mechanism allows 180 degrees of azimuthal motion, thus extracting an increased amount of energy from the sun. This system is expect to increase the power output of the panel by around 30%. The recorded data was produced by the stationary and tracking solar panels, as well as sun light intensity data. Results from the recorded data between the tracking panel and the fixed panel

has shown that the tracking panel has produced over 35% more power than the fixed panel; this is not including the power consumption of the sun-tracking circuit. Data from the tracking panel will also be applied toward placing the fixed panel at a slight westward offset in order to extract more energy from the panel using a fixed system.

Title: Mutual Friction In Neutron Star Cores	**Presentation ID: A102 – AN**
Author: Christopher Johnston	**Discipline:** Physical Science
Campus: Texas A&M University – Commerce	**Student Level:** Undergraduate
Co-Authors:	**Mentor(s):** William Newton

Abstract
Neutron stars are the super-dense remnants of stars which had masses of 8-25 solar masses. A typical neutron star has a mass of 1.4 solar masses compressed into a ball having a radius of about 10km. The neutron star core, about 1km below the crust of a NS, is a fluid of protons and neutrons. Due to the motion of this fluid, certain observable effects, such as glitches, can be seen in the behaviour of NSs. These effects are believed to occur due to effects such as mutual friction, the interaction between the neutron and proton fluids arising due to nuclear forces. The coupling time constant is related to the mutual friction and is a measure of how tightly the fluid is coupled to the behavior of the crust, and models can be verified by observing effects arising due to this coupling. This project uses widely used classes nuclear models, together with inferences of neutron and proton effective masses at densities typical of nuclei, to estimate the size and uncertainties on the strength of mutual friction and hence the crust-core coupling timescale over a range of densities and proton fractions typical of neutron star cores. This study provides a vital input into hydrodynamic models of neutron star interiors.

Title: Exploring The Physics Of Organic Solar Cells By Drift-Diffusion Simulations	**Presentation ID: A103 – AN**
Author: Aaron Kramer	**Discipline:** Physical Science
Campus: Tarleton State University	**Student Level:** Undergraduate
Co-Authors: Liang Xu, Yun-Ju Lee, Trey Daunis and Julia W.P. Hsu	**Mentor(s):** Julia W.P. Hsu (UTD) and Dr. Bryant M. Wyatt (Tarleton)

Abstract
Drift-diffusion simulations were used to model fill factor, short circuit current, capacitance, energy band, and quantum efficiency with the program SCAPS. The simulations were based on real devices that varied radiative recombination, surface recombination, and acceptor densities.
Increasing radiative and surface recombination decreases both fill factor and short circuit current. Increasing the dopant acceptor density decreases the short circuit current, creates flatband conditions, and increase capacitance. External quantum efficiency curves exhibit flat characteristics for conventional devices and peaks with inverted and thin conventional devices.

Title: The Relationship Between Convergence, Divergence, Recogntion,And Tracking Skills And Batting Performance Of Professional Baseball Players	**Presentation ID: A104 – AN**
Author: TyEisha Lawson	**Discipline:** Physical Science
Campus: Texas A&M University – Corpus Christi	**Student Level:** Undergraduate
Co-Authors:	**Mentor(s):** Dr. Frank Spanol

Abstract
PURPOSE: The purpose of this study was to investigate the relationship between visual skills (convergence, divergence, recognition, and tracking) and batting performance of professional baseball players. METHODS: Three hundred fifty-two (352) minor league baseball players were evaluated for visual skills and batting performance during the 2013 minor league baseball season. Visual skills were measured using Vizual Edge Performance Trainer® (VEPT), a software program which measures eye alignment, depth perception, convergence, divergence, visual recognition, and visual tracking. Visual skill testing was conducted by professional baseball scouts as part of pre-draft player evaluations. Visual skills composite EDGE score was determined by the subtest scores of convergence (CON), divergence (DIV), visual recognition (VR), and visual tracking (VT). Batting performance was determined by 2013 season statistics, which included batting average (BA) , bases on ball percentage (BB%), strikeout percentage (SO%), on base percentage (OBP), slugging percentage (SLG), and on base plus slugging (OPS). Players were divided into quartiles based on each of the four VEPT variables. RESULTS: Descriptive statistics were performed for all variables. Pearson's correlation coefficient and independent samples t-test was used to analyze statistical significance between upper and lower quartiles. PRACTICAL APPLICATION: The results suggest that there is a significant relationship between CON, DIV, VR, and VT skills and batting performance. Coaches and training staffs should consider adding a variation of visual stimuli training to help gauge and train the visual skills of professional baseball players.

Title: Somatotyping Affecting Soccer Players Abilities	**Presentation ID: A105 – AN**
Author: Kenya Lewis	**Discipline:** Physical Science
Campus: West Texas A&M University	**Student Level:** Undergraduate
Co-Authors:	**Mentor(s):** Dr. Vanessa Fiaud

Abstract
Soccer is of the most popular sports in the world and continues to grow. What makes people the best fit for this sport? This study will serve a purpose to help answer that question. Only studying literature that uses the Heath-Carter method, this study will look for the abilities in each position in the game of soccer; it will also look for each positions somatotype. This study will also serve a purpose to create a template that is efficient and helps find somatotype using the Heath-Carter method.

Title: Eft	**Presentation ID: A106 – AN**
Author: Jorge Moran	**Discipline:** Physical Science
Campus: Texas A&M University – San Antonio	**Student Level:** Undergraduate
Co-Authors:	**Mentor(s):** Dr. Cox

Abstract
If when giving a test using critical thinking questionnaires from math algebra to reading English grammar will alter high anxiety levels, stress, or both. Will performer do poorly when test taking then? By using (EFT) emotional freedom technique before and after test taking will lower anxiety levels on a scale 1-10 and by using

GSR-II to measure before and after (EFT) treatment to see whether or not anxiety levels are lower or not.

Title: A Porphryin Based Chiral Imidazolidinone For Chiral Recognition Applications	**Presentation ID: B94 – AN**
Author: John Naizer	**Discipline:** Physical Science
Campus: Texas A&M University – Commerce	**Student Level:** Undergraduate
Co-Authors: Lance Mwangi and Paul Battles	**Mentor(s):** Stephen D. Starnes

Abstract
Imidazolidinones has been found to be effective directing groups in chiral catalysis reactions as well as in asymmetric transformation reactions. The research being done inside the Starnes research group has been focused around the idea of chiral recognition. Because of the use of imidazolidinones in chiral catalysis applications, we have found that they can be utilized successfully for chiral recognition applications as well. The research presented here involves the creation of chiral hosts by appending commercially available imidazolidinones onto a porphryin isocyanate base. The group is studying the interaction between the hosts and chiral guests through means of UV/vis titrations. The guests that have been examined with our imidazolidinone porphyrin hybrid hosts are R & S-mandelate, dimethyl methylphosphonate, D & S-phenylglycine, naproxen, nicotine, and S-Ibuprofen. Here we will present synthetic details and molecular recognition results.

Title: Natural Frequency Of Starnard Wind Generators	**Presentation ID: B95 – AN**
Author: Dustin Neighbors	**Discipline:** Physical Science
Campus: Tarleton State University	**Student Level:** Undergraduate
Co-Authors:	**Mentor(s):** Dr. Ju Xu

Abstract
Summary of natural frequency studies of wind generators under no load and under a 20mph wind load while blades are stopped.

Title: Photometric Study Of A Newly Discovered Contact Binary Star	**Presentation ID: B96 – AN**
Author: Margaret Pappano	**Discipline:** Physical Science
Campus: Tarleton State University	**Student Level:** Undergraduate
Co-Authors:	**Mentor(s):** Shaukat Goderya

Abstract
Binary stars are two stars that orbit a common center of mass and are bound by their mutual gravitational fields. They are very beneficial in the field of astronomy because of their ability to allow us to determine absolute physical parameters of which, mass is one of the most fundamental ones. Contact systems stars are not only physically touching each other, but also have a common envelope around them. They have a usually very short period and are therefore easy to observe and study. Many contact binary systems have a short period, which would indicate that they are in contact with each other. Thus, there is a possibility of the two stars to exchange mass and energy, influencing each other's evolutionary life cycle. For this reason, contact binary stars hold an important place in the study of evolution of single and multiple stars.
The goal of this project is to observe and analyze a newly discovered contact binary star GSC 03502-00138 with the Tarleton 32" remotely controlled optical telescope. Our objective is to determine the exact light elements of the system and make a light curve to model the system with the Wilson-Devinney program. Once the

computational model is done, it will enable us to determine the physical and photometric parameters of the system.

Title: Glucosamine Treatment Effects On Protein O-Glcnacylation And DNA Methylation In Neurons	**Presentation ID: B97 – AN**
Author: Gabriella Perez	**Discipline:** Physical Science
Campus: Texas A&M University – Kingsville	**Student Level:** Undergraduate
Co-Authors: Ricardo Sanchez and Dr. Farah Lubin	**Mentor(s):** Dr. Farah Lubin and Dr. Elda E. Sanchez

Abstract
The ketogenic diet is a high-fat, low carbohydrate diet that has shown to be effective in reducing seizures with epilepsy. This diet targets many metabolic pathways that affect epigenetic mechanisms. One of the pathways the ketogenic diet targets is the hexosamine biosysnthesis pathway (HBP). HBP leads to O-GlcNAcylation, a posttranslational protein modification. One of the substrates involved in the HBP is glucosamine (GlcN). The purpose of this experiment was to investigate GlcN treatment effects on protein O-GlcNAcylation and DNA methylation in hippocampal neurons. GlcN was orally administered to six rats for two weeks. Animal weight, food intake, and water intake were recorded. The rats were euthanized by rapid decapitation, and tissue was collected from the hippocampus and cerebellum. Data analysis indicates that GlcN treatment significantly alters protein O-GlcNAcylation levels in neuronal subfractions and 5-hydroxymethylcytosine levels at CpG-rich sites within memory-related genes. These results suggest that altering the HBP through a controlled diet affects epigenetic mechanisms.

Title: Dialing In The Angular Momentum To Restore The Giant Impact Hypothesis	**Presentation ID: B98 – AN**
Author: Jonathan Petz	**Discipline:** Physical Science
Campus: Tarleton State University	**Student Level:** Undergraduate
Co-Authors: Ty Turner and William Sumpter	**Mentor(s):** Bryant Wyatt

Abstract
Our Moon is no ordinary satellite! It is too large to be a captured asteroid. Could it be a twin planet formed alongside of Earth as our solar system was being created? Or, perhaps a captured rocky planet forced to light our night and give lovers' inspiration? Though this is romantic, the true answer is thought to be much more violent. We believe the Moon was born from a violent encounter of two young proto-planets. This giant impact hypothesis (GIH) is the dominant theory for the formation of our Moon, but has come under question recently because computational simulation of the GIH leave the resultant Earth-Moon system with excess angular momentum. In this work we hope to use our rapid searching method to find the correct initial conditions to produce a system with the proper angular momentum and restore the GIH to its deserved place in astrophysics.

Title: Mapping Pigment Distribution In Mud Samples Through Hyperspectral Imaging	**Presentation ID: B99 – AN**
Author: Shane Smith	**Discipline:** Physical Science
Campus: Texas A&M University-Corpus Christi	**Student Level:** Undergraduate
Co-Authors: Dustin Smith, Elizabeth Shanks, Cosmina Nicula, Christ Trombley, Paul Zimba and Ruby Mehrubeoglu	**Mentor(s):** Dr. Ruby Mehrubeoglu

Abstract
Mud samples collected from bodies of water reveal information about the distribution of microorganisms in the local sediments. Hyperspectral imaging has been investigated as a technology to identify phototropic organisms living on sediments collected from the Texas Coastal Bend area based on their spectral pigment profiles and spatial distribution. The top pigment profiles identified through High-performance Liquid Chromatography (HPLC) include chlorophyll (chl) a, chl b, and chl c2 in addition to the carotenoids fucoxanthin, diadinoxanthin, zeaxanthin, β-β carotene, and lutein. Top five pigment profiles identified through HPLC have been correlated with spectral signatures extracted from the hyperspectral data using Fast Fourier Transforms. Spatial distributions have also been investigated using 2D hyperspectral image processing. 2D pigment distribution maps have been created based on the highest correlation with pigments. The result s show good correlation among the pigment trends in the mud between HLPC and the Fast Fourier Transform results with four out of five tested gpigments.

Title: Point-Based Automated Reproduction	**Presentation ID: B100 – AN**
Author: Tegawende Tiendrebeogo	**Discipline:** Physical Science
Campus: Prairie View A&M University	**Student Level:** Undergraduate
Co-Authors:	**Mentor(s):** Dr. Dongdong Zhang

Abstract
3D printing is the cutting-edge technology to fabricate prototypes and parts directly from 3D digital models. A 3D digital model is either designed using a computer aided design (CAD) software or is generated by scanning an actual object. 3D printing and 3D scanning have been gaining greater popularity due to their capability of capturing and creating 3D parts with complex geometries. 3D printers and 3D scanners are currently used in the medical area to rapidly and efficiently create prosthetics and implants. 3D scanning is mostly used in designs where modeling with computer software is time consuming. 3D scanning is also used for application such as Reverse Engineering (RE) where a computer aided design (CAD) model of an object that reflects how the object was originally designed is generated. A 3D scanner is used to collects distance point measurements (point clouds) from a real-world object and translates them into a virtual 3D object. How ever, there are still some critical technical issues that have not been addressed in current 3D printing and 3D scanning applications.
The background of this research work is to achieve the 3D manufacturing directly from 3D scanning. Traditionally the 3D model reconstruction process (meshing, surface reconstruction) is needed after the scanning process is done , which is tedious and time-consuming, then finally, the model will be input into a 3D printer for manufacturing. In the proposed method, 3D points are directly used for 3D printing without any 3D reconstruction process, which is fast and efficient.

Title: Research On The Centrifugal Lost Foam Casting Process	**Presentation ID: B101 – AN**
Author: Kyle Winfield	**Discipline:** Physical Science
Campus: Texas A&M University – Corpus Christi	**Student Level:** Undergraduate
Co-Authors: Wesley Horadam	**Mentor(s):** Petru-Aurelian Simionescu and Ronald Carlson

Abstract

Centrifugal casting is currently used to generate simple shapes, examples being cylindrical pipes and bushings. The Jewelry industry also utilizes this process. We will be applying this process to lost foam casting, which is normally done using a pouring/gravity process. In this study, we analyzed a comb process of vertical casting of a lost foam pattern immersed and impacted with sand. We utilized a custom centrifuge and safety enclosure that had been developed previously; recording preliminary results gathered by the reported equipment.

Master's

Title: Numerical Simulation On Structural Micro-Scale Riblet Surfaces Of Internal Pipelines To Enhance Fluid Transportation	**Presentation ID: B102 – AN**
Author: Oluwasegun Ajayi	**Discipline:** Physical Science
Campus: Texas A&M University – Kingsville	**Student Level:** Master's
Co-Authors:	**Mentor(s):** Dr. Sangsoo Lee

Abstract

This project aims to investigate the effects of micro-scale, riblet surfaces on fluid transportation in internal pipe lines. It is known that applying micro-scale, riblet surfaces mimicking shark skin, gecko's foot, lotus leaves, etc turns the classical no-slip boundary conditions into the slip boundary conditions and decrease the fluid viscous drag of internal flow resulting in reducing the pressure drop.

The pressure drops of the turbulent flow in a circular pipe with 40 mm in diameter and 1 m in length are obtained using a commercially available CFD software and the results are compared with analytical solutions to evaluate the effects of the surfaces on fluid transportation. To avoid the entrance effect where the micro-scale, riblet surface can increase the pressure drop due to the developing fluid, the micro-scale patterned riblet surfaces are applied where the fluid is fully developed.

It is found out that the micro-scale, riblet patterned surfaces enhance the fluid transportation of internal circular pipelines by decreasing the viscous shear stresses and reducing the pressure drops of turbulent flowing flow.

Title: Experimental Investigation Of Next Generation Waterless Fracturing Fluid	**Presentation ID: B103 – AN**
Author: Suriya Narayanan Balasubramanian	**Discipline:** Physical Science
Campus: Texas A&M University – Kingsville	**Student Level:** Master's
Co-Authors:	**Mentor(s):** Dr. Chongwei Xiao

Abstract

Gas foam stabilized by nanoparticles is a promising fracking fluid to transport proppant, which is superior in properties of tolerance to high reservoir temperature, minimal formation damage, low leakoff rate, and long fissures. It's critical to determine the apparent viscosity and stability of gas foam so as to predict proppant transport in reservoir fractures.

This study investigated the in-situ apparent viscosity of carbon dioxide (CO2) foam stabilized by nano-SiO2 at pressure over 1100 psia and 104 °F in the Flow Loop apparatus. The supercritical CO2 were applied to generate gas foam. The foams generated under high pressure were visualized though a transparent sapphire tube. The effects of foam quality, nanoparticle concentration, salinity, and surfactant on the in-situ apparent viscosity and stability of gas foam were studied.

High viscous gas foams were obtained in the optimal recipe. It has been observed that only the foam height reduces and bubble size did not change much even at 24 hours. The outstanding synergy effect was exhibited among silica nanoparticle, surfactant, and salinity. It's confirmed that certain amount of salinity increases the stability of CO2 foam.

Title: Factors Predicting WIC Participation		**Presentation ID: B104 – AN**
Author: Feb Ray Demasiado	**Discipline:** Physical Science	
Campus: Texas A&M University International	**Student Level:** Master's	
Co-Authors:	**Mentor(s):** Dr. Torregosa	

Abstract
BACKGROUND: The women, infants, and children (WIC) is a supplemental program that provides nutrition and education to pregnant and post-partum mothers. While WIC is major resource for supplemental nutrition for indigent mothers, little is known about the characteristics of WIC participants.
AIM: The purpose of this study is to examine factors that are associated with WIC participation. METHOD: A secondary data analysis was conducted on a sample of n = 116 subjects obtained from an original cross sectional study. IRB approval was obtained in the original study. Data were analyzed using descriptive and logistic regression using SPSS version 20.
RESULT: Mother's level of education and maternal income were associated with WIC participation. Age was not associated with WIC participation.
CONCLUSION: Mothers who participate in WIC are low income and have low education. It is recommended that future studies need to be conducted to examine whether factors associated with WIC participation have any influence on child obesity.

Title: Competitive Binding Of Copper(I) And Zinc(II) By Methanobactin From Methylosinus Trichosporium OB3b And Analog Methanobactin Peptide		**Presentation ID: B105 – AN**
Author: Jacob McCabe	**Discipline:** Physical Science	
Campus: Texas A&M University – Commerce	**Student Level:** Master's	
Co-Authors: Rajpal Vangala	**Mentor(s):** Laurence Angel	

Abstract
Methanobactin (1154 Da) is a class of copper binding peptides identified in methanotrophic bacteria. These copper binding peptides are thought to mediate the acquisition of the copper cofactor for the enzyme methane monooxygenase, which catalyzes the oxidation of methane to methanol. The methanobactin (mb-OB3b) from Methylosinus trichosporium OB3b with a primary structure 1-(N-[thio-(5-oxo-2-(3-methylbutanoyl)oxazol-(Z)-4-ylidene)methyl]-Gly1–Ser2–Cys3–Tyr4)-pyrrolidin-2-yl-(thio-[5-oxo-oxazol-(Z)-4-ylidene]methyl)–Ser5–Cys6–Met7 primarily binds to Cu(I) but will also bind Zn(II). The research presents a study of the competition between Cu(I) and Zn(II) binding by mb-OB3b and an analog methanobactin peptide (amb, 1481 Da) that has a similar primary structure of ac-Leu1-His2-Cys3-Gly4-Ser5-[Cys]6-Tyr7-Pro8-His9-Cys10-Ser11-[Cys]13-Met14 as mb-OB3b but replaces the bi-dentate enethiol oxazolone rings of mb-OB3 b with two His-Cys for comparison. Ion mobility-mass spectrometry (IM-MS), fluorescence, and UV-Vis were used to monitor the competitive titrations of mb-Ob3b and/or amb with ZnCl2 or CuCl¬¬¬2 to study the relative binding affinities for each of these metal ions. Collision-cross section measurements of Zn(II)- and Cu(I)-bound mb-OB3b showed the size of the complex decreased from 256 to 245 Å2 as the molecule rearranges to accommodate Cu(I), indicating a tighter bound conformation for the Cu(I) complex. Fluorescence spectroscopy supported IM-MS data by showing quenching of oxazolone-ring 1 as Cu(I) replaced Zn(II).

Title: The Effect Of Social Influence On Emotions	**Presentation ID: C92 – AN**
Author: Alejandra Rivas	**Discipline:** Physical Science
Campus: Texas A&M University International	**Student Level:** Master's
Co-Authors: Alejandra Rivas	**Mentor(s):** Roberto Heredia

Abstract

The Effect of Social influence on emotions

The current study will attempt to replicate previous studies which emphasize on the impact that social influence has on others. Particularly, this present experiment will look at how emotions can be a major source on social influence. Furthermore, emotions bestow valued information to observers and encourage them to imitate the actions of others based on the different contextual factors (Van Kleef, van den Berg, & Heerdink, 2015). However, not much studies about emotions and social influence have been captured. The purpose of this proposal study is to cause social influence to impact emotions. It will use the same measures of "The persuasive power of emotions: Effects of emotional expressions on attitude and change" (2015). The first scale will seek for positive evaluations (positive, good, favorable), and contains a cronbach's alpha of .96, other measures negative evaluations of a certain object, as well (unpleasant, negative, and bad). This second one has a chronbach's alpha of 87. The manipulative variable will be different, and will consist of gathering a total of around 105 students and exposed them to different stimuli (TV shows, faces making expressions) and having a couple of confederate students responding negatively to positive emotions, for the control group, and no confederate for the other group. Then, results will be evaluated based on what participants score on the two different measures mentioned earlier, after they watch the different stimuli.

Title: Quarterback Throwing Mechanics	**Presentation ID: C93 – AN**
Author: Hunter Storaci	**Discipline:** Physical Science
Campus: Texas A&M University	**Student Level:** Master's
Co-Authors:	**Mentor(s):** Dr. Michael Moreno

Abstract

Throwing a football is a highly technical motion. However, relatively little biomechanical analysis has been performed with respect to the optimization of the motion. Beginning as early as 5 years of age, quarterbacks are coached on "proper" technique, which is based largely on the qualitative assessment of coaching staff. However, many of these coaching points are contradictory or vague, biomechanically speaking.

We worked with 6 quarterbacks from age 12 to age 23 and used an 8 camera Vicon motion capture system to study the biomechanics of their throwing motions. Reflective markers were placed on the subjects at specific anatomical landmarks and the motion capture system tracks these marker positions throughout the throwing motion. Vicon Nexus software was then used to determine marker positions as well as force data from four AMTI force plates and was fed into a full body biomechanical model (Vicon Full-Body Plugin Gait).

With the variation in levels of training and proficiency, we were able to quantify some of the differences between less skilled and more skilled players.

Future work on this study hopes to expand the work into more junior athletes, as well as obtain data from collegiate and professional athletes.

Title: Women Health: How Do Women Feel About Elimination Of Physical Activity Courses From Degree Plan?	**Presentation ID: C94 – AN**
Author: Madhur Varma	**Discipline:** Physical Science
Campus: Tarleton State University	**Student Level:** Master's
Co-Authors:	**Mentor(s):** Jarrod Schenewark

Abstract

Osteoporosis, depression, breast cancer, diabetes, and heart diseases are the top five health problems facing women today. Statistics document a steady decline in women's health. The Center for Disease Control and Prevention (CDC) states 36.4% of women are obese, 32.8% of women over 20 years are diagnosed with hypertension in United States (2009-2012). National Vital Statistics Report (NVSR) in "Deaths: Final Data for 2013" records that major causes of deaths among women are heart diseases, cancer and chronic lower respiratory diseases. However research also validate that physical activity promotes bone density, hormonal balance, cardiovascular health, reduces cancer risks, along with many other health benefits. In the 1920's, 97 percent of American universities required physical activity courses in their degree programs, by 2010 this number had dropped to 39 percent. While elimination of university physical education re quirements has continued to increase and has been justified by administrators, how do college women feel about the elimination of physical activity courses from degree programs, in light of the lifetime of health benefits they may enjoy with the knowledge and habits acquired in these courses? This study seeks to uncover women's attitude concerning required physical education in university degree plan.

Title: Investigation Of Hydrothermal Conversion Of Methylosinus Trichosporium To Bio-Oil	**Presentation ID: C95 – AN**
Author: James Wheeler Jr.	**Discipline:** Physical Science
Campus: Texas A&M University – Commerce	**Student Level:** Master's
Co-Authors: Juan Saravia and Raino Bhatti	**Mentor(s):** Ben W.-L. Jang

Abstract

Methylosinus trichosporium is a bacterium that feeds on methane from the environment. Utilization of this bacterium has a great potential to help solve the global warming issue while generating large amount of biomass for other uses. Further conversion of generated biomass to everyday products would balance the carbon outputs and leaving no carbon footprints in the environment. Research on the hydrothermal conversion of methylosinus trichosporium biomass into bio-oil had never been done before. It is hypothesized that reasonable yield of bio-oil will be produced by the hydrothermal conversion process. In this study, methylosinus trichosporium is hydrothermally converted with different temperature and time, extracted, and isolated to obtain bio-oils. The energy contents of the methylosinus trichosporium biomass and the resulted bio-oils are determined via bomb calorimetry. Thermo gravimetric analysis (TGA) is performed to determine the water co ntent in the biomass and its decomposition behavior. In addition, FT-IR and GC-MS will be used to obtain the composition info of the bio-oil products.

****CHANGED**

Title: Techlet	**Presentation ID: B56 – LS**
Author: Ghufrana Ghufrana Iqbal	**Discipline:** Environmental Science
Campus: Texas A&M University – Kingsville	**Student Level:** Master's
Co-Authors: Shinde Sushil and Shah Akshit	**Mentor(s):** Reza Nekovei

Abstract
A smart world needs smart devices for the ease of complexities in day to day life. So here we present one such device named TECHLET. We have heard a lot about smart wallet and this is one of a kind with less handling chaos and in addition to more features. The main aim of this project is to provide a user a hassle-free, daily usable, simple, smart wallet with the same typical look of a general wallet. The subsystems of the project are Arduino microcontroller, GPS, Security System (Near Field and Far Field Communication), Magnetic stripe sensor, RFID Locking System. Each segment contributes in the system as a whole to make it a successful low cost electronic smart device.
In contrast with the past, The Magnetic Stripe Sensors are the most trivial part in the field of card authentication. There are many such different sensors with different applications. Magnetic sensors identify any changes or disturbances to the magnetic flux. Magnetic flux is created when the bar like magnets, containing one's personal information, starts colliding with one another. The very crucial subsystem is including Anti-Theft Technology within the product and that can be done using The RFID locking system.

Title: Techlet	**Presentation ID: C52 – LS**
Author: Akshit Shah H	**Discipline:** Environmental Science
Campus: Texas A&M University – Kingsville	**Student Level:** Master's
Co-Authors: Ghufrana Iqbal and Sushil Shinde	**Mentor(s):** Reza Nekovei

Abstract
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Now-a-days, tracking has been important. Generally tracking system is used for observing of persons or objects on the move and receiving the timely ordered sequences of respective locations data to a model. For tracking of this device we are going to use GPS tracker with TinyDuino (Arduino) Controller with the help of SD card in it. TinyDuino GPS is designed to provide most of the GPS technology.It will be easier for the wallet holder to track his wallet whenever it get lost or stolen, we track it through GPS system. With the help of Micro-controller we can also have a track about our Credit card, Debit card, etc by Magnetic Stripe sensors. Controllers also controls the security of this wallet by controlling RFID sensor or Bluetooth control Or GSM module.

Title: Techlet	**Presentation ID: C58 – LS**
Author: Sushil Shinde	**Discipline:** Environmental Science
Campus: Texas A&M University – Kingsville	**Student Level:** Master's
Co-Authors: Akshit Shah and Ghufrana Iqbal	**Mentor(s):** Dr. Reza Nekovei

Abstract

A smart world needs smart devices for the ease of complexities in day to day life. So here we present one such device named Techlet. We have heard a lot about smart wallet and this is one of a kind with less handling chaos and in addition to more features. The main aim of this project is to provide a user a hassle free, daily usable, simple, smart wallet with the same typical look of a general wallet. The subsystems of the project are Arduino micro-controller, GPS, security system (near field and far field communication), Magnetic Stripe Sensors, and RFID locking system. Each segment contributes in the system as a whole to make it a successful low cost electronic smart device.

Techlet will consists of security features such as Bluetooth technology which will help to lock or unlock the device using android application. GPS technology is used to track location of the device. Bio-metric Technology consists of the voice recognition through which we can provide voice Authentication in the device.

Doctoral

Title: Robust Voltage Tracking For Distributed Three-Phase Inverters	**Presentation ID: C96 – AN**
Author: Samuel Bamgbose	**Discipline:** Physical Science
Campus: Prairie View A&M University	**Student Level:** Doctoral
Co-Authors: Dr. Yongpeng Zhang and Dr. Lijun Qian	**Mentor(s):** Dr. Lijun Qian and Dr. Yongpeng Zhang

Abstract

A major challenge with Distributed Power Generation System is how to effectively maintain synchronization between distributed generators/ inverters and the power grid. The existing synchronization control method with Phase-Locked Loop (PLL) will leave a constant phase offset in the reference tracking. And the unsynchronized power among distributed nodes will introduce transient fluctuations due to switch commutation, leading to power quality deterioration.

This presentation will introduce an improved method with Internal Model Principle (IMP) to realize offset-free voltage vector tracking of distributed three-phase inverters. The proposed system does not need PLL, including its corresponding hardware, leading to cost and complexity reduction. Linear Quadratic Regulator (LQR) is introduced in the state feedback and the state feed-forward design to achieve an optimized performance for the closed-loop system. And digital redesign is conducted to obtain the corresponding discrete-time controller in z-domain. Performance of the controller was evaluated for balanced loads as well as unbalanced reactive loads. Robust stability and performance analysis were done to quantitatively define the robustness boundary and specify performance limit with respect to unstructured uncertainty.

Title: Investigation Of Wave Energy On The Texas Coast	**Presentation ID: C97 – AN**
Author: Francisco Haces-Fernandez	**Discipline:** Physical Science
Campus: Texas A&M University – Kingsville	**Student Level:** Doctoral
Co-Authors:	**Mentor(s):** Dr. Hua Li and Dr. Alvaro Martinez

Abstract

Due to the great and growing demand of energy in the Texas Coast area the generation of electricity from ocean waves is considered very important. The combination of the wave energy with offshore wind power is explored as a way to increase power output, obtain synergies, maximize the utilization of assigned marine zones and reduce variability. In this research the electric power generation from ocean waves and wind along the Texas Coast is investigated, assessing its potential from the meteorological data provided by five buoys from National Data Buoy Center of the National Oceanic and Atmospheric Administration, considering the Pelamis 750 kW Wave Energy Converter (WEC) and the Vesta V90 3 MW Wind Turbine. The power output for wave energy was calculated using a Matlab script and the results in several locations were considered acceptable in terms of total power output, but with a high temporal variability. To reduce variability this resource was combined with wind energy, obtaining a significant reduction on the Coefficient of Variation on wave.