

Undergraduate Research Symposium May 19, 2017 Mary Gates Hall

Online Proceedings

POSTER SESSION 3

Commons East, Easel 61

2:30 PM to 4:00 PM

Scalable Synthesis Method for Monodisperse Silica Nanoparticles

Brandon Chen, Senior, Mat Sci & Engr: Nanosci & Moleculr Engr

Mentor: Devin MacKenzie, MSE and ME

Mentor: Holly Brunner, Materials Science and Engineering

Composite materials utilizing nanoparticles can exhibit improved properties and qualities. Silica (SiO_2) nanoparticles exhibit unique optical, electrical, and mechanical properties and are an ideal candidate for the dispersed phase in many applications, such as precursors for optical films with controlled optical properties and rheology. Atomic forces dominate when particles shrink to sizes below the visible wavelength spectrum, generating unique phenomena. One problematic phenomena, however, is the agglomeration of primary particles into a polydisperse collection of dimer, trimer, or larger secondary particles when calcined or mixed into the continuous phase of the composite. Monodisperse colloids and nanopowders are critical for consistent and optimized performance of composites and nano features. Silica particle synthesis has been well researched, but the practicality of producing pure, monodisperse, and non-agglomerated particles at scalable operations is still in question. This research investigates the factors leading to the agglomeration of spherical silica nanoparticles when synthesized with variations of the Stöber method, and evaluates changes in synthesis parameters that can reduce agglomeration in order to determine the most viable process for scalable production. Parameters that are manipulated include the ratio of ammonia catalyst with tetraethyl orthosilicate (TEOS) in ethanol or methanol solvents and the addition of anionic electrolytes. SEM imaging is then used to evaluate the distribution of the particles. Surface treatments for anti-agglomeration as incorporated into the synthesis process or as post processing are also evaluated, with minimal remnant impurities in the product as a priority. The end goal of this research is to successfully synthesize monodisperse sub-10 nanometer silica particles for pseudoplastic shear-thinning precursors used in fast throughput nanoimprinting of an antireflective layer for solar cells.

POSTER SESSION 3

Commons West, Easel 38

2:30 PM to 4:00 PM

College Sports and Academic Achievement: A Study of Minority Student Athletes at the University of Washington

Stephanie Benipal, Senior, Anthropology: Medical Anth & Global Hlth

Mentor: Holly Barker, Anthropology

The spike in commercialization of college sports programs raises the issues that student athletes' are facing more difficulties to achieve academically. Collegiate athletes playing at the Division 1 level has shifted from mere competition for students to a massive business enterprise that brings in millions amount of revenue to universities. The purpose of this study was to (1) determine the relationship between team subcultures, parental influence, coach/teammate influence, learning environment, training, financial aid, prior high school requirements of play and academic assistance influence academic achievement of Minority university athletes, (2) determine if differences exist between non-minority and minority student athletes' within the same subculture of that team and (3) determine if there are differences between minority student athletes' success in Division 1 men and Division 1 women, in regards to academic achievement within their respective teams subculture. Ultimately, were minority student athletes getting a chance to engage in the academics that are the school's trade-off for the profit it makes from students' athletic labor or does the team subculture emphasize the athletic aspect as opposed to academic achievement? Using convenience sampling, respondents were chosen from among the University of Washington football, basketball (men and women's) and volleyball team. The sample consists of 50-student athletes from the University of Washington who are pursuing their studies while representing their university in one of the listed sports team. Respondents completed (a) an interview assessing the attitudes and behavior of their environment, by teammates and coaches, (b) an assessment scale of involvement with faculty pertaining to academics vs. athletics, (c) demographics Q&A which assess gender, race, athletic status, and prior high school academic achievement. Data were analyzed using descriptive statistics, descriptive analysis and logistic regression. This study concludes with a series of suggestions and recommendations on

how to improve the academic achievement of the intercollegiate minority student athlete population.

POSTER SESSION 4

Commons West, Easel 41

4:00 PM to 6:00 PM

Body Image in Sports

*Emmalyn Michelle (Emma) Lee, Junior, Anthropology:
Medical Anth & Global Hlth*

Mentor: Holly Barker, Anthropology

How are female athletes, specifically gymnasts, being portrayed in the media? We as a society look at their bodies versus their ability to do the sport. I used critical discourse analysis by analyzing the ways in which athletes are portrayed in gymnastics. I used critical discourse analysis because it allows me to show the bias in reporting of the media and negative portrayals of female gymnasts. Using articles and social media, I showed the way female bodies are being represented in certain words and phrases as well as pictures. This work heavily draws on the theories of David Machin and Andrea Mayr. I found it is important because as a society we need to change the way we talk about athletes and their bodies. It's not right or valid to judge an athlete on what their body looks like and disregard their athletic ability. Through this research, I can begin to open up the discussion about their athletic ability instead of their bodies.

POSTER SESSION 4

Commons West, Easel 43

4:00 PM to 6:00 PM

Tahitian Representations within Media Surrounding French Nuclear Testing

Anna Fahlstrom, Senior, Anthropology: Medical Anth & Global Hlth

Mentor: Holly Barker, Anthropology

What impacts did colonial bias create regarding the representations of the Tahitian people in discourse surrounding the 1995 reinstatement of French nuclear testing in French Polynesia? French nuclear testing in French Polynesia occurred from 1966-1996 at Mururoa and Fangataufa Atolls. Nuclear testing was suspended for 3 years from 1992 until 1995, and was met with great resistance and riots in Tahiti by the Tahitian people as well as worldwide when it resumed. I used critical discourse analysis (CDA), drawing off ideas from Machin and Mayr, to critically analyze different forms of discourse surrounding the representations of the Tahitian people upon the reinstatement of nuclear testing. CDA is a useful tool to expose power imbalances within discourse and to challenge and disrupt the power and status quo within discourse.

This creates a space to actively challenge and work against the discourse at hand, while providing an opportunity for new forms to be produced. My research shows whose voices are missing from discourse, thus allowing discourse from multiple voices to be produced in the future. Furthermore, this research serves as a basis for undergoing CDA on discourse surrounding other nuclear testing sites, allowing the discourse to be challenged and changed to provide accurate and well-rounded representations surrounding nuclear testing.

POSTER SESSION 4

Commons West, Easel 42

4:00 PM to 6:00 PM

Nature Deficit Disorder in Seattle Youth

Jade N (Jade) Hoiby, Senior, Anthropology

Mentor: Holly Barker, Anthropology

The ubiquitous presence of technology in daily life has made for a multifaceted discourse on rethinking how to approach teaching, learning and studying in the modern age of distraction. Across the globe, individuals from various walks of life are worried about children, their lack of engagement with nature and the hazardous ramifications to come as a result. Richard Louv gave this growing disconnect an identity when he termed it "Nature-Deficit Disorder"; which looks at the human costs of alienation from nature. The increased dominance of screens in childhood upbringing not only enables a series of rather unsettling childhood trends such as obesity, depression, and attention disorders, but it also strengthens the societal narrative that technology is the future, and nature is a thing of the past. In this research, I explore the inner workings of the outdoor and nature-based preschool movement in Seattle, Washington. How can preschools be more effective in promoting a reverence for nature to the upcoming generations? In particular, I look at how preschools promote a reverence for nature, how children experience and define nature when afforded such exposure at a pivotal time developmentally and how that differs from past generations, and how outdoor and nature-based education models help to expand and redefine "quality standards" that contribute to the achievement gap. In order to answer these questions, I will partake in critical observation of two classrooms from separate outdoor nature-based preschools. Analysis of current curriculum and education-models highlight ways in which these institutions aim to foster an innate sense of appreciation of the natural world for their students. A series of series of interviews with teachers and administrative staff will provide insight into the progression and perceived trajectory of the outdoor and nature-based preschool movement and a better understanding alternative educational pedagogies.