Virtual Student Presentation Session

The NPSMA 2020 virtual conference presentation planning committee has opened a session for student video presentations to highlight their professional experiences, internships, and final projects. Program directors can nominate one student presentation per affiliated PSM program; current students and recent alumni who have graduated within the last year may be nominated. The conference committee will select ten video presentations for broadcast on November 13, 2020, at 3 pm EST. Session chair Ray Hoobler (University of Utah) will host workshops on October 10th and 11th to assist students in preparing presentations, with follow-up meetings as needed. All submitted presentations will be available for viewing.

General guidelines for the video presentations are: 1) The video presentations will be less than 5 minutes in length, 2) The style of presentation is flexible. A simple recorded PowerPoint presentation, video recording of a "TED" style talk, multimedia content, or other creative production is acceptable, 3) While encouraging creativity, students should focus on the importance of their work and its broader impact. The deadline for nominations is Friday, October 2nd, 2020. Send nominations to the session chair (ray.hoobler@utah.edu).

INNOVATOR Feature Article: PSM Alumni and Students on Pandemic Response

Have students or alumni of your program been involved in a response to the coronavirus pandemic? If so please send a paragraph describing how they have helped in our national or global response to the pandemic to INNOVATOR Editor Natalie Bosecker (natalieb@llinois.edu) and VP for Publications Linda Strausbaugh (linda.strausbaugh@uconn.edu). Submissions will be collected into a special feature article for the fall 2020 issue. Paragraphs should include: Student/alum name, PSM program & university; Short introduction to the place of internship or employment; What was the pandemic-related question/project?; What role did the PSM student/grad play?; What was the outcome/contribution/solution from the project?; Optional quote from student, program or employer. The submission deadline is September 30, 2020.

PSM Virtual Graduate Fair

The NPSMA will again organize a PSM online recruitment event through CareerEco. The event is free to Prospective Students who are interested in learning more about the Professional Science Master's, an innovative degree that offers technical and scientific research combined with professional skills. The fall Virtual Graduate Fair featuring PSM programs is scheduled for Friday, October 16, 2020. Affiliated member institutions may sign up at https://CareerEco.com/Events/PSM. Recruiting just one student from this event will more than cover the cost to participate! Questions about program participation may be directed to VP for Marketing and Outreach Kristin Kuter (kjehring@stmarys.edu). To learn how to become an affiliated PSM program, contact NPSMA President Tim Born (born@evans.edu) or Affiliation Committee Chair Avril Robertson (a.robertson3@uq.edu.au).
On Thursday, November 7, 2019 students from across the United States participated in the NPSMA Three-Minute Presentation (3MP) Competition. The annual competition is open to current students and recent graduates from PSM affiliated programs. This opportunity allows students to showcase their master’s projects and provides a unique opportunity to demonstrate the professional skills developed as part of their graduate studies. For the audience, the student presentations exhibited the breadth of programs working under the PSM framework.

Seven students participated in the event with Nathan Edwards from Colorado State University placing first in the competition. Nathan’s presentation was title: Methods of Reducing Food Waste within Managed Populations at Busch Gardens Tampa Bay. He is a 2020 graduate from the Zoo, Aquarium and Animal Shelter Management program. Molly Selleck, also from the Colorado State University and the Zoo, Aquarium and Animal Shelter Management program placed second with her talk titled: Why are you doing that, how can I get you to do something different, and how can I communicate that to others? Using ZooMonitor to Set Behavioral Goals for Animals in Our Care. Molly is also a 2020 graduate. Placing third was Triniti Jensen, a 2019 graduate from the University of Utah’s Science Instrumentation program. Triniti’s presentation was titled: Evaluation of Performance Characteristics Among 16 Same Make-And-Model Tandem Mass Spectrometers. While these three students received awards, each presentation was well received by the conference attendees.

The abstracts and title slides for each presentation are below.

**Methods of Reducing Food Waste within Managed Populations at Busch Gardens Tampa Bay (Winner - First Place)**

Nathan Edwards, Colorado State University, Zoo, Aquarium and Animal Shelter Management. PSM student of Dr. Jennie Willis.

I am a Master’s Candidate at Colorado State University in Zoo, Aquarium and Animal Shelter Management. Throughout years leading up to this degree program, I have gotten experience in Zookeeping through a Summer long internship at the Utica Zoo. I also have experience in informal education through a Zookeeping Camp as well as acquiring NAI Interpretive Guide Certification. I have also spent several semesters teaching undergraduate lab classes at Colorado State University.

Every year zoos feed out millions of pounds of food to their animal residents. However, throughout daily feeding operations there is a lot of room for wasting food. Due to high standards, contamination and excess ordering, food waste can cause significant economic loss to the organization. Although daily waste might be small, the cumulative money equal to this waste throughout the year adds up rapidly and can greatly impact the organization. Throughout a study done at Busch Gardens Tampa Bay, various animal care departments will be observed to locate areas of food waste. Based on these observations, different plans will be created and set in place to minimize the amount of food wasted. With proper maintenance of avian diets and animal behavior, food waste can be cut to a minimum to free up expenses for other crucial projects.

(Continued on pg. 3)
Why are you doing that, how can I get you to do something different, and how can I communicate that to others?

Using ZooMonitor to Set Behavioral Goals for Animals in Our Care (Second Place)

Molly Selleck, Colorado State University, Zoo, Aquarium and Animal Shelter Management. PSM student of Dr. Jennie Willis.

Zoo science research findings have greatly supported the concept of environmental enrichment as a successful technique to addressing stereotypic behaviors in captive animals. Advancements in behavior research continue as the community develops behavior ethogram monitoring processes and technology to develop and compile activity budgets for zoo animals. The most recent technological advancement is an application called ZooMonitor, currently being used by institutions all over the United States. Using these activity budgets, enrichment plan modeling is also experiencing a shift. Animal care teams have begun to focus on specific behavior modifications rather than just species natural history when designing enrichment techniques. I believe these advancements are the correct path to follow, so I have implemented the use of ZooMonitor at the Denver Downtown Aquarium as well as compiled and implemented new behavior monitoring training information. Similar to other institutions, this implementation has maximized the ease of data recording to apply to management decisions such as enrichment determinations.

Evaluation of Performance Characteristics Among 16 Same Make-And-Model Tandem Mass Spectrometers (Third Place)

Triniti Jensen, University of Utah, Science Instrumentation. PSM of Dr. Ray Hoobler.

This research focuses on the current knowledge gap in clinical laboratory operations of assay portability and expansion. ARUP has more than 80 mass spectrometers of which there is no documentation on performance comparison among the mass spectrometers nor is there a procedure to test and quantify an instruments performance abilities to the extent that is needed. It became critical and essential to have fast transitions to new or additional instruments to uphold the mission of ARUP. Being a CLIA and ISO regulated laboratory methods can not deviate from the validated method and standard operating procedure. Some instruments require unique, optimized settings to obtain the same sensitivity compared to another instrument. This disagreement could require months of revalidation work and ultimately, a significant amount of money and resources.

This study demonstrated the need to optimize instrument parameters for each instrument and that assay portability might not be as easy as expected. Additionally, the lack of check standards for cases like this can cost a company not only money but can decrease trust clients have for the laboratory, potentially causing the loss of clientele. A singular case was examined where a loss of at least 2% in revenue, a repeat rate increase from 2.5% to 7%, and a turnaround time increase of 3-57 hours was seen. These adverse effects do not take into account the patients well-being or the time scientists and engineers spent investigating the issues. The described study could be implemented to understand interment performance better, reduce assay portability time, and ultimately help ARUP uphold the highest quality of patient care.

(Continued on pg. 4)
PSM 3MP STUDENT PRESENTATIONS (cont. from pg. 3)

Acceleration of Spinach Seed Germination to Improve the Efficiency of Aeroponic Urban Farming

April Dawson, California State University San Marcos, Biotechnology. PSM student of Dr. Betsy Read and Dr. Albert Kern.

As a Research Associate in LUV’s Biosciences department I work alongside our farmers and engineers to improve the growth of our plants. The Biosciences Department focuses on coming up with novel or unexpected ways to apply biology or biotechnology to enhance productivity or reduce costs. The success we’ve had is part of what has enabled LUV to wildly outproduce other vertical farms of similar size and energetic input.

Local Urban Vegetables (LUV) in Whittier, California aims to optimize and completely automate the process of growing vegetables aeroponically. Their mission is to grow healthy food directly in high-population cities while minimizing the carbon footprint from seed to delivery. Most vegetables can be grown successfully using indoor modern farms, but some are notoriously difficult. Notably, spinach is often regarded as slow-growing and incapable of turning a profit due largely to its abnormally long germination phase. The aim of this project was to develop a protocol to reduce the time from sowing to germination for spinach so that LUV can grow this nutritious vegetable profitably. Seed priming is a blanket term for any pre-treatment that hastens the germination process.

To accomplish the goal of the project, four priming methods that each function on a different biological mechanism of germination were tested on spinach seed. The methods were optimized individually and then combined to seek better results than could be accomplished by any one method applied in isolation. The result of applying these treatments concurrently was a seed that germinated five days sooner than control seeds. This improvement is put into perspective when looking at overarching patterns of production. Through a decrease in turnover time, a five-day improvement in germination time allows the same area to produce 26% more revenue with similar energy and nutrient inputs. This project highlighted the versatility of the PSM program training as it encompassed basic biology and experimental design as well as practical business applications and analysis.

Automated Mosquito Classification

Travis Draper, University of Utah. Computational Science. PSM student of Dr. Ray Hoobler.

onVector Technologies produces sensors to count mosquitoes as they enter mosquito traps. Their next generation sensor is designed to make an audio recording of mosquitoes for classification by an onboard computer.

The project involved analyzing and testing various machine learning models, as well as evaluating various representations of the wing beat recordings to feed into the models. This new sensor along with the classification system will allow researchers and mosquito abatement professionals to monitor mosquito populations with much greater ease, and free up resources within mosquito abatement programs.

(Continued on pg. 5)
Assessing the Performance of Statistical Assessment for Friction Ridge Evidence

Michael P. Kessler, Florida International University, Forensic Science. PSM student of student of Dr. Sara Casado Zapico.

In cooperation with the U.S. Army Criminal Investigation Laboratory (USACIL) and the Fort Worth Police Department Crime Laboratory, the performance of a similarity metric-based statistical assessment software tool for measuring the strength of correlated friction ridge features—FRStat—was evaluated.

FRStat was developed by USACIL to provide statistical strength to fingerprint analysis. The method measures the similarity between two configurations of friction ridge skin features and calculates a similarity metric that employs statistical modeling of the distributions of the similarity statistic values from mated and non-mated impressions to provide the statistical assessment of the strength of the friction ridge impression evidence. The performance was evaluated using a variety of mated and non-mated datasets. The results show that this novel approach correctly identified mated and non-mated pairs and consistently measured similarity statistic values across examiners and friction ridge impressions. The results further provided validation of the foundations behind the science of friction ridge discipline. Although there are limitations to its capability, this method shows potential in strengthening the reporting of friction ridge impression comparisons with an empirically grounded basis.

The Waste Industry in a Changing World

Christopher Kocay, Northern Arizona University, Climate Science and Solutions. PSM Student of John Fegyveresi

The waste and recycling services industry is seeing a paradigm shift as the consumptive habits of people are shifting and the ecosystem of the industry must change with it. I had the opportunity to be a part of the Corporate Internship Program at Republic Services in Scottsdale Arizona over the summer of 2019. The projects I worked on include the formation of a duty specification document for recycling center heavy equipment, end of life sales of aging fleet equipment and trucks, and some time working on the electrification of their trucks, and their methane recapture at their landfills. All of these projects were given a set amount of time each week to work on and progress was reported weekly to my supervisor and senior manager. The outcomes of my internship include the creation of a first-of-its-kind duty specification document for recycling center heavy equipment, updating the end of life requirement for the sale of heavy equipment and trucks, and fleet management process standardization. The connection to my PSM program training were aspects of corporate business, communications and regulatory affairs tying in mathematics and science disciplines.

(Continued on pg. 6)
PSM PRESENTATION COMPETITION (cont. from pg. 5)

Special thanks to **Dr. Jennie Willis**, NPSMA Board of Directors member and PSM Program Coordinator at Colorado State University, who provided valuable assistance in the development and evolution of the PSM student competition over the last three years. Also to our esteemed judges:

- **Mr. Spencer Hadelman**, CEO Advantage Marketing
- **Dr. Gerald B. Grunwald**, NPSMA Convener and Dean of the Jefferson College of Biomedical Sciences, Thomas Jefferson University
- **Dr. Tim Born**, NPSMA President-Elect and Associate Dean, Padnos College of Engineering and Computing, Grand Valley State University

Finally, our sincere gratitude to the 2019 3MP event sponsor ProQuest, our other generous event sponsors, and the institutions who provided support for their students to participate.

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**2019 NPSMA 3MP SPONSORS**

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For more information on how your students can participate in and your company/institution sponsor this exciting program at the 2021 NPSMA National Annual Conference in Tampa, Florida view the Three Minutes Presentation (3MP) Student Competition Guidelines and Nomination Form and the Sponsorship information. Nominations of participants are due September 20, 2021.
Alumni Profiles

ELIZABETH LANGFORD
PROFESSIONAL SCIENCE MASTER’S: ENVIRONMENTAL SCIENCE
OREGON STATE UNIVERSITY, 2020

PSM APPLIED TO AIDING FORESTY

Elizabeth graduated from Oregon State University in the spring of 2020, earning a Professional Science Master’s in Environmental Science with a concentration in Water and Natural Resource Management. During the PSM program she also completed the 2-year Rocky Mountain Land Management Internship with the United States Forest and Colorado Mountain College.

“This project is an attempt to develop a GIS-based risk analysis framework for the Medicine Bow-Routt National Forests,” Elizabeth explained. “The analysis begins by assessing the geomorphology of the land within the special use permit boundary of the Steamboat Ski Area focusing on naturally occurring geomorphic risks such as erosion, compaction, and mass wasting potential. The factors are analyzed using a weighted analysis with the raster math toolset. Next, I overlaid the projects from the 2018 EIS document and identified which of these projects overlapped with previously identified high-risk areas.” She concludes, that this information will be used to aid Forest Service and ski area personnel, project designers, and construction supervisors on current and future projects.

Contributed by Carolyn Fonyo, PhD, Director, Environmental Sciences Graduate Program, Oregon State University.

THAIUS BOYD
PROFESSIONAL SCIENCE MASTER’S: ENVIRONMENTAL ASSESSMENT
UNIVERSITY OF KANSAS, EDWARD’S CAMPUS, 2019

PSM GRADUATE USES HIS SKILL SET TO IMPROVE HEALTH OF CHILDREN

Thaius Boyd chose the University of Kansas Edwards Campus to earn his Professional Science Master’s in Environmental Assessment and graduated in May of 2019. He credits the university for preparing him for continuing his education at the University of Minnesota Medical School where he is finishing his first year.

“I gained a strong foundation in environmental assessment through rigorous science classes,” Boyd said. “And, I felt prepared to take on future leadership roles because of my classes in writing, speaking, and project management.”

The oldest son of a university professor mother and mechanical engineer father, Boyd earned his undergraduate degree at nearby Haskell Indian Nations University in Lawrence, Kansas where his mother works and younger brother, Siam, and sister, Jasmine, currently attend. He said he is the happiest when he is mentoring and inspiring younger generation Native American students to pursue higher education and to achieve their ambitions and goals.

Boyd plans to take these skills and his medical degree to improve the health of children.

(Continued on pg. 8)
ALUMNI PROFILES, THAIUS BOYD (cont. from pg. 7)

He said he hopes to bring together the environmental angle and the perspective he has acquired from KUEC into medicine where he can provide both patient-centered care and improve the health of the community through environmental-health assessments. After his first year of medical school, he has set a long-term goal of becoming a pediatric orthopedic surgeon.

“Many communities are subjected to environmental problems and injustices that are impeding on their health and wellness,” Boyd said. “I am motivated to solve this problem by bringing the unique environmental angle and perspective I have acquired at KUEC to provide both compassionate patient-centered care and establish environmental practices and regulations to improve health for all.”

Contributed by Terri Woodburn, PhD, Program Director/Assistant Teaching Professor, Professional Science Masters, University of Kansas, Edwards Campus.

CALYN JEW
PROFESSIONAL SCIENCE MASTER’S: SUBSURFACE GEOSCIENCE
RICE UNIVERSITY, 2017

HIT THE GROUND RUNNING IN THE ENERGY INDUSTRY OF TODAY

Calyn received her BS in Geology from the University of Texas at Austin in 2015. Her first internship after graduation confirmed her early aspirations to pursue a career in energy. Rice University’s Master’s of Subsurface Geosciences program offers a unique program that Calyn wanted to pursue for the combined technical geoscience courses and the industry focused business education that included a required work experience. “My internship at Statoil was eye-opening and taught me so much about real life applications and business practices”, Calyn explained after returning to campus.

After finishing the PSM program in the Fall of 2017, she joined Statoil to work U.S onshore unconventionals as an operations geologist. After a year and a half of operations in continuous resource plays, she rotated to an offshore exploration geology role for Equinor-Statoil. “I have been fortunate to expand my knowledge and apply it in real life settings during my time with Statoil/Equinor, and I am ready to explore other options.” Calyn explains, “beginning of 2020, I joined Repsol as a development geologist supporting the Eagle Ford asset, and looking forward to further expanding my expertise. The Subsurface Geoscience program at Rice offered the most rounded education in the field that I could find and provided me not only with advanced science knowledge but also understanding of business and management, which has been instrumental in advancing my career so far.”

Contributed by Dagmar Beck, Director, Professional Science Master’s Programs, Rice University, Wiess School of Natural Sciences, Houston, TX.

(Continued on pg. 9)
The Importance of Laboratory Research Skills and Networking

It was an interest in enhancing her research skill set that led Courtney Gunter to enroll in the M.S. Microbial Systems Analysis program in the Department of Molecular and Cell Biology (MCB) at the University of Connecticut (UConn) in the spring of 2013. After completing her double major in Biology and Microbiology at the University of Massachusetts (UMass), Courtney began to look for master’s programs that would prepare her for a career in research. As Courtney recalls, “I looked online in the New England area for Master’s degree programs in Microbiology, and the PSM program sounded like a great fit for what I was looking for.”

(Continued on pg. 10)
ALUMNI PROFILES, COURTNEY GUNTER (cont. from pg. 9)

Upon arrival at UConn, Courtney found the PSM program provided various opportunities to build up her skill sets, preparing her for a future career in academic research. “I learned a lot of standard as well as cutting edge techniques by taking the modules that were offered in the program, and also became very confident in doing benchwork, which is something that most employers are looking for,” Courtney recalls. “It gave me exposure to many different lab techniques, which made me very well-rounded and able to manage a study with lots of different moving parts.”

During her final semester in the Microbial Systems Analysis PSM program, Courtney accepted an internship at AxioMx, Inc. an Abcam Company in Branford CT, as a member of the Product Development team, which led to a full-time position as an Associate Scientist.

Currently, Courtney works at the Jackson Laboratory for Genomic Medicine (JAX-GM) in Farmington, CT, as the Program Manager for the Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) Center. Her role includes data analysis and management, coordination and communication between the collaborators involved in the project, and community outreach for patient advocacy and education.

As to her assessment of the PSM program, Courtney says, “I felt very prepared after finishing the PSM program. I think the program is great for students who want to do scientific research but aren’t interested in doing a PhD. The program makes you a very well-rounded and desirable candidate for many different types of companies, and also puts you in networking situations that can lead to job opportunities.”

Submitted by Elaine Mirkin, M.S., Director of Graduate Professional Education, Department of Molecular and Cell Biology, University of Connecticut.

ASTRID FUENTES
PROFESSIONAL APPLIED AND COMPUTATIONAL MATHEMATICS (PACM) BUFFALO STATE COLLEGE SUNY, 2016

Using PSM Degree to Build Professional and Technical Skillset

From a young age Astrid had a passion for computers and technology. After graduating from high school, she started an undergraduate program at the University of Carabobo (Universidad de Carabobo) in Valencia, Venezuela where she graduated with a bachelor’s degree in Mathematics. Interested in studying abroad, Astrid applied to the Professional Applied and Computational Mathematics (PACM) program at Buffalo State College in Buffalo New York. In 2012, she was accepted and selected for a graduate assistanceship position.

As a graduate assistant she helped math education students with their professional portfolios and assisted IT efforts. During the program she learned extremely valuable real-life applications of mathematics and technology and took courses in public speaking, statistics, and databases allowing her to gain skills which directly impacted her career.

"During my time as a PACM student I was able to acquire and develop important personal and technical skills that became useful tools in my career. I also met some incredible bright faculty members and colleagues."

After graduation she received a job working for Frontier Science and Technology, a prestigious non-profit data management center in Amherst, NY. Here, she not only applied and further developed her database knowledge but also ex-

(Continued on pg. 11)
ALUMNI PROFILES, ASTRID FUENTES (cont. from pg. 10)

panded her professional career leading to a position as a Senior Database Operations Specialist, responsible for leading the ETL team. Her daily work involves working with groups from multiple departments to create and maintain important clinical studies funded by the NIH, pharmaceutical companies, and organizations across the globe.

“The PACM program has played a crucial role in my professional career and I strongly recommend it to those who find applied mathematics interesting however don’t necessarily see themselves in mathematics research or education and prefer to work in emerging technologies that demand deep mathematical understanding.”

Contributed by Heather Campbell M.S., Program Coordinator, Professional Science Masters Data, SUNY Buffalo State College, Buffalo, NY.

ROSS PIPPEN

PROFESSIONAL SCIENCE MASTER’S DEGREE PROGRAM: BIOTECHNOLOGY
CALIFORNIA STATE UNIVERSITY SAN MARCOS, 2020

PSM Launches an Entrepreneur

After 10 years as a scientist and consultant in the water quality management industry, Ross Pippen recognized the shortcomings in protecting public waters from contamination. He had also developed a solid understanding of the Clean Water Act and water quality regulations at federal, state and municipal levels for Fecal Indicator Bacteria (FIB) and the pathogen presence they aim to predict.

As a student in the Master of Biotechnology, a Professional Science Master’s program at California State University San Marcos, Ross considered how to put an entrepreneurial spin on his expertise in water quality management. His culminating project was to prepare a technology strategy and business plan to commercialize a procedure for FIB monitoring and direct pathogen detection in various water matrices.

Seeking support from a broad spectrum of experts and technology advisors, he focused on developing a field-deployable, real-time, user-friendly sampling and molecular detection process. The technology platform utilizes rapid amplification coupled with solid state nanopores to provide single molecule detection capability, enabling previously unattainable direct pathogen detection in environmental samples.

With an initial focus on the $23 million water quality monitoring market in California, Ross prepared a seven-year, forward-looking proforma for a successful enterprise and ROI for investors. His preparations included gathering market intelligence, examining regulatory pathways, determining technology approaches, investigating intellectual property issues, seeking potential business partners, outlining a corporate structure and defining funding needs.

“The PSM program, faculty, advisors and challenges helped bring ideas that I’ve been thinking about to something real on paper,” says Ross, who completed his MBt in May 2020. He also has a BS in Neurobiology, Physiology and Behavior from the University of California, Davis.

While Ross continues to work in the biotech industry, he now has both the scientific and business expertise to launch an entrepreneurial venture in water quality management when the time is right.

Contributed by Dr. Al Kern, Former Director and current Advisor of PSM Programs, California State University San Marcos.

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ALUMNI PROFILES (cont. from pg. 11)

MAHIN DAWOOD
PROFESSIONAL SCIENCE MASTERS: HEALTH CARE GENETICS UNIVERSITY OF CONNECTICUT, 2016

Using the PSM to Consider the Bigger Picture of Genetics in Healthcare

Mahin Dawood chose to attend UConn for the Health Care Genetics PSM because the degree was more than a lab approach; the PSM “encouraged me to consider the bigger picture when it came to genetics as well as healthcare.” A PSM made sense for me because while I completed in-depth scientific training, I also participated in seminars to improve scientific writing and presentation skills. We were encouraged in our discussions to consider ethical, legal, and social implications in every situation, and this is a concept that still remains with me.”

Mahin’s internship as a STEM Scholar Project Manager with UConn Honors was the most enjoyable component of her PSM degree whereas the difficult part was deciding on a direction since “you can tailor your plan of study, and the skills gained from the PSM are so widely transferrable that there is a variety of career options to consider.” Mahin’s first job post-PSM was as a research assistant at the Yale Cancer Genetics and Prevention Program where she managed a database of patients’ genetic variants and cancer diagnoses. Now as a clinical research coordinator at the Yale Center for Clinical Investigation, Mahin simultaneously manages up to fifteen pediatric genetic disease clinical trials.

Mahin’s parents’ accomplishments and support are a source of motivation as she expands her knowledge through online courses and seminar attendance. Mahin will start her doctoral studies in translational health sciences fall 2020 at the George Washington School of Medicine. Her goal is to become a clinical investigator with a research focus on genetic testing and screening for underserved populations. “I believe it is our duty as healthcare professionals to ensure every individual is represented fairly, receives the medical attention they need, and has access to the resources they require to live a long and healthy life.”

Submitted by Judy Brown, PhD, CG(ASCP)CM, MB(ASCP)CM, Director, Health Care Genetics Professional Science Masters Degree Program, Co-Director, Genetic Counseling Program, University of Connecticut, Institute for Systems Genomics.

NATHAN SWIFT
MASTER OF SCIENCE: PHYSICS, ENTREPRENEURSHIP TRACK CASE WESTERN RESERVE UNIVERSITY, 2016

Connecting Two Worlds: Using a PSM Degree to Bridge Physics and Entrepreneurship

While exploring graduate schools, Nate Swift found himself in a unique position. He had graduated college with a degree in Physics but had spent the last three years working in operations management for a major distribution center—no physics involved. “I missed the technical curiosity and challenges of the physics curriculum yet had also discovered my talent for business strategy and personnel development,” says Swift. “I didn’t want to walk away from either part of my still-early career.” Traditional graduate programs like MBAs or physics PhDs, however, would have required him to choose one path or the other.

That is, until a friend suggested he enroll in the Science Technology and Entrepreneurship Program (STEP) at Case Western Reserve University (CWRU), a unique program that trains physics, biotechnology, and chemistry students how to

(Continued on pg. 13)
ALUMNI PROFILES, NATHAN SWIFT (cont. from pg. 12)

to apply their technical skills within companies and technology startups. It would enable Swift to combine his passions while establishing himself as a rare asset to future employers. “It was the perfect fit for me. I continued to hone my scientific skills while simultaneously training in venture creation, innovation, entrepreneurial finance, and accounting.”

STEP culminates with students either interning for a relevant technical startup or launching their own venture. For his thesis, Swift co-founded Hedgemon, Inc. to develop a hedgehog-inspired impact protection technology invented at nearby University of Akron with initial focus on application as a safety liner for football helmets to reduce risk of concussion. “Without STEP—or CWRU in general—I don’t think Hedgemon would’ve gotten off the ground. My studies enabled me to bridge the gap between the team’s scientists and our business advisors while actively managing the company’s operations and finances. Otherwise, we were just a group of scientists with no idea how to build a company.” In addition to STEP, Swift attributes much of his success to CWRU’s other innovative entrepreneurial resources for students, such as the state-of-the-art Sears think[box] maker space and entrepreneurship center, aiding in fundraising and prototype development for the company, and the School of Law’s Intellectual Property Venture Clinic, which supported Hedgemon through its license agreement negotiations.

Since graduating in 2016, Swift went on to work for a couple other companies while continuing to fundraise and develop Hedgemon’s technology. Employers both large and small desperately need such diverse skillsets, even if they don’t know it yet. “I can communicate complex technical concepts with non-scientists or engineers; I can develop extremely detailed designs while maintaining an understanding of the big-picture needs and direction of the business; and I can write a scientific white paper or pitch a business strategy to a room full of investors.”

Degree programs like STEP play a vital role in developing the next generation of versatile scientists and engineers, equipping students for thrilling and rewarding careers. “My PSM got me here, and I have never looked back!”

Contributed by Ed Caner, Physics Lecturer and Director of Science, Technology, and Entrepreneurship Program (STEP) at Case Western Reserve University.

SAMANTHA HOLMES

PROFESSIONAL SCIENCE MASTERS: APPLIED GENOMICS
UNIVERSITY OF CONNECTICUT, 2018

FROM LAB BENCH TO REGULATORY AFFAIRS

In fall 2017, Samantha Holmes entered the M.S. Applied Genomics Professional Science Master’s (PSM) program in the Department of Molecular and Cell Biology (MCB) at the University of Connecticut with the intent of enhancing her hands-on experiences in the laboratory. Exposure to different career opportunities in the program led her to an internship and a career in regulatory affairs. Even with the change in direction, Samantha knew that the technical skills and knowledge acquired through the program would prepare her, and set her apart, from other candidates in the job market.

Prior to entering the MCB PSM program, Samantha had an internship at Alnylam, where she was part of the RNAi research discovery team. This was followed by an internship at Merrimack Pharmaceuticals, where she created and evaluated mouse models for various cancer cell lines.

After graduating with a M.S. in Applied Genomics in the summer of 2018, Samantha went to work at Blueprint Medicines as a Regulatory Affairs Associate. As Samantha notes, it was the MCB PSM professional development seminars and courses that prepared her for her current job. “The program prepared me well for the job market. The networking

(Continued on pg. 14)
ALUMNI PROFILES, SAMANTHA HOLMES (cont. from pg. 13)

from the professional development seminars was very useful as that is how I became familiar with Regulatory Affairs and their role in a pharmaceutical company. The coursework also gave me more advanced knowledge that is applicable to oncology and rare disease-based companies.”

At Blueprint Medicines in Cambridge, MA, Samantha works in different parts of the regulatory arena, preparing and submitting new drug applications, working on global regulatory submissions, submitting FDA amendments, rolling out new protocols, and organizing ongoing clinical trials.

Based on her experiences in the MCB PSM program, Samantha says, “I recommend the program to other students as it is a lab driven and industry focused program. The program not only offers labs and coursework, but also professional development seminars, interview/resume practice, and strategies for managing people, which are all just as important.”

Submitted by Elaine Mirkin, M.S., Director of Graduate Professional Education, Department of Molecular and Cell Biology, University of Connecticut.

PSM Certificate of Completion: Another Benefit of Membership

Affiliated PSM programs may request a PSM Certificate of Completion for their students. For Summer 2020 graduates, email (coordinator@npsma.org) an excel file with the list of names of your students, names of program director(s) or other program official(s) and dates to be shown on the certificate. We will electronically send completed certificates within 2-3 weeks.

PSM Alumni may also request certificates by filling out the request form for the PSM Certificate of Completion found at www.professionalsciencemasters.org/certificate-completion-form.

The PSM Alumni and Graduation CHRONICLE

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