



## Message From the Chair

Welcome to our first newsletter for the Division of Natural Sciences & Mathematics at LC State. I'm excited for my first year as chair. I look forward to being a part of a very active and exciting division. I'm also really excited to share all the great things that happen in our division. In this newsletter, you will read about the opportunities that some of our students experienced last summer, a couple success stories from past graduates, and some really great partnerships our faculty and students have made in our region. I will also share a little about the cool research that happens in our division. Note: Some of the stories shared here are written by those involved with the activities with little editing by me.

**Opportunities** This summer, several students in our division presented their research at local and national conferences. In this part of the newsletter, I want to highlight a few of these projects by sharing excerpts of what the students wrote. Not only did students enjoy their research opportunities, they found it to be an essential part of their education.

From the Division of Natural Sciences and Mathematics here at LC State, 10 students traveled to Boise for the annual Idaho Conference on Undergraduate Research, 11 students presented at the annual INBRE conference in Moscow, 3 presented at the American Society of Plant Biologists conference in San Jose, and 3 traveled to Cincinnati for the national Mathfest conference. The following are some of their experiences.

**Rhegan Humphrey**, a 2019 Biology graduate, is now preparing for medical school. At ICUR, she presented her joint research with **Dr. Leigh Latta** and current student **Kory Parker** on the antimicrobial properties of essential oils. Here is what Rhegan said of her experience.

"I began my research adventure, with Professor Leigh Latta, my sophomore year studying the antimicrobial properties of the essential oil *Arborvitae*. Over these past two years, I have gained confidence in myself, learned to share my findings with others, and experienced the process of preparing and submitting a manuscript for publication. I am forever thankful to Leigh for providing me the opportunity to become involved in research and for fueling my passion for continuous learning. Not only did I gain a very close group of peers, I also became a better student, scientist, and individual."

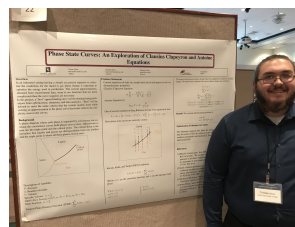
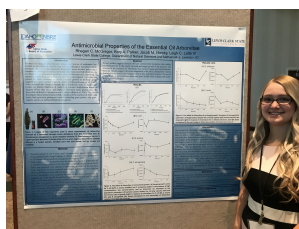
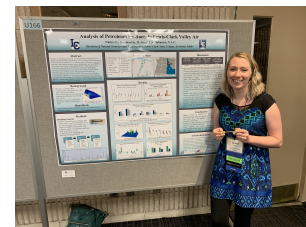
**Yuka Katsuki**, a computer science major, presented posters at both the INBRE and ASPB conferences. Her poster showed her joint work with **Dr. Charles Addo-Quaye**. Her poster, entitled "In silico characterization of plant microRNAs in large-scale natural variation studies," showed their work to create a "computational method for discovering neglected microRNA gene loci in large-scale natural variation studies."

**Laurel Nuñez**, a recent Biology graduate, worked in **Dr. Nancy Johnston's** Lab performing research on air-quality in the LC Valley. She presented, "Analysis of Petroleum Products in Lewis-Clark Valley Air" at the INBRE conference.

Her research was joint work with 2019 LC State graduate **Damien Ketcherside**, current student **Philip Scott**, and **Dr. Johnston**. In this work, they sought to better understand the source and concentrations of harmful automotive emissions in the LC Valley air. They found that, based on EPA standards, though the emission concentrations are high, they do not pose significant health risks. Here is what Laurel said about her experiences and how research benefited her. "I have developed many lab skills I did not gain from my courses. It helped me develop stronger problem solving skills by helping me determine which procedure in the lab was/is a priority over others. It also helped me develop better personal communication skills through teaching other students our laboratory procedures, collaborating with other researchers, and [presenting] individual and group research posters. I am very grateful for the travel opportunities I had due to my research. I had the opportunity to go to Washington, D.C. for an AGU conference and [I] traveled to McCall and Boise as part of NASA/NOAA FIREX-AQ. These opportunities made it possible for me to step outside of my comfort zone to talk, to other highly skilled researchers, and helped me appreciate what I have learned and what I have yet to learn. Additionally, student research has helped me learn that trouble shooting or constantly developing different hypotheses is a common part of research and it helps us become better researchers. It also helps us develop better procedures for more accurate future research."

**Tristan Olsen**, a senior double Mathematics/Chemistry major, presented at Mathfest and ICUR. At ICUR, he presented his HERC funded, joint work, with **Dr. Heather Moon** and WSU professor **Dr. Tom Asaki**, that connects Mathematical Optimization and Chemistry to create a model, that depends on physical properties, for the equilibrium curve between the liquid and gas phases of a compound. About his experiences, Tristan wrote,

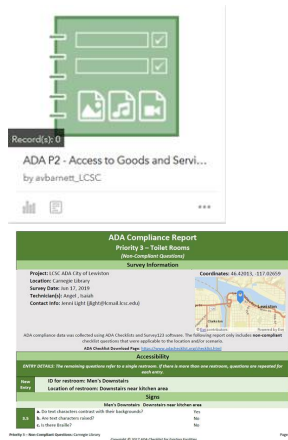
"MathFest and ICUR opened my eyes to research and sharing results. Previously, I thought that the only way to share these results with a large audience was to publish in a scientific journal. Seeing the wide range of student research at ICUR was interesting. A panel on careers in business, industry, and government showed that [industrial and government] jobs can be attained with all levels of education in mathematics. Learning about the partnering of mathematicians with jobs in industry was particularly interesting, as I was unaware of the process by which people find jobs in these areas. Overall the two conferences provided an insight into my future that I do not think would have been possible otherwise. They showed research that was interesting and sparked curiosity about subjects that I was unfamiliar with. The six days that I was away from Lewiston provided me with so many answers to [many new] questions."





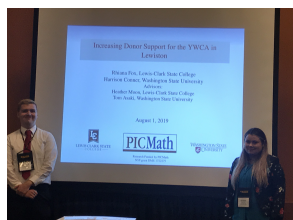
**Partnerships** Our faculty are also very active in creating partnerships with local and national agencies. In this section, I will highlight a few of these partnerships.

Engineering Professor, **Dr. Jenni Light** has ongoing partnerships with the Lewis-Clark Valley Metropolitan Planning Organization, City of Lewiston, and engineering firm TD&H. Jenni has created these partnerships offering students real-life engineering experience through different projects ranging from traffic counting (used for prioritizing and developing local transportation projects) to ADA compliance for municipalities. 2018 LC graduate **Angel Barnett** and current students **Owen Blair** and **Isaiah Linabary**



are getting experience developing proposals, project management, GIS and GIS app development, even developing smartphone data collection apps.

Associate professor of Mathematics and division chair, **Dr. Heather Moon** and her three research students, **Rhiana Fox**, **Tristan Olsen**, and **Rachel Sila**, teamed up with students from WSU to assist two local entities Lewiston YWCA and Nez-Perce Clearwater National Forest to create data analytics tools to answer real questions posed by these partners. Funding for the project came from the MAA and the NSA through the PICMath grant. For the NFS, students analyzed stream flow data to determine whether hydrologic events (such as wildfires, forest grooming, rain on snow events,...) can be detected in the stream flow. For the YWCA, students analyzed donation data to determine the effects of YWCA activities on donor retention. Work for these projects were presented at MAA Mathfest in Cincinnati.



Associate professor of Chemistry, **Dr. Nancy Johnston** and her team of five have been chasing smoke students after wildfires to collect air samples. Nancy and her team, **Laurel Nuñez**, **Philip Scott**, **Dylan Miller**, **Gabrielle Dickinson** and Parke Sutton (BYU student) began working under her newly awarded INBRE grant this past summer. “[They] are investigating wildfire smoke for various air

toxics, in partnership with NASA/NOAA’s FIREX-AQ,”



having ground sites in Boise, McCall, Lewiston,



Spokane and Missoula. Their main goal is to “determine the effects of air toxics in wildfire smoke on human health.” This exciting project has students actively engaged in field work along side professionals from NASA and NOAA!

**Successes** The above opportunities set our students up for success. In this section, I will highlight stories about summer internships and our graduates. **Damien Ketcherside** (chemistry) and **Rachel Sila** (math and engineering), 2019 graduates, are now pursuing graduate degrees. Damien is enrolled at University of Montana where he has continued research on projects similar to the air quality research he was involved in with **Dr. Nancy Johnston** and is pursuing a higher degree toward his goal for a career in academia. Rachel is enrolled at Washington State University working toward a PhD in applied mathematics. She is continuing work on projects similar to the optimization and image analysis projects that she began at LC State with **Dr. Heather Moon**.

Current students, **Jesse McDonald** and **Marco Batete** were give summer REU/internship opportunities. Jesse traveled to Texas A&M for an REU on computations for unmanned aerial systems. Marco was awarded an internship at NJY Camps where he was a Coding Specialist whose job was to teach kids to code in Swift.

**Scholarship** Our faculty stay active in their field. Over the summer, the DONSAM faculty presented at several regional and national conferences. Several publications were accepted this summer as well. **Dr. Lloyd Mataka** and collaborators published the article, “A Multistep Inquiry Approach to Improve Pre-Service Elementary Teachers’ Conceptual Understanding.” **Dr. Heather Moon** and collaborator published an article entitled, “Anisotropic Variation Formulas for Imaging Applications.”

**Dr. Charles Addo-Quaye** presented his work, “Improved mutation detection for plant gene function discovery.” at the ASPB conference in San Jose and at the INBRE conference in Moscow. **Suzanne Rousseau** presented her first conference talk up in Coeur d’Alene at the Great Idaho STEM Together conference. She presented her work, “Data Detectives: Statistics Introduction in Reverse.” Her presentation had faculty and teachers actively engaged by playing with data as they worked on a task made “to engage middle and high schoolers in statistics.” At the same conference, **Dr. Kacey Diemert** presented, “How Can a Learning Trajectory Help Us Connect Geometric Transformations with Functions in the Classroom?”

