

HEXAPOD HERALD

Vol. 31, No. 3

Entomology Department, University of Nebraska-Lincoln

August 2019

Welcome

Dr. Kyle Koch joined the Entomology Department last month as an assistant extension educator and insect diagnostician. Some of Kyle's responsibilities include developing and delivering educational programs and resources as an active participant of Nebraska Extension's statewide issue teams, and providing statewide, regional, and national leadership in developing rapid, innovative insect diagnostics. He also will train extension personnel, UNL students, faculty, staff, and other professionals in the new insect diagnostic technologies; lead and innovate Nebraska's identification, surveillance, and mapping of invasive and threatening arthropod species, especially those of economic importance. Kyle was a post-doctoral research associate at Texas A&M's AgriLife Research and Extension Center in Weslaco, TX for the past year and a half. Kyle is originally from Scottsbluff, NE, and received his M.S. degree in entomology in 2013, and his Ph.D. degree in entomology in 2017, both from UNL.

Dr. Débora Montezano joined the Entomology Department on August 15th as a post-doctoral research associate working with **Drs. Justin McMechan** and **Tom Hunt**. The primary focus of her research will be on a new identified pest of soybean, the soybean gall midge through field, greenhouse, and lab experiments. Déia received her Ph.D. degree in entomology from UNL this past May. Her M.S. degree was in biotechnology, and B.S. degree was in biological sciences, both from Caxias do Sul University (UCS) Brazil.

Dr. Lise Pingault joined **Dr. Joe Louis'** Lab as a postdoctoral research associate in July. Lise, originally from Beaumont, France, received her M.S. in Molecular and Cellular Biology from the University Pierre et Marie Curie (Paris, France) and her Ph.D. in Physiology and Molecular Genetics at the Blaise Pascal University (Clermont-Ferrand, France). Before joining Joe's lab, Lise was at UNL's Department of Agronomy and Horticulture for a year, where she focused her research on the characterization of the regulatory mechanisms controlling the expression of plant genes in response to biotic and abiotic stresses. In the Entomology Department, Lise will work on the regulation of sorghum transcriptome in response to aphid feeding.

Dr. Prince Zogli is a new postdoctoral research associate in **Dr. Joe Louis'** Lab. He obtained his M.S. in Plant Breeding and Genetics from the University of Ghana before moving to the University of Vermont for a Ph.D. in Molecular Plant Pathology. After one year at UNL's Department of Agronomy and Horticulture, where his research focused on functional characterization of soybean genes involved in nodulation using molecular, biochemical, microscopic and gene-editing methodologies, Prince will use his expertise in the Louis lab to uncover the molecular and biochemical basis of plant defense responses to aphids.

"I always had an interest in all forms of life, but particularly insects as they make up such a large portion of living organisms. As an undergraduate, I took an entomology class and discovered my passion for insects as well as the many career opportunities."

Dr. Kyle Koch

*Quote Courtesy of
UNL CropWatch*



Koch



Montezano



Pingault



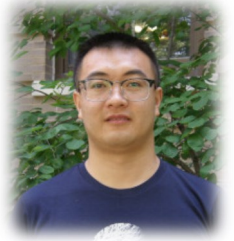
Zogli

Welcome con't.

Dr. Tobiasz Druciarek is a visiting scientist in **Dr. Gary Hein's** Vector Ecology Lab who is here for several months (July-Sept.). Dr. Druciarek is from Poland, and he obtained his Ph.D. from Warsaw University of Life Sciences in 2016, working on eriophyoid mites on roses. Since that time, he has been a postdoctoral research associate at the University of Arkansas-Fayetteville working on mite vectors of emaraviruses, particularly rose rosette virus. While here at UNL, he will be seeing how we work with a different eriophyoid mite-virus system and contributing his expertise on direct RT-PCR to a study on wheat curl mite-virus interactions.



Zuguo Guo is a graduate student from China Jiliang University with a double major in Biochemistry and Molecular Biology. He is currently being trained in **Dr. Jerry Zhu's** lab conducting collaborative research to understand the mechanisms underlining the stable fly olfaction as well as its related behavior. He is supported by a scholarship from QiMin Foundation of Jiliang University and will be in Lincoln through September. Zuguo loves science, philosophy, and literature. He also likes playing chess and outdoor activities including hiking.



Vilma Montenegro is a new master's student who will be working under the supervision of **Dr. Justin McMechan**. Vilma worked in the McMechan Lab over this summer as a research scholar with a field project that evaluated the timing of pyrethroid and organophosphate insecticides over the adult flight period of soybean gall midge. In addition, she will be conducting greenhouse experiments as part of her master's research to better understand soybean gall midge biology. Vilma is from Chiquimula, Guatemala and received her bachelor's degree in agricultural sciences and production in 2018, from Panamerican Agricultural University, Zamorano, located in Tegucigalpa, Honduras.



Sabrina Ongaratto joined **Dr. Tom Hunt's** program at the Haskell Ag Lab this summer and will be here through November. Sabrina is a Ph.D. student from **Dr. Edson Baldin's** lab at São Paulo State University, Botucatu, São Paulo, Brazil. Edson was a visiting scholar in the Entomology Department for a year beginning in September 2011. Sabrina has been working on soybean Lepidoptera pest movement and behavior. She is conducting field studies at the Haskell Ag Lab through August, at which time she will move to Lincoln and conduct more research with post-doc **Dr. Déia Montezano** in collaboration with **Dr. Ana Vélez**.



Emily Reinders is the new Research Technician in the **Dr. Lance Meinke** lab. She is originally from Maryland but is not new to the department, as she had worked previously in the Meinke lab and was also a UNL student. She will provide research support to the applied ecology/corn rootworm research program. Emily will serve as the lab manager, supervise undergraduate student employees, coordinate rootworm colony rearing, and participate in lab, greenhouse, and field experiments.



Otávio Silva Xavier also joined **Dr. Tom Hunt's** program at the Haskell Ag Lab this summer. Otávio is an undergraduate student advised by Drs. Gleina Costa and Flávio Gonçalves de Jesus from the Federal Institute of Goiano, Urutaí, Brazil. Flávio was a visiting scholar in our Department 2014-2015, and Gleina is Flávio's wife and a nematologist. Otávio is working on his senior project. He is involved with all of Tom's corn and soybean insect pest research, with emphasis on the soybean gall midge and Sabrina's soybean Lepidoptera project. He will be living in Wayne, Nebraska through November.



SAVE THE DATE—BUGFEST 2019, September 29, 2019, 1 - 4 p.m. Entomology Hall, East Campus, UNL

Welcome con't.

Online M.S. students for Fall 2019: **Elizabeth Bedford**, Clermont, FL; **Amy Catalano**, Rocky Point, NY; **Ryan Donovan**, Barrington, NS, Canada; **Devan Mazza-McDonald**, Mount Laurel, NJ; **Brian McMahon**, Dighton, MA; **Christine Melvin**, Goleta, CA; **Nicole Pruess**, Columbia, MO; **Jacob Root**, FPO, AE; **Julie Schwierking**, Gibsonia, PA.

New insect science major for this fall is: **Kyler Lawrenson**, Omaha, NE

Faculty News

Dr. Jeff Bradshaw was selected to be the editor of the “Field and Bench” department of the *American Entomologist* journal.

Dr. Louise Lynch-O’Brien’s new citizen science project “Tick Tag Go” is garnering attention from the media, with an article recently in the Omaha World Herald: https://www.omaha.com/livewellnebraska/unl-researchers-want-your-help-documenting-what-ticks-live-where/article_5ba53d12-b2cf-5560-832d-45a97038b205.html. Anyone interested in participating can contact Louise (llynchobrien@unl.edu) and check out her iNaturalist site: <https://www.inaturalist.org/projects/tick-tag-go>.

Dr. Matthew Smart was featured on the Faculty Spotlight in IANR News recently. You can read about Matt at <https://ianrnews.unl.edu/faculty-spotlight-matthew-smart>

Dr. Ana Vélez recently returned from China, where she made invited presentations on her RNAi research at the Second International Conference on Insect Pest Management.

Dr. Judy Wu-Smart received the Patriot Award from the Nebraska Army National Guard on July 9th as a symbol of gratitude for her efforts to support citizen warriors through a wide-range of measures including flexible schedules, time off prior to and after deployment, caring for families, and granting leaves of absence when needed. Judy is pictured below with Bee Lab member, **Courtney Brummel**, Bruce Wood, Major General (MG) Bohac, Command Sergeant Major (CSM) Baker, Command Sergeant Major (CSM) Hensen, and Master Sergeant (MSG) Nanfito.



Matt Smart with his bee beard



Ana with RNAi expert, Guy Smagghe



Brummel, Wood, Wu-Smart, Bohac, Baker, Hensen, Nanfito

U.S.-issued patents granted by the U.S. Patent and Trademark Office to the University of Nebraska-Lincoln Entomology Department inventors during the fiscal year that ended June 30, 2019.

Parental RNAi Suppression of Kruppel Gene to Control Hemipteran Pests—Kenneth Narva, Kanika Arora, Sarah Worden, **Blair Siegfried**, **Chitvan Khajuria**. Patent 10,047,374

Parental RNAi Suppression of Hunchback Gene to Control Hemipteran Pests—Kenneth Narva, Kanika Arora, Sarah Worden, **Blair Siegfried**, **Chitvan Khajuria**. Patent 10,047,360

Parental RNAi Suppression of Chromatin Remodeling Genes to Control Coleopteran Pests—Kenneth Narva, Kanika Arora, Sarah Worden, **Blair Siegfried**, **Chitvan Khajuria**. Patent 10,053,706

Publications

Fishilevich, Elane, Andrew J. Bowling, Meghan L.F. Frey, Po-Hao Wang, Wendy Lo, **Murugesan Rangasamy**, Sarah E. Worden, Heather E. Pence, Premchand Gandra, Shannon L. Whitlock, Greg Schu-lenberg, Eileen Knorr, Linda Tenbusch, Jamie R. Lutz, Stephen Novak, Ronda L. Hamm, Kari D. Schnelle, An-dreas Vilcinskis, and Kenneth E. Narva. 2019. RNAi targeting of rootworm *Troponin I* transcripts confers root protection in maize. *Ins. Biochem. Molec. Biol.* 104, 20-29.

Florez-Cuadros, Melina, Dennis Berkebile, Gary Brewer, and David B. Taylor. 2019. Effects of Diet Qual-ity and Temperature on Stable Fly (Diptera: Muscidae) Development. *Insects.* 10(7): 207. <https://doi.org/10.3390/insects10070207>

Inveninato Carmona, Gabriela, Jennifer Rees, Ron Seymour, **Robert Wright,** and **Anthony Justin McMechan.** 2019. Wheat Stem Maggot (Diptera: Chloropidae): An Emerging Pest of Cover Crop to Corn Transition Systems. *Plant Health Progress* 20: 147-154. <https://apsjournals.apsnet.org/doi/10.1094/PHP-01-19-0009-S>

Kirmse, Susan, and **Brett C. Ratcliffe.** 2019. Composition and host-use patterns of a scarab beetle (Coleoptera: Scarabaeidae) community inhabiting the canopy of a lowland tropical rainforest in southern Venezuela. *The Coleopterists Bulletin*, 73(1):149-167. <https://doi.org/10.1649/0010-065X-73.1.149>

Koch, Kyle G., Erin D. Scully, Nathan A. Palmer, Scott M. Geib, **Gautam Sarath, Tiffany Heng-Moss,** and **Jeffrey D. Bradshaw.** 2019. Divergent Switchgrass Cultivars Modify Cereal Aphid Transcriptomes. *Jour-nal of Economic Entomology*, 112(4): 1887–1901, <https://doi.org/10.1093/jee/toz053>

Montezano, Débora G., Thomas E. Hunt, Alexandre Specht, Priscila M. C. Luz and **Julie A. Peterson.** 2019. Life-History Parameters of *Striacosta albicosta* (Lepidoptera: Noctuidae) Under Laboratory Conditions. *Journal of Insect Science*, 19(4): 14; 1–8, <https://doi.org/10.1093/jisesa/iez073>

Pereira, Adriano E., Brigitte Tenhumberg, **Lance J. Meinke,** and **Blair Siegfried.** 2019. Southern corn root-worm adult emergence and population growth assessment after selection with *vATPase-A* dsRNA over multi-ple generations. *J. Econ. Entomol.* 112(3): 1354-1364. <https://doi.org/10.1093/jee/toz008>

Pezzini, Daniela T., Christina D. DiFonzo, Deborah L. Finke, **Thomas E. Hunt,** Janet J. Knodel, Christian H. Krupke, Brian McCornack, Andrew P. Michel, Christopher R. Phillips, Adam J. Varenhorst, **Robert J. Wright,** and Robert L. Koch. 2019. Community Composition, Abundance, and Phenology of Stink Bugs (Hemiptera: Pentatomidae) in Soybean in the North Central Region of the United States. *Journal of Economic Entomology*, 112(4): 1722–1731, <https://doi.org/10.1093/jee/toz099>

Ratcliffe, B. C. 2019. Keys to the genera of adult and larvae of 19 species of Gymnetini (Coleoptera: Scarabaeidae: Cetoniinae) in the New World with a species checklist and description of two new genera and species from Mexico and Martinique. *The Coleopterists Bulletin*, 73(1):1-26. <https://doi.org/10.1649/0010-065X-73.1.1>

Rault, Leslie C., Scott T. O'Neal, Ellis J. Johnson, and Troy D. Anderson. (2019) Association of age, sex, and pyrethroid resistance status on survival and cytochrome P450 gene expression in *Aedes aegypti* (L.). *Pes-ticide Biochemistry and Physiology*, 156: 96 - 104.

Souza, D., B. C. Vieira, B. K. Fritz, W.C. Hoffmann, J. A. Peterson, G. R. Kruger, and L. J. Meinke. 2019. Western corn rootworm pyrethroid resistance confirmed by aerial application simulations of commercial insecti-cides. *Sci. Rpts.* 9:6713 <https://doi.org/10.1038/s41598-019-43202-w>

Stilwell, Abby R., Donald C. Rundquist, David B. Marx, and **Gary L. Hein.** 2019. Differential Spatial Gra-dients of Wheat Streak Mosaic Virus into Winter Wheat from a Central Mite-Virus Source. *Plant Disease* 103: 338-344. <https://doi.org/10.1094/PDIS-01-18-0025-RE>

Tetreault, Hannah M., **Sajjan Grover,** Erin D. Scully, Tammy Gries, Nathan Palmer, **Gautam Sarath, Joe Louis** and Scott E. Sattler. 2019. Global responses of resistant and susceptible sorghum (*Sorghum bicolor*) to sugar-cane aphid (*Melanaphis sacchari*). *Frontiers in Plant Science*, <https://doi.org/10.3389/fpls.2019.00145>

Congratulations

Kayla Mollet receive her M.S. degree in August. Kayla worked under the supervision of **Dr. Judy Wu-Smart**. Her thesis was entitled, “Promoting Bee Communities through Habitat Enhancements on Public and Private Lands in Nebraska”. Kayla is now a research coordinator working with Dr. Mitchell Stevenson at the Panhandle Research and Extension Center in Scottsbluff, NE.

Erica Heidenreich received her bachelor’s degree in insect science on August 17, 2019. She has been living in Gastonia, NC, working at the Daniel Stowe Botanical Garden as an education instructor. Erica is originally from Mt. Pleasant, WI.

The following students, who also graduated August 17, 2019, were in the online masters degree program:

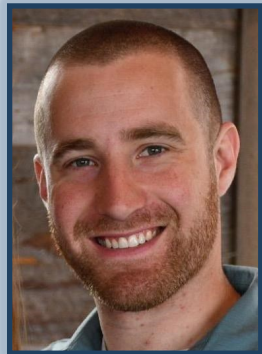
Eric Honerlaw works as a pest control professional and has plans to pursue an entomologist position in pest control or consulting. His master’s degree project title was “Midwest Pest Collection and Profiles”. Eric received his B.S. degree in biology from the University of Wisconsin-Steven’s Point. He lives in Ingleside, IL.

Patrick Salvatore Natale III will continue teaching biology at Mercer County Community in NJ using his degree to expand his role at the college. His passion is teaching about the natural world, and he hopes to create novel methodologies for awakening the naturalist in everyone. His master’s degree project was a card game that taught players basic insect taxonomy, identification and natural history. Patrick received his B.S. degree in plant science from Rutgers. He lives in Mercerville, NJ .

Elizabeth Sorensen has worked at Jubilant HollisterStier (JHS) for the past 7 years. JHS makes allergy immunotherapies (in addition to many other things). She is in the QA Incoming Biologicals group and is already using her degree for inspection of 11 species of wasps and 2 species of *Solenopsis* ants. Her master’s degree project was “What’s Bugging You” an app that helps you identify insects to Order (<https://sorensen.github.io/dichotomous-key/#>) Liza says all of the knowledge she’s gained through UNL’s online master’s degree program has enriched both her personal and professional life, and she’s very proud to be a graduate of UNL!



Heidenreich



Honerlaw



Natale III



Sorensen

Student News

Kait Chapman and **Bridget Gross** are the inaugural recipients of the Charles Glenn Murphy Memorial Fellowship in the amount of \$1,467 each. This scholarship was established by Charlie’s parents, Cameron and Jenna Murphy, to honor the life of their son and is in recognition of Kait and Bridget’s scholastic records and outstanding participation in outreach and science literacy events.

Bridget Gross was accepted to the USAID-funded Farmer-to-Farmer (F2F) program and was in Dajabon, Dominican Republic for two weeks in early August. F2F promotes economic development and food security abroad by sending volunteer technical specialists from the U.S. to Latin America to provide technical assistance to producers, cooperatives, agribusinesses, NGOs, and educational institutions. Bridget helped improve honey producers’ record keeping and management practices. Many of the beekeepers do not keep good records of their honey production or hive health. The goal was to provide beekeepers with better ways of tracking and managing their hives.



Student News con't.

Sajjan Grover was selected to receive a Wirth/McGowen Memorial Scholarship from the College of Agricultural Sciences and Natural Resources (CASNR), which includes a \$3,500 stipend. He also was awarded the Dean's Fellowship in the amount of \$5,000 from the Office of Graduate Studies and the Fred Clute Memorial Fellowship, established by Roland and Winona Rhodes, in the amount of \$1,074.

Gabriela Inveninato Carmona was awarded the Dean's Fellowship from the Office of Graduate Studies for the 2019-2020 academic year, in the amount of \$5,000.

Ellis Johnson received a travel award of \$845 to attend the 2019 American Chemical Society (ACS) National Meeting & Expo in San Diego, CA, August 25 - 29, where he will give a poster presentation. Ellis also received \$200 to travel to San Juan, Puerto Rico to participate in the student symposium at the 49th Annual Society for Vector Ecology (SOVE) Conference, September 22 - 26, 2019.

Annie Krueger is the inaugural recipient of the Dr. Ron Johnson and Dr. Mary Beck Graduate Student Fellowship for Nature Conservation. The award includes a \$1,250 stipend for the 2019-2020 academic year.

Jen Williams received a travel award of \$845 to attend the 2019 American Chemical Society (ACS) National Meeting & Expo in San Diego, CA, August 25 - 29, where she will give a poster presentation.

The Bruner Club was awarded the UNL Graduate Student Assembly Special Projects Grant of \$800 (requiring an additional 25% match from the club) for a post-graduate professional development workshop series that will be held this fall. The Education Committee (**Lindsay Overmyer, Jordy Reinders, Matt Welter, Annie Krueger, Bethany Thomas, Gabi Carmona, and Kait Chapman**) put together the grant proposal.

Karen Da Silva, Ph.D. student in Agronomy and Horticulture, (co-mentored by Drs. Sydney Everhart and **Joe Louis**) was named the 2019 recipient of the L.E. Melhus Graduate Student Symposium Award from the American Phytopathological Society (APS).

Earl Agpawa has been awarded the Warren and Una Emerson Memorial Scholarship and received a scholarship from the Insect Science Scholarship Fund for the 2019-2020 academic year. **Courtney Wallner** has received the Ephriam and Veallon Hixon Memorial Scholarship. **Braden Wojahn** was awarded a scholarship from the Earl & Bertha Ramsey Memorial Fund.

Dr. Scott O'Neal and Dr. Leslie Rault are finalists for the New Investigator Award in the AGRO Division of the 2019 ACS Meeting and Expo in San Diego, CA.

Grants

Douglas Golick, Jenny Keshwani, Tom Weissling

Nebraska Environmental Trust \$ 17,835
"Milkweed in the Classroom"

Douglas Golick, Xerces Society

Nebraska Environmental Trust \$ 40,443
"The Nebraska Bumble Bee Atlas"

Douglas Golick, Troy Anderson, Gary Brewer, Jenny Dauer, Joe Louis, Justin McMechan, Julie Peterson, Matthew Smart, Tom Weissling, Ana Vélez, Judy Wu-Smart

USDA-NIFA
"Building Undergraduate Research and Science Communication Skills Through Beneficial Insects Protection Research and Extension Experiences (FACT) \$344,767

Joe Louis

Crop Enhancement
"Analysis of Aphid Feeding on CropCoat via Electrical Penetration Graph" \$ 26,280



Research and Extension Experience

The Entomology Department's inaugural 10 week NIFA-funded Beneficial Insects Research and Extension Experiences for Undergraduates (REEU) program successfully concluded in mid-August with a departmental poster competition, university poster competition, and a banquet. The REEU Program is focused on promoting research and extension experiential learning for undergraduates such that upon graduation they may enter the agriculture workforce with exceptional skills. This program provides funding for travel to and from Lincoln, housing and meals, and a stipend during the summer experience. Over 70 students applied for the NIFA-funded REEU program in Entomology, and 5 were selected: Xavier Mack from Penn State University, mentored by **Dr. Doug Golick**, Dr. Jenny Dauer, and Citlally Jimenez, graduate student in the UNL School of Natural Resources; Haley Moyer from Lock Haven University, mentored by **Dr. Troy Anderson**, and graduate students **Annie Krueger** and **Jen Williams**; Malya Price from Norfolk State University, mentored by **Drs. Tom Weissling** and **Ana Vélez**; Erica Maul from Wellesley College, mentored by **Dr. Matt Smart**; and Pauline Yoo from Oral Roberts University, mentored by **Dr. Judy Wu-Smart**. **Dr. Joe Louis** brought in two additional students as part of his NSF Early Career Award - Adryenna Perez and Juan Vaca - from the University of Texas-Rio-Grande-Valley. Graduate student **Sajjan Grover** also assisted in mentoring these two students. Malya Price won the departmental poster competition and will receive \$600 to support her attendance at a professional meeting. The students had a wonderful educational experience, and their mentors also enjoyed having the students here. We look forward to three more summers of research and extension experiences for 33 undergraduate students <https://www.unl.edu/summerprogram/insects>



L-r, Brewer, Grover, Yoo, Moyer, Mack, Vaca, Perez, Louis, Golick, Price, Maul

Fall Entomology Department Meetings

Friday, September 20
Friday, October 18
Friday, November 8
Friday, December 13

Room 110, 1:30 p.m., Zoom provided

Insects and Murder

It's 1977 at Hardy Industries. Dr. John Morehead, a renowned scientist, has gone missing! He was working on an innovative adhesive product based on the silk from caddisflies. It's up to you to solve the mystery, uncover secrets, and determine what really happened to Dr. Morehead.

Thus began the introduction to a fun, educational murder mystery game created by graduate student **Justine LaViolette**. Working on the game as an Independent Study project with **Erin Bauer**, this murder mystery was an eight person “live action Clue” game, which was interactive and included a complex set of puzzles and clues. An entomological component about two scientists working on different research—caddisfly silk and wasp venom—was included as part of the storyline, as well as being used to solve one of the puzzles. Due to some adult themes, the game is geared toward ages 18+, and would work especially well with college audiences.

LaViolette and Bauer ran pilot runs of the game with four different groups of participants in early May. Players included Bugmasters, Master Gardeners, and staff, students, or faculty from Entomology, Agronomy/ Horticulture, and Forensic Science. In many cases, players had never been exposed to this type of game before. After each game, players filled out evaluation forms and provided feedback about aspects that worked well or needed improvement. From this, Justine and Erin were then able to adjust the game before each new group of participants played it, improving upon each pilot as the week progressed. Evaluations also indicated that people really enjoyed the experience!

After a few more additions and embellishments, including integrating educational concepts in other parts of the game, LaViolette and Bauer plan to offer the game online for a nominal fee, which will provide funding for other science communication projects in the department.



Murder Mystery Group 2 - l-r, back, J. Green, A. Thomas, S. Brummel, C. Brummel, K. Reiswig, P. Spitzer, S. Mack; l-r front, J. LaViolette, S. Mack, and E. Bauer



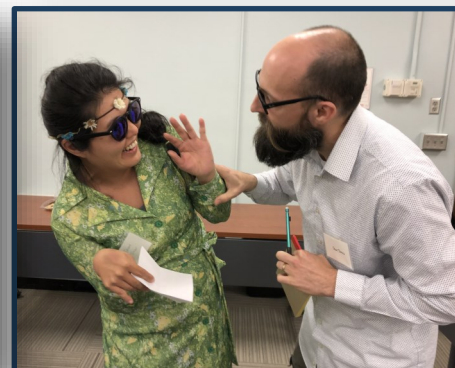
Murder Mystery Group 2— working on figuring out who done it!



Murder mystery coordinators— Erin Bauer, Justine LaViolette



Detective Drew (Louise Lynch-O'Brien) interrogates Dr. Stevenson (Sajjan Grover).



Debbie Glaser (Judy Wu-Smart) receives shocking news from Sam Jones (Matt Smart)