

Submissions 2021

| BIOLOGY | |
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| | --BIO: Ecology, Conservation and Wildlife-- |
| 1 | ANATOXIN-A DETECTION IN SPRINGFIELD WATER SYSTEMS <u>Madoch Jamroch, Allison Scott, John Kincaid.</u> Faculty Advisor: Babur Mirza |
| 2 | BIOMONITORING OF SPRINGFIELD URBAN STREAMS <u>Julianna Kolf, Alexis Reifsteck.</u> Faculty Advisor: Debra Finn |
| 3 | RELATIONSHIPS BETWEEN PRIMARY PRODUCTIVITY, PRECIPITATION, AND PHENOLOGY IN AN OZARK OAK/HICKORY WOODLAND <u>Grace Hall.</u> Faculty Advisor: Alexander Wait |
| 4 | GIZZARD SHAD HABITAT USE IN THE UPPER MISSISSIPPI RIVER <u>Alida M. Johnson, Elaine A, Ewigman, Hae H. Kim.</u> Faculty Advisor: Quinton Phelps |
| 5 | LANDSCAPE ECOLOGY OF PRAIRIE PATCHES IN SOUTHERN MISSOURI <u>Emilyn Gilmore, Morgan Rodery.</u> Faculty Advisor: Sean Maher |
| 6 | TESTING THE ACOUSTIC ADAPTATION HYPOTHESIS IN SONGS OF ARTISORNIS TAILORBIRDS <u>Shelby Palmer, Tricia Blankenship, Gabriel Jamie, Samuel Jones, Norbert Cordeiro, Elia Mulungu.</u> Faculty Advisor: Jay McEntee |
| 7 | IDENTIFYING POTENTIAL INTERACTIONS THAT MEDIATE THE DISTRIBUTIONS OF <i>NEOTAMIAS</i> IN THE WESTERN UNITED STATES <u>Paige Harman, Kayce C. Bell.</u> Faculty Advisor: Sean Maher |
| 8 | YELLOW PERCH POPULATION DYNAMICS AND SIMULATION MODELING IN THE UPPER MISSISSIPPI RIVER <u>Zachary Cockrum, Kylie Sterling, Elaine Ewigman, Hae Kim.</u> Faculty Advisor: Quinton Phelps |
| 9 | DO OZARK NATIVE DUCKWEED SPECIES STAND A CHANCE AGAINST NON-NATIVE <i>LANDOLTIA PUNCTATA</i> IN AMMONIA POLLUTED WATERS? <u>Abigail Giering.</u> Faculty Advisor: La Toya Kissoon-Charles |

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| 10 | POPULATION STRUCTURE OF LARGEMOUTH BASS IN THE UPPER MISSISSIPPI RIVER <u>Grant Schmitz</u> , Kylie Sterling, Elaine Ewigman, Aaron Muehler, Hae Kim. Faculty Advisor: Quinton Phelps |
| 11 | TEMPERATURE REGIMES IN OZARK STREAMS <u>Arthur Ludwig</u> . Faculty Advisor: Debra Finn |
| 12 | FEASIBILITY OF AGEING AND APPLICATION TO CYPRINID PREY SPECIES IN THE UPPER MISSISSIPPI RIVER <u>Chase Forck</u> , Grant Schmitz, Elaine Ewigman, Colby Gainer, Ethan Rutledge, Hae Kim. Faculty Advisor: Quinton Phelps |
| | --BIO: Cellular, Microbiology and Genetics-- |
| 13 | A LOOK AT CHITOSAN DERIVATIVES AND HOW THEY COULD POTENTIALLY BE APPLIED IN BIOMEDICAL BODY PROCESSES <u>Madeline Merrill</u> , Victoria Davenport. Faculty Advisor: Kyoungtae Kim |
| 14 | NANOPARTICLE EFFECTS ON HUMAN THYROID CANCER CELLS (ML-1) <u>Alyse Peters</u> . Faculty Advisor: Kyoungtae Kim |
| 15 | KINETIC ANALYSIS OF CADMIUM QUANTUM DOT'S TRAFFIC <u>Nhi Le</u> , <u>Cameron Kirk</u> . Faculty Advisor: Kyoungtae Kim |
| 16 | CHLOROPHYLL CONCENTRATION AND CARBON ASSIMILATION RATE ARE SENSITIVE INDICATORS OF NANOSILVER TOXICITY IN <i>ARABIDOPSIS THALIANA</i> <u>Margaret White</u> , Natalie Smith, Vincent Mays. Faculty Advisor: Laszlo Kovacs and Alexander Wait |
| 17 | CARBARYL SENSITIVITY IN GRAPEVINE <u>Courtney Duncan</u> , Courtney Coleman, Danielle Evilsizor. Faculty Advisor: Laszlo Kovacs |
| 18 | INVESTIGATING THE POTENTIAL TOXICITY OF ENGINEERED NANOMATERIALS ON <i>SACCHAROMYCES CEREVISIAE</i> <u>Kathryn Monahan</u> , Cullen Horstmann. Faculty Advisor: Kyoungtae Kim |
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| 19 | <p>MODULATION OF GABAergic SIGNALING IN PRIMARY TRIGEMINAL NEURONS AND GLIA BY A PROANTHOCYANIN-ENRICHED GRAPE SEED EXTRACT <u>Sophia Antonopoulos</u>. Faculty Advisor: Paul Durham</p> |
| 20 | <p>VARIATION IN BUDBREAK BEHAVIOR IN GRAPEVINE <u>Elias Ascencio</u>, Courtney Coleman, Sujana Thapa. Faculty Advisor: Laszlo Kovacs</p> |
| 21 | <p>IDENTIFICATION OF THE TERATOGENIC AND TOXIC EFFECTS OF THE HERBICIDES HEXAZINONE, MECOPROP, AND THIFENSULFURON-METHYL ON ZEBRAFISH EMBRYONIC DEVELOPMENT AND SURVIVAL <u>Dailyn Jones</u>, Kayla King, Aimee Aubuchon, Kyla Jackson. Faculty Advisor: Ryan Udan</p> |
| | CHEMISTRY |
| 1 | <p>METABOLOMICS REVEALS CHANGES IN NUTRITIONAL QUALITY OF WHEAT (<i>TRITICUM AESTIVUM</i>) EXPOSED TO PERFLUOROOCCTANESULFONIC ACID (PFOS) <u>Ian Sayers</u>, Polycarp Ofoegbu, Dane Wagner. Faculty Advisor: Cyren Rico</p> |
| 2 | <p>KINETICS AND THERMODYNAMICS OF BI-BII CONFORMATIONAL STATES IN T:G MISMATCHES <u>Collin Johnson</u>, Megan Westwood. Faculty Advisor: Gary Meints</p> |
| 3 | <p>COMPUTATIONAL STUDY ON STRUCTURE OF IR SPECTRAL LIBRARY USING CLUSTER ANALYSIS <u>Giselle Campos</u>, <u>Samuel Nack</u>. Faculty Advisors: Razib Iqbal and Keiichi Yoshimatsu</p> |
| 4 | <p>SYNTHESIS OF TUNABLE MESOPOROUS ZnO NANOPARTICLES FOR BIOLOGICAL APPLICATIONS <u>Daniel Padilla</u>. Faculty Advisor: Adam Wanekaya</p> |
| 5 | <p>SYNTHESIS AND CHARACTERIZATION OF OXIMATES OF Pt-GROUP METALS <u>Mikala Meadows</u>. Faculty Advisor: Nick Gerasimchuk</p> |
| 6 | <p>GROWTH AND CHLOROPHYLL CONTENT OF WHEAT (<i>TRITICUM AESTIVUM</i>) EXPOSED TO PERFLUOROOCCTANESULFONIC ACID (PFOS) IN HYDROPONIC SOLUTION <u>Eden Kohn</u>, Dane Wagner, Zachary Dobbs, Ian Sayers, Jackson Glover. Faculty Advisor: Cyren Rico</p> |

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| 7 | ¹H SOLUTION NMR ANALYSIS OF AN 8MER NON-PALINDROMIC DNA SEQUENCE CONTAINING A U:G MISMATCH <u>Autumn Pilarski</u> . Faculty Advisor: Gary Meints |
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| 8 | INVESTIGATION OF INCLUSION OF SILVER AND PALLADIUM NANOPARTICLES IN DRINKING WATER OF MALE AND FEMALE RATS ON DEVELOPING OFFSPRING <u>Camron Satterfield</u> . Faculty Advisor: Paul Durham |
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| 9 | SHORT EXPOSURE STUDY OF WHEAT TO PERFLUORONCTANESULFONIC ACID: A LABORATORY-BASED UNDERGRADUATE RESEARCH EXPERIENCE <u>Jackson Glover</u> , Preston Clubb, Lauryn Corbell, Andrew Coulliette, Carson Dumstorff, Mara Rydland, Catherine Smith, Trinity Takahashi, Dane Wagner. Faculty Advisor: Cyren Rico |
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| 10 | USE OF SITE-DIRECTED MUTAGENESIS TO INCORPORATE TWO CLINICAL MUTATIONS OF CYP4V2, T325I AND H331P, THAT CAUSE BIETTI'S CRYSTALLINE CORNEORETINAL DYSTROPHY (BCD) INTO CYP4V2 <u>Trieu Nguyen</u> . Faculty Advisor: Natasha DeVore |
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| | COOPERATIVE ENGINEERING |
| 1 | SELF-SUSTAINING IRRIGATION SYSTEM <u>Ryan Reed, Jack Nelson, Aniesa Parrigon</u> . Faculty Advisor: Tayo Obafemi-Ajayi |
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| 2 | PARALLEL GRIPPER ROBOTIC ARM DEMONSTRATING POSITION CONTROL SYSTEMS FOR DC MOTORS <u>Paul Brugh, Logan Bates, Hunter Matthews, Casey Ratliff</u> . Faculty Advisor: David Bates |
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| 3 | WIRELESS POWER TRANSFER <u>James Turk, Jacob Reed, Andrew Stoyeff</u> . Faculty Advisor: Theresa Odun-Ayo |
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| 4 | UNDERSTANDING THE BASICS OF POWER FACTOR CORRECTION <u>Curtis Brumfield, Kyle Doran, Logan Reed, Benjamin Hynes</u> . Faculty Advisor: Tayo Obafemi-Ajayi |
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| 5 | <p>CONTACTLESS LEVEL ACQUISITION AND MONITORING SYSTEM (CLAMS) <u>Dominic Zucchini, Tyler Tracy, Cassidy Johnson, Whitney Vermillion.</u> Faculty Advisors: Doug Carroll and Matt Pierson</p> |
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| | GEOGRAPHY, GEOLOGY AND PLANNING |
| 1 | <p>TEMPERATURE AND DISCHARGE MONITORING OF SPRINGS AND STREAMS TO APPROXIMATE WATER DRAINAGE BASINS IN THE SPRINGFIELD PLATEAU, MISSOURI <u>Dorian DeHart.</u> Faculty Advisor: Doug Gouzie</p> |
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| 2 | <p>YOUR PERSONAL TOUR THROUGH DUBLIN, IRELAND <u>Kara Smith.</u> Faculty Advisor: Krista Evans</p> |
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| 3 | <p>WATER QUALITY ANALYSIS OF THE SPRINGFIELD PLATEAU AQUIFER <u>Ramona Gomez.</u> Faculty Advisor: Melida Gutierrez</p> |
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| 4 | <p>PLAGIOCLASE ZONING AS AN INDICATOR OF MAGMA PROCESSES AT SAN PEDRO VOLCANO, CENTRAL VOLCANIC ZONE, CHILE <u>Brianna Williams, Drew Laviado-Garmon.</u> Faculty Advisor: Gary Michelfelder</p> |
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| | HOSPITALITY LEADERSHIP |
| 1 | <p>TOURISTS' PERCEPTIONS OF DESTINATION AND ITS PRODUCTS: THE CASE OF ITALY <u>Courtney Roberts, Elijah Sellers, Mara Presot, Bethany Osheim.</u> Faculty Advisor: Nancy Kageyama</p> |
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| | MATHEMATICS |
| 1 | <p>USING MATHEMATICAL ARGUMENTS AS A TOOL TO DEVELOP CONCEPTUAL UNDERSTANDING IN A DEVELOPMENTAL MATHEMATICS CLASS <u>Rachel Heili.</u> Faculty Advisor: Patrick Sullivan</p> |
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| 2 | <p>MIXED ERDOS TYPE POINT CONFIGURATION ESTIMATES <u>Fiona Wu, Slade Gunter, Hung Nguyen.</u> Faculty Advisor: Steven Senger</p> |
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| | PHYSICS, ASTRONOMY AND MATERIALS SCIENCE |
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| 1 | FREE-STANDING LIQUID MEMBRANES AS A NON-FOULING FILTER FOR THE REMOVAL OF MICRO-PLASTICS FROM WATER <u>Daniel Amuedo</u> . Faculty Advisor: Tiglet Besara |
| 2 | ESTIMATES OF ATMOSPHERIC JEANS ESCAPE ON TERRESTRIAL EARTH-LIKE EXOMOONS AROUND JUPITER-LIKE EXOPLANETS <u>Cory Padgett</u> . Faculty Advisor: Sarah Morrison |
| 3 | THE INFLUENCE OF OUTER JUPITER-LIKE PLANETS ON THE FORMATION OF INNER SUPER EARTHS IN RESONANT CHAINS <u>Mateo Guerra Toro</u> . Faculty Advisor: Sarah Morrison |
| 4 | PROBING NANO-BIO INTERACTION USING RAMAN SPECTROSCOPY <u>Jessica Fink</u> , Bishwajite Karmakar. Faculty Advisor: Kartik Ghosh |
| 5 | SOLAR CELL <u>Jacob Berry</u> , Rifat Shams. Faculty Advisor: Kartik Ghosh |
| 6 | ARTIFICIAL INTELLIGENCE FOR DEFECT EXAMINATION (AIDE) <u>Tyler McGilvry-James</u> , Justin Freses. Faculty Advisors: Sheryl Brahn and Ridwan Sakidja |