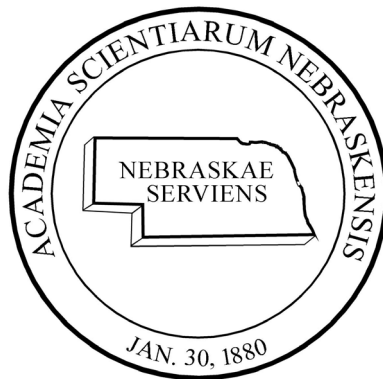


PROGRAM

THE NEBRASKA ACADEMY OF SCIENCES

1880-2019

Including the
Nebraska Association of Teachers of Science
(NATS) Division
Nebraska Junior Academy of Sciences
(NJAS) Affiliate
and
Affiliated Societies



139th Anniversary Year

One Hundred-Twenty-Ninth Annual Meeting

April 12, 2019
NEBRASKA WESLEYAN UNIVERSITY
LINCOLN, NEBRASKA

THE NEBRASKA ACADEMY OF SCIENCES, INC.

302 Morrill Hall, 14th & U Streets

Lincoln, Nebraska 68588-0339

neacadsci.org

Affiliated with the American Association for the Advancement of Science

And

National Association of Academies of Science

GENERAL INFORMATION

The Nebraska Academy of Sciences was organized on January 30, 1880 with monthly scheduled meetings in Omaha, Nebraska. The Academy was reorganized on January 1, 1891 and annual meetings have been held thereafter.

AUTHORS ARE INVITED TO SUBMIT MANUSCRIPTS OF THEIR WORK FOR PUBLICATION IN THE TRANSACTIONS OF THE NEBRASKA ACADEMY OF SCIENCES, a technical journal published periodically by the Academy for 47 years.

Articles in all areas of science, science education, and history of science are welcomed, including results of original research as well as reviews and syntheses of knowledge.

The *Transactions* has moved to a digital format and is available to anyone through the Digital Commons at the University of Nebraska–Lincoln. It is abstracted by major abstracting services as well.

Manuscripts should be submitted via the online submission system at

<http://digitalcommons.unl.edu/tnas/guidelines.html> using the Submit your paper or article link

PROGRAM AT-A-GLANCE

FRIDAY, APRIL 12, 2019

- 7:30 a.m. REGISTRATION OPENS - Lobby of Lecture Wing, Olin Hall
- 8:00 Aeronautics and Space Science, *Session A* – Acklie 109
Aeronautics and Space Science, *Session B* – Acklie 111
Collegiate Academy; Biology, *Session B* - Olin B
Biological and Medical Sciences, *Session A* - Olin 112
Biological and Medical Sciences, *Session B* - Smith Callen Conference Center
Chemistry and Physics; Chemistry - Olin A
- 8:00 “Teaching and Learning the Dynamics of Cellular Respiration Using Interactive Computer Simulations”
Workshop – Olin 110
- 9:30 “Life After College: Building Your Resume for the Future” Workshop – Acklie 218
- 8:25 Collegiate Academy; Chemistry and Physics, *Session A* – Acklie 007
- 8:36 Collegiate Academy; Biology, *Session A* - Olin 111
- 9:00 Chemistry and Physics; Physics – Acklie 320
- 9:10 Aeronautics and Space Science, *Poster Session* – Acklie 109 & 111
- 10:30 Aeronautics and Space Science, *Poster Session* – Acklie 109 & 111
- 11:00 MAIBEN MEMORIAL LECTURE: *Dr David Swanson* - OLIN B
Scholarship and Friend of Science Award announcements
- 12:00 p.m. LUNCH – WESLEYAN CAFETERIA
Round-Table Discussion – “Assessing the Academy: Current Issues and Avenues for Growth” led by
Todd Young – Sunflower Room
- 12:50 Anthropology – Acklie 109
- 1:00 Applied Science and Technology - Olin 111
Biological and Medical Sciences, *Session C* - Olin 112
Biological and Medical Sciences, *Session D* - Smith Callen Conference Center
Chemistry and Physics; Chemistry - Olin A
Collegiate Academy; Biology, *Session B* - Olin B
Earth Science – Acklie 007
Environmental Sciences – Acklie 111
Teaching of Science and Math – Acklie 218
- 1:20 Chemistry and Physics; Physics – Acklie 320
- 4:30 BUSINESS MEETING - OLIN B

AWARDS PRESENTATIONS/MAIBEN LECTURE

11:00 A.M.

Olin B

NEBRASKA ACADEMY OF SCIENCES SCHOLARSHIP WINNERS

Collegiate and High School Scholarships Presented by Mary Ettel, Wayne State College

UNMC BIOLOGY/BIOMEDICAL SCIENCES RESEARCH PRESENTATION AWARDS

NEBRASKA GEOLOGICAL SOCIETY EARTH SCIENCE AWARD

To be Announced Later in the Day

FRIEND OF SCIENCE AWARDS

Presented by Todd Young,
President, NAS, Wayne State College

MAIBEN LECTURER

Dr. David Swanson
University of Nebraska–Lincoln

*For papers with more than one author, an asterisk follows the name of the author(s) who plans to present the paper at the meeting.

AERONAUTICS AND SPACE SCIENCE

Chairperson: Scott E. Tarry

NASA Nebraska Space Grant & EPSCoR, University of Nebraska at Omaha

SESSION A

Acklie Hall Room 109

- 8:00 1. ENHANCED ULTRASONIC CHARACTERIZATION OF METAL ADDITIVELY MANUFACTURED PARTS USING HYBRID CAPABILITIES. Luz D. Sotelo*, Michael Sealy, Cody Kanger, Rakesh Kumar, Joseph A. Turner, Department of Mechanical and Materials Engineering, University of Nebraska – Lincoln.
- 8:10 2. VOXEL IMAGE FORMATIONS USING SUPERIMPOSED LASER BEAMS. Auston Viotto, Department of Mechanical & Materials Engineering, University of Nebraska Lincoln.
- 8:20 3. HIGH EMISSIVITY SURFACES PRODUCED USING FEMTOSECOND LASER SURFACE PROCESSING FOR THERMAL MANAGEMENT OF SATELLITES. Andrew Reicks*, Alfred Tsubaki, Dennis Alexander, and Craig Zuhlke, Department of Electrical and Computer Engineering, Jace Wieseler, Edwin Peng, Mark Anderson, and George Gogos, Department of Mechanical and Materials Engineering, University of Nebraska- Lincoln.
- 8:30 4. EXPERIMENTAL INVESTIGATION OF TWO-DIMENSIONAL DROP COALESCENCE IN LIQUID-AIR SYSTEMS. Jacob Gottberg*, Haipeng Zhang, and Sangjin Ryu, Department of Mechanical and Materials Engineering, University of Nebraska-Lincoln.
- 8:40 5. FLUID DYNAMICS OF TWO-DIMENSIONAL LIQUID PINCH-OFF. Stephanie Vavra*, Haipeng Zhang, and Sangjin Ryu, Department of Materials and Mechanical Engineering, Charles Riedesel, Department of Computer Science and Engineering, University of Nebraska-Lincoln.
- 8:50 6. SPARK PLASMA SINTERING FOR ISRU-ORIENTED LUNAR SIMULANT SOLIDIFICATION. Xiang Zhang and Bai Cui, Department of Mechanical and Materials Engineering, Mahdiah Khedmati and Yong-Rak Kim*, Department of Civil Engineering, University of Nebraska-Lincoln.
- 9:00 7. CONVERSION OF CALCIUM CARBONATE INTO METHANE AND MULTI-CARBON COMPOUNDS BY A NOVEL MICROBIAL CONSORTIUM. Nicole A. Fiore*, Rebecca V. Kiat, Donald Pan, Caitlin Lahey and Karrie A. Weber, School of Biological Sciences, Nicole R. Buan, Department of Biochemistry, University of Nebraska-Lincoln, Rebecca A. Daly and Kelly C. Wrighton, Department of Crop and Soil Sciences, Colorado State University, Fort Collins.
- 9:10 BREAK/POSTER PRESENTATIONS – Acklie 109 & 111
- 9:30 8. RECIPROCAL FOREARM FLEXION-EXTENSION RESISTANCE TRAINING ELICITS COMPARABLE INCREASES IN MUSCLE STRENGTH AND SIZE WITH AND WITHOUT BLOOD FLOW RESTRICTION. Ethan Hill*, Terry Housh, Joshua Keller, Cory Smith, John-Paul Anders, Richard Schmidt, and Glen Johnson, Department of Nutrition and Health Sciences, University of Nebraska Lincoln.

- 9:40 9. GENE EXPRESSION, BIOMARKER, AND FUNCTIONAL ANALYSIS OF SPACE-FLOWN MICE MUSCLE GROUPS REVEALS ANTIOXIDATIVE ENRICHMENT. Kaitlin Goettsch*, Sean West, and Dhundy (Kiran) Bastola, School of Interdisciplinary Informatics, University of Nebraska at Omaha.
- 9:50 10. DIRECTING CELLULAR RADIATION RESPONSE VIA FERROPTOSIS MANIPULATION. Joseph Carmicheal*, Alexandra Seas, Nolan File, Chi Lin, Sicong Li, Sukhwinder Kaur, and Surinder K. Batra, Department of Biochemistry and Molecular Biology, University of Nebraska Medical Center, Omaha.
- 10:00 11. CORTICAL OSCILLATIONS THAT UNDERLIE VISUAL SELECTIVE ATTENTION. Rashelle M. Hoffman*, Christine M. Embury, Brandon J. Lew, Elizabeth Heinrichs-Graham, Tony W. Wilson, and Max J. Kurz, Department of Physical Therapy, Munroe-Meyer Institute, University of Nebraska Medical Center, Omaha.
- 10:10 12. THE DEVELOPMENT OF A FLUID SHEAR STRESS STREAMER FOR LIVE CELL VIDEO MICROSCOPY. Travis McCumber*, Edson deOliveira, and Dane Wilson, Department of Genetics, Cell Biology and Anatomy, University of Nebraska Medical Center, Omaha.
- 10:20 13. VISUAL PERTURBATION IMPACTS MUSCLE CO-CONTRACTION WHILE WALKING ON FLAT AND INCLINED TREADMILL. Jie Hao*, Weihua Li, Yuhang Zhang, and Ka-Chun Siu, Department of Physical Therapy Education, University of Nebraska Medical Center, Omaha.
- 10:30 BREAK/POSTER PRESENTATIONS – Acklie 109 & 111
- 10:50 14. STRUCTURAL INVESTIGATIONS INTO THE CATALYTIC MECHANISM OF HUMAN MANGANESE SUPEROXIDE DISMUTASE USING NEUTRON AND X-RAY CRYSTALLOGRAPHY. Jahaun Azadmanesh*, William E. Lutz, Kevin L. Weiss, Leighton Coates, and Gloria E. O. Borgstahl, Department of Biochemistry and Molecular Biology, University of Nebraska Medical Center, Omaha.
- 11:00 15. TESTING QUASAR ACCRETION DISK WIND MODELS USING THE SDSS SPECTRAL DATABASE. Mason Rhodes* and Jack Gabel, Department of Physics, Creighton University, Omaha.
- 11:10 16. EXPERIMENTAL EVOLUTIONARY INVESTIGATION OF PROTEIN-PROTEIN INTERACTIONS IN LARGE PROTEIN COMPLEXES. Richard Cassidy*, Zoe Alam, Gabby Beeler, and Ann Cavanaugh, Department of Biology, Creighton University, Omaha.
- 11:20 17. EMISSION SIGNATURE OF BINARY SELF-LENSING SUPERMASSIVE BLACK HOLES. John O. Dancewicz Helmers* and Jack Gabel, Physics Department, Creighton University, Omaha.
- 11:30 18. SOL-GEL PREPARATION OF NOVEL GEO₂ AND GEO₂-SIO₂ NANOPARTICLES FOR USE IN 3D PRINTED OPTICS. Alexandra Vahle*, Cameron Jayson, and Joel Destino, Department of Chemistry, Creighton University, Omaha.
- 11:40 19. OPTIMIZED SOL-GEL DERIVED SI-BASED NANOPARTICLES FOR USE IN LUMINESCENCE-BASED CHEMICAL SENSING. Emilia M. Berni*, Peter S. Palencia, and Joel F. Destino, Department of Chemistry, Creighton University, Omaha.

- 11:50 20. PIPELINE INTO THEORETICAL MATHEMATICS. Griff Elder*, Jacob Cleveland, Xzavier Herbert, Gage Hoefer, Hudson Hooper, Brad Horner, Ethen Kuether, Andrew Li, Sarah McCarty, and Grant Moles, Department of Mathematics, University of Nebraska at Omaha.

AERONAUTICS AND SPACE SCIENCE

Chairperson: Michaela F. Lucas

NASA Nebraska Space Grant & EPSCoR, University of Nebraska at Omaha

SESSION B

Acklie Hall Room 111

- 8:00 1. COMPUTATIONAL FLUID DYNAMICS ON TRANSITION TO TURBULENCE. Elizabeth Spaulding* and Jae Sung Park, Department of Mechanical and Materials Engineering, Adam Larios, Department of Mathematics, University of Nebraska - Lincoln.
- 8:10 2. PROTOTYPING AND VALIDATION OF A MODULAR 6-DOF 3-LEG PARALLEL ROBOT ADAPTABLE FROM AN RRRS TO AN RRPS CONFIGURATION. Nathan Jensen* and Carl Nelson, Department of Mechanical and Materials Engineering, University of Nebraska – Lincoln.
- 8:20 3. DATA ANALYSIS OF TEST ROTORS IN MARTIAN ATMOSPHERIC CONDITIONS. Nathan Jensen, Department of Mechanical and Materials Engineering, University of Nebraska – Lincoln.
- 8:30 4. EFFICIENT SUPERSONIC ROCKET UTILIZING STUDENT MANUFACTURED CARBON FIBER TUBES. Dillon Margritz*, Quinn Brandt, Bricen Margritz, and Joseph Broadway, Department of Mechanical and Materials Engineering, University of Nebraska-Lincoln.
- 8:40 5. COMPUTER SCIENCE TRAINING IN HIGHER EDUCATION USING ROBOTICS. William A Loring and Bill Spurgeon*, Information Technology Program, Western Nebraska Community College at Scottsbluff.
- 8:50 6. NODE BASED PATHFINDING AND SATELLITE AUTONOMOUS NAVIGATION USING THE GO PI GO RASPBERRY PI ROBOT. Daniel Smith* and William Loring, Computer Science, Western Nebraska Community College, Scottsbluff.
- 9:00 7. ENHANCING INTRODUCTORY CLASSES WITH HANDS ON PROJECTS. Hunter Nelson*, William Spurgeon, and Scott Schaub, Mathematics and Science, Western Nebraska Community College, Scottsbluff.
- 9:10 BREAK/POSTER PRESENTATIONS – Acklie 109 & 111
- 9:30 8. COLLEGE OF SAINT MARY SCIENCE ENRICHMENT WORKSHOP SERIES: A FOCUS ON ELEMENTARY SCIENCE EDUCATORS. Amanda Roe*, Department of Biology, Ganesh Naik, Department of Chemistry, Kelly Murphy and Mark Sand, Department of Mathematics 4Math Program, College of Saint Mary, Nancy Thornblad and Dayna Derichs, Omaha Public Schools, Omaha.

- 9:40 9. IN-VITRO ANTICANCER EFFECT OF CURCUMIN, QUERCETIN AND THEIR COMBINATION ON MELANOMA CELL LINES. Farrah Soll* and Dr. Dunesh Kumari, Department of Chemistry, College of Saint Mary, Tyler Moore, Department of Biology, Bellevue University, Bellevue.
- 9:50 10. WOMEN IN AVIATION: WHERE ARE THEY? Rebecca Lutte, Aviation Institute, University of Nebraska at Omaha.
- 10:00 11. HEAVY METAL AND NITRATE CONCENTRATIONS IN GROUND AND SURFACE WATER NEAR CRAWFORD NEBRASKA. Isaac Langan*, Mike Leite, and Jennifer Balmat, Department of Physical Science, Chadron State College, Dr. Dana Richter-Egger, Department of Chemistry, University of Nebraska at Omaha.
- 10:10 12. IDENTIFYING EARTH ANALOGUE SITES TO TEST AND ASSESS THE MARS HELICOPTER'S ABILITY TO CAPTURE IMAGES OF ASTROBIOLOGICAL TARGETS DURING THE MARS 2020 MISSION. Jessica Rowshandel, Physical and Life Sciences Department, Chadron State College, Chadron.
- 10:20 13. COMPARISON OF PLANT GROWTH IN THREE MARTIAN SOIL SIMULANTS. Marc Albrecht* and Jackson Barnes, Department of Biology, University of Nebraska at Kearney.
- 10:30 BREAK/POSTER PRESENTATIONS – Acklie 109 & 111
- 10:50 14. CORTICAL PROCESSING OF SOMATOSENSORY INFORMATION IS REDUCED WHILE PERFORMING A MOTOR TASK. Michael P. Trevarrow*, James E. Gehringer, Tony W. Wilson, and Max J. Kurz, Department of Physical Therapy and Center for Magnetoencephalography, University of Nebraska at Omaha.
- 11:00 15. PERCEPTION IN SPACE. Kyle Brozek*, Steven Belcher, Prithviraj Dasgupta, Mukul Mukherjee, Department of Biomechanics, Computer Science Department, University of Nebraska at Omaha.
- 11:10 16. SUPERVISED AND UNSUPERVISED MACHINE LEARNING TECHNIQUES FOR PREDICTING MOBILITY-RELATED PERCEPTION ERRORS IN ASTRONAUTS. Steven Belcher* and Prithviraj Dasgupta, Computer Science Department, Kyle Brozek and Mukul Mukherjee, Department of Biomechanics, University of Nebraska at Omaha.
- 11:20 17. BIMANUAL COORDINATION ASSESSMENT USING PROSTHETIC SIMULATORS. Christopher Copeland*, James Pierce, Keaton Young, and Jorge Zuniga, Department of Biomechanics, University of Nebraska at Omaha.
- 11:30 18. APPLICATIONS OF ANTIMICROBIAL 3D PRINTING MATERIALS IN SPACE. Michael Thompson* and Jorge Zuniga, Department of Biomechanics, University of Nebraska at Omaha.
- 11:40 19. 3D PROSTHETICS EFFECTS ON STANDING POSTURE IN UNILATERAL UPPER LIMB DEFICIENT CHILDREN. Keaton Young, Department of Biomechanics, University of Nebraska at Omaha, NE 68182.
- 11:50 20. DEVELOPMENT OF LOW-COST 3D PRINTED ANATOMICAL MODELS FOR PRE-SURGICAL PLANNING AND EDUCATION. David Salazar*, Justin Cramer, Nicholas Markin, Gabe Linke, and Jorge Zuniga, Department of Biomechanics, University of Nebraska Omaha, Omaha.

AERONAUTICS AND SPACE SCIENCE

Chairperson: Scott E. Tarry
NASA Nebraska Space Grant & EPSCoR, University of Nebraska at Omaha

POSTER SESSION

9:10 – 9:30 a.m. & 10:30 – 10:50 a.m.

Acklie 109 & 111

THE VIRULENCE OF PYTHIUM IRREGULARE AND PYTHIUM ULTIMUM AT VARYING DEGREES OF TEMPERATURE. Alyssa Anderson* and Phyllis Higley, College of Saint Mary, Omaha.

COLLEGE OF SAINT MARY ELEMENTARY OUTREACH PROGRAM 2018-2019. Elisabeth White, Chloe Jensen, and Jennifer Grove*, Department of Biology, College of Saint Mary, Omaha.

EFFECTS OF TEMPERATURE AND PLANT HOST ON THE VIRULENCE OF ISOLATES OF PYTHIUM IRREGULAR AND PYTHIUM ULTIMUM. Emma Turner* and Phyllis Higley, Department of Biology, College of Saint Mary, Omaha.

AMORPHOUS FORMULATION OF POORLY SOLUBLE CURCUMIN AND PIPERINE: CHARACTERIZATION AND IN VITRO STUDIES. Anne Wilson* and Dunesh Kumari, Department of Chemistry, College of Saint Mary, Deepal Vora, School of Pharmacy, Creighton University, Omaha.

DEVELOPMENT OF CHEMICALLY MODIFIED LUMINESCENT SILICON NANOSTRUCTURES WITH POTENTIAL USE IN THE DETECTION OF ABIOGENIC COMPOUNDS. Peter S. Palencia, Emilia M. Berni, and Joel F. Destino*, Department of Chemistry, Creighton University, Omaha.

USING DRONE IMAGERY TO EVALUATE LANDSCAPE-BASED VARIATION IN VEGETATION OF THE NEBRASKA SANDHILLS. Alexander Larsen and Mary Ann Vinton*, Environmental Science Program and Department of Biology, Creighton University, Omaha.

ENVIRONMENTAL MONITORING THROUGH NATIVE PRAIRIE RESTORATION. Anthony Warrior*, Lorraine Smith*, Alexander White, Gabriela Medina, Inessa Lyons, Susan Morris, Clorice Denny, Marcus Redwing, and Hank Miller, Department of Natural Resources, Nebraska Indian Community College, Niobrara.

DEVELOPMENT OF A DEPLOYABLE AND RETRACTABLE BOOM FOR SPACE PLATFORMS. Renick Wilson*, Ryan Green, Tom Faulconer, and Zoe Marzouk, College of Engineering, Mechanical and Materials Engineering, University of Nebraska-Lincoln.

ASSESSMENT OF 3D PRINTED FINGER PROSTHESES: A COMPARATIVE CASE STUDY. Claudia Cortes Reyes*, Roberto Saavedra, Keaton Young & Jorge Zuniga, Department of Biomechanics, University of Nebraska at Omaha.

EFFICACY OF ASSISTIVE DEVICES PRODUCED WITH ADDITIVE MANUFACTURING. James Pierce*, Christopher Copeland, and Jorge Zuniga, Department of Biomechanics, Will Picken, Department of Electrical Engineering, University of Nebraska at Omaha, Omaha NE 68182, Jean Peck, CHI Health, Omaha.

IMPLEMENTATION OF A 3D SCANNER ARM. Walker Arce*, James Pierce III, and Jorge Zuniga, Department of Biomechanics, University of Nebraska at Omaha.

WALKING ON INCLINED SURFACE ENHANCES OBSTACLE NEGOTIATION CAPABILITY FOR ASTRONAUTS. Devan Sedlacek, Weihua Li*, Jiani Lu, and Jung Hung Chien, Department of Physical Therapy Education, University of Nebraska Medical Center, Omaha.

IMPACT OF GENDER CHARACTERISTICS, EMPATHY, AND STRESS ON TASK PERFORMANCE RELEVANT TO NASA MISSIONS. Abi M Heller* & Janelle N Beadle, Department of Gerontology, University of Nebraska Omaha.

HD-TDCS DIFFERENTIATES FRONTO-VISUAL THETA LATERALIZATION DURING VISUAL SELECTIVE ATTENTION. Rachel K. Spooner*, Michael Rezich, and Tony W. Wilson, Department of Neurological Sciences, Center for Magnetoencephalography, University of Nebraska Medical Center, Omaha.

ANTHROPOLOGY

Co-chairs: Wayne Babchuk and Emily Jensen
Department of Anthropology, University of Nebraska–Lincoln
Acklie Hall Room 109

- 12:50 WELCOME AND INTRODUCTION. Emily Jensen and Wayne Babchuk, Co-Chairs, Anthropology Section, Nebraska Academy of Sciences.
- 1:00 1. VERBAL AND NONVERBAL CHANNELS OF COMMUNICATION AFTER COMPLETING TASKS VARYING ON TASK DIFFICULTY. Philip Lai*, Rachel Southard, Breana Johnson, and Elaina Eddy, University of Nebraska-Kearney
- 1:10 2. USING VIRTUAL REALITY AND DIGITAL ARTIFACTS TO ENHANCE DATABASE STRUCTURES AND FACILITATE DATA REUSE. Cole Juckette, Department of Anthropology, University of Nebraska-Lincoln
- 1:30 3. SYNCRETIC ARTWORK OF THE CHILAM BALAM. Amy Sue Peterson, Department of Anthropology, University of Nebraska-Lincoln
- 1:50 4. LOW-POWER USE-WEAR ANALYSIS OF OBSIDIAN ARTIFACTS FROM THE EL INGA/SAN JOSE SITES, ECUADOR. Paige Herrera, Department of Anthropology, University of Nebraska-Lincoln
- 2:10 5. CERAMIC AND OSL ANALYSIS AT 25HO21. Ryan Mathison, Department of Anthropology, University of Nebraska-Lincoln.
- 2:30 6. COMPARING PRIMATE DENTAL DEVELOPMENT AMONG *GORILLA GORILLA* AND *GORILLA BERINGEI* SPECIES. Rachel Dickerson and Emily Hammerl, Department of Anthropology, University of Nebraska-Lincoln
- 2:50 BREAK
- 3:00 7. OSTEOLOGICAL PATHOLOGY IN HUNTER-GATHERER POPULATIONS. Bailey Ottel, Department of Anthropology, University of Nebraska-Lincoln
- 3:20 8. “VISCERAL CARTOGRAPHIES” OF AZERBAIJAN AS STANDARD STORIES OF VICTIMHOOD: USING SITUATIONAL ANALYSIS IN GEOPOLITICAL RESEARCH. James Baker, Department of Geography, University of Nebraska-Lincoln

- 3:40 9. THE ARABIAN BEDOUIN: AN IMPOVERISHED NOBILITY. Sarah Ghannam
Department of Anthropology, University of Nebraska-Lincoln
- 4:00 10. EXPLORING ETHNOGRAPHIC METHODS IN NONTRADITIONAL CONTEXTS:
A STUDY OF PUBLIC LIBRARIES AND LITERACY ACHIEVEMENT. Tiffany Young,
Department of Teaching, Learning, and Teacher Education, University of Nebraska-Lincoln
- 4:20 11. THEY WALKED WITH THE BUFFALO: A RESPONSE TO ANGLO-AMERICAN
PERCEPTIONS OF MANDAN WOMEN. Jayne Kinney, Department of History, University of
Nebraska-Lincoln
- 4:40 12. DEVELOPING AN AUGMENTED REALITY TOUR OF CAMPUS HISTORY USING
GEOGRAPHIC INFORMATION SYSTEMS AND 3D MODELING. Jancy Nielson, Heather
Richards-Rissetto, and Effie Athanassopoulos, Departments of Anthropology and Classics,
University of Nebraska-Lincoln
- 5:00 ADJOURN

APPLIED SCIENCE AND TECHNOLOGY

Chairperson: Mary Ettel
Wayne State College, Wayne
Olin Hall Room 111

- 1:00 Opening Remarks
- 1:05 1. DETECTION OF CANNABINOIDS FROM MARIJUANA FLOWER, CONCENTRATE AND
TOPICAL USING COLORIMETRIC SENSOR ARRAYS. Andres V. Mora*, Michael Kangas
and Andrea E. Holmes, Department of Chemistry, Doane University, Crete, NE; and Amanda
DeBono, AgriScience Labs, Denver, CO
- 1:20 2. IMPROVING ASSESSMENT METHODS OF TARTARIC ACID IN WINE. Jasmine
DeMonte* and Darius Agoumba, Department of Physical Sciences and Mathematics, Wayne
State College, Wayne, NE
- 1:40 3. DEVELOPMENT OF A MANUFACTURING METHOD FOR SUPER COILED POLYMER
ACTUATORS. Caleb Gilmore*, Renick Wilson, Brandon Warren, Kevin Dejonge, Lindsay
Barnum and Han Jiang, Department of Mechanical Engineering, University of Nebraska-
Lincoln, Lincoln, NE
- 1:55 4. MARS 2020 HELICOPTER: ENHANCING MISSION AND TECHNOLOGY OBJECTIVES
THROUGH SIMULATION. Chance Adolf, Department of Physical and Life Sciences, Chadron
State University, Chadron, NE
- 2:15 BREAK

- 2:20 5. “SMART” NEST BOX TECHNOLOGY: UTILIZING UNIQUE ADVANTAGES WITHIN COMMUNITY COLLEGES TO EXPEDIENTLY AND REMOTELY COLLECT AVIAN DATA. Dylan Smith*, Michael Bates, Landon Sokol, Tychique Kutalu, Elizabeth Ewing, Janessa Grooms, Andres Espino, Alejandro Espino, Alex Koch, Kayla Kreizel, Steven Heinisch and Lauren Gillespie*, Department of Academic Education, Central Community College, Columbus, NE; and Neil Grandgenett, Department of STEM Education, University of Nebraska-Omaha, Omaha, NE
- 2:40 6. A FORMAL APPROACH TO CIRCLE FORMATION IN MULTI-AGENT SYSTEMS. Rui Yang*, Azad Azadmanesh and Hassan Farhat, Department of Computer Science, University of Nebraska-Omaha, Omaha, NE
- 2:55 7. PERFORMANCE COMPARISON OF SDN CONTROLLERS USING DIFFERENT NETWORK ENVIRONMENTS. Shideh Yavary Mehr* and Byrav Ramurthy, Department of Computer Science and Engineering, University of Nebraska-Lincoln, Lincoln, NE

BIOLOGICAL AND MEDICAL SCIENCES

Chairperson: Annemarie Shibata
Department of Biology, Creighton University

SESSION A

Session Chairperson: Annemarie Shibata, Creighton University
Olin Hall Room 112

- 8:00 1. USING WEARABLE ROBOTICS TO REVEAL THE TIME PROFILE OF METABOLIC COST. Philippe Malcolm*, Prokopios Antonellis, Arash M. Gonabadi, University of Nebraska Omaha, Omaha, NE 68182
- 8:10 2. ANTIMICROBIAL PROPERTIES OF ETHER-CONTAINING 1,3,4-TRISUBSTITUTED-1,2,3-TRIAZOLIUM SALTS. Eilidh I Chowanec* and James T Fletcher, Department of Chemistry, Creighton University, Omaha, NE 68178
- 8:20 3. FLEXIBLY SWITCHING POSTURAL RESPONSES BETWEEN STRUCTURED VISUAL STIMULI DEPENDS ON THE TEMPORAL DETERMINISM OF THE STIMULI. Zachary Motz*, Takashi Sado, William Denton, Mukul Mukherjee, Department of Biomechanics, University of Nebraska at Omaha, NE 68182
- 8:30 4. INSECT VISITORS TO PRAIRIE FLOWERS: PROPORTIONS OF DIFFERENT GROUPS. Sydney E. Westphal* and Theodore Burk, Central High School, Omaha, NE, 68102, and Biology Department, Creighton University, Omaha, NE 68178
- 8:40 5. BIODIVERSITY OF VECTOR MOSQUITOES AT THE US MEAT ANIMAL RESEARCH CENTER. Justine Amalia LaViolette*, Troy Anderson, Bellevue University, Bellevue, NE 68005
- 8:50 6. CONSISTENT SIMILARITY IN NEST DEFENSE BEHAVIOR BETWEEN EASTERN BLUEBIRD MATED PAIRS WITH BOTH UV AND MELANIN ORNAMENTS SIGNALING BEHAVIOR. Elizabeth Ewing, Kayla Kreizel, Andres Espino, Jenessa Grooms, Alex Koch, Steve Heinisch, Lauren Gillespie*, Department of Academic Education, Central Community College, Columbus, NE, 68601

- 9:00 7. THE USE OF BACTERIOPHAGE COCKTAILS TO DECONTAMINATE POLLUTED WATER, SURFACES, AND FOODSTUFFS. Natalie Kuhn* and Michael Olive, Department of Biology, Nebraska Wesleyan University, Lincoln, NE 68504
- 9:10 8. THE EFFECT OF NORA VIRUS INFECTION ON NATIVE GUT BACTERIAL COMMUNITIES AND LIFESPAN OF *DROSOPHILA MELANOGASTER*. Makayla Nemecek*, Rebecca Best, Shelby Liesemeyer, Darby J Carlson, Julie J Shaffer, and Kimberly A Carlson, Department of Biology, University of Nebraska at Kearney, Kearney, NE 68849
- 9:20 BREAK
- 9:30 9. ASSESSING THE EFFECTIVENESS OF A NOVEL DNA VACCINE AGAINST *TOXOPLASMA GONDII*. Rosalie Warner, University of Nebraska-Omaha, Omaha, NE 68182
- 9:40 10. CHARACTERIZATION OF *STAPHYLOCOCCUS LUGDUNENSIS* BIOFILMS. Justine M. Pitzer* and Austin S. Nuxoll, Department of Biology, University of Nebraska at Kearney, Kearney, NE 68849
- 9:50 11. PHOSPHINATE-CONTAINING FLUOROPHORES AS GATED SMALL MOLECULE DELIVERY PLATFORMS. Lauren Lesiak*, Yuan Fang, Mehrdad Shadmehr, Xinqi Zhou, Cliff Stains, University of Nebraska-Lincoln, Lincoln, NE 68588
- 10:00 12. PEPPERMINT ESSENTIAL OIL (*MENTHA PIPERITA*) AS A NATURAL REPELLENT AGAINST AMERICAN COCKROACHES (*PERIPLANETA AMERICANA*). Breana Dobesh* and Marc Albrecht, Department of Biology, University of Nebraska at Kearney, Kearney, NE 68849
- 10:10 13. CHARACTERIZATION OF THE INTERACTION BETWEEN CAF-1 AND PCNA. Jacquelyn Wright, Department of Chemistry, Creighton University, Omaha, NE 68178
- 10:20 14. ACQUISITION RATE OF THE GUT MICROBIOTA IN *DAPHNIA MAGNA*. Jessica Hotovy*, Sarah Tjards, Reilly Cooper, Dr. Clayton Cressler, Department of Biological Sciences, University of Nebraska Lincoln, NE 68508
- 10:30 15. CHARACTERIZATION OF TARDIGRADE MICROBIOME. Mary Morris* and Jenifer Grove, Department of Biology, College of Saint Mary, NE 68106
- 10:40 16. EXAMINATION OF DRONE (UAS) USE FOR SPOTTING CANADA GEESE ON A CENTRAL NEBRASKA LAKE. Riley Pulver* and Marc Albrecht, Department of Biology, University of Nebraska-Kearney, Kearney, NE 68849
- 11:00 MAIBEN MEMORIAL LECTURE - OLIN HALL B

SESSION B

Session Chairperson: Marsha Pierce, Creighton University
Smith Callen Conference Center

- 8:00 1. GROWTH KINETICS OF A SUSPENDED CELL ARTHROBACTER
AURESCENS TC1 SYSTEM GROWN IN GLUCOSE + ATRAZINE MINIMAL MEDIA.
Teryn Koch^{1*}, James Reddick¹, and Christopher D. Wentworth², Doane University, Crete, NE
68333, ¹ Department of Biology, ² Department of Physics & Engineering, Doane University,
Crete, NE 68333
- 8:10 2. DECREASED TRICARBOXYLIC ACID (TCA) CYCLE ACTIVITY IN
STAPHYLOCOCCUS AUREUS INCREASES SURVIVAL TO INNATE IMMUNITY. Trevor
Daubert*, Kennedy Kluthe*, Alexis Page, Daniel Nabb, and Austin Nuxoll. Department of
Biology, University of Nebraska at Kearney, NE 68849
- 8:20 3. IDENTIFICATION AND VALIDATION OF FBXO9 INTERACTING PROTEINS IN ACUTE
MYELOID LEUKEMIA. Mika Caplan*, R. Willow Hynes-Smith, Samantha Swenson, Karli
Wittorf, Heather Vahle, Tyler Gilbreath, and Shannon Buckley. Dept. of Genetics, Cell Biology,
and Anatomy, University of Nebraska Medical Center, Omaha, NE 68198
- 8:30 4. PROBING ASTROCYTE FUNCTION IN FRAGILE X SYNDROME USING HUMAN
PLURIPOTENET STEM CELL-DERIVED ASTROCYTES. B. Ren, P. Ragunathan, Y. Jung,
V. Sani, B. Oldham*, A. Armstrong, N. Raj, G. Bassell, A. Dunaevsky, Developmental
Neurosci., Univ. of Nebraska Med. Ctr., Omaha, NE, Dept. of Cell Biol., Emory Univ. Sch. of
Med., Atlanta, GA
- 8:40 5. PERSISTENT FORMATION IN *STAPHYLOCOCCUS EPIDERMIDIS* CLINICAL ISOLATES.
Seth Ostdiek*, Amber Menard, Kaitlyn Pineda, and Austin Nuxoll. Department of Biology,
University of Nebraska at Kearney, Kearney, NE 68849
- 8:50 6. FDA-APPROVED DRUGS ADMINISTERED IN COMBINATION AS
TREATMENT AGAINST CHRONIC *TOXOPLASMA GONDII* INFECTION. Maxwell Virus,
University of Nebraska-Omaha, Omaha, NE 68182
- 9:00 7. ELUCIDATION OF THE NOVEL ANTIPARASITIC TARGET ROP1 FROM
AN INTEGRATED FORWARD GENETIC SCREEN IN *TOXOPLASMA GONDII*. Matthew C.
Martens*, Madalyn M. McFarland, Abigail K. Judge, Thomas T. Schulze, Harim I. Won, Paul H.
Davis, Department of Pathology and Microbiology, University of Nebraska Medical Center,
Omaha, NE 68198
- 9:10 8. ANTIBACTERIAL EFFECTS OF ESSENTIAL OILS ON A BACTERIAL
STRAIN ISOLATED FROM A PATIENT WITH STASIS DERMATITIS. Jamie Stewart,
Bryan College of Health Sciences, Lincoln, NE 68506
- 9:20 BREAK
- 9:30 9. EXPRESSION OF VIR-1 AND VAGO IN NORA VIRUS *INFECTED DROSOPHILA*
MELANOGASTER HEMOLYMPH. Amanda Macke*, Darby J Carlson, and Kimberly A. Carlson,
Department of Biology, University of Nebraska at Kearney, Kearney, NE 68849

- 9:40 10. THE ROLE OF THE OAZ1 RNA IN CONTROLLING GENE EXPRESSION. Logan P. Baumberger*, Taylor L. Burke, Garrett A. Soukup, and Juliane K. Soukup, Department of Chemistry, Creighton University, 2500 California Plaza, Omaha, NE 68178, & Creighton University School of Medicine, 2500 California Plaza, Omaha, NE 68178.
- 9:50 11. STRUCTURAL ANALYSIS OF OAZ1 RNA IN CRASSOSTREA GIGAS. Spencer Thompson*, Siddharth Venkatraman, Juliane Soukup Department of Chemistry, Creighton University, 2500 California Plaza, Omaha, NE 68178
- 10:00 12. A SCREEN OF CHROMATIN ARCHITECTURAL PROTEINS WITH HISTONE MODIFICATION PARTNERS FOR INSULATOR ACTIVITY IN *SACCHAROMYCES CEREVISIAE*. Nicholas Scalora*, Joe Larkin*, Keegan Whisler*, Aubrey Schatz, and Brett J. Schofield, Department of Biology, Doane University, Crete, NE 68333
- 10:10 13. ACTIVATION OF IMMUNE CELLS AS THE MECHANISM OF ACTION OF ANTISCHISTOSOMAL COMPOUND SAS1. Samantha Sack*, Caelyn Armshaw, and Paul Davis, Department of Biology, University of Nebraska at Omaha, NE 68182
- 10:20 14. DETERMINATION FOR ENHANCED YIELDS OF *PSEUDOMONAS AERUGINOSA* PERSISTENT CELL POPULATION AFTER THE TREATMENT OF VARYING ANTIBIOTICS. Courtney Marcelino*, Dr. Arin Sutlief, and Marco Perez, Doane University, Crete, NE 68333
- 10:30 15. CLONING, EXPRESSION, AND CHARACTERIZATION OF 5-AMINOLEVULINIC ACID DEHYDRATASE FROM *ESCHERICHIA COLI*. Frank A. Kovacs*, Michael A. Moxley, and Samuel Novicki, Department of Chemistry, University of Nebraska at Kearney, NE 68849
- 10:40 16. CHANGING ANKLE STIFFNESS TO ADAPT TO DIFFERENT MECHANICAL DEMANDS. Erica A. Hedrick¹*, Philippe Malcolm¹, Jason M. Wilken², Kota Z. Takahashi¹, ¹Department of Biomechanics, University of Nebraska at Omaha, Omaha, NE 68182, ²Department of Physical Therapy & Rehabilitation Science, University of Iowa, Iowa City, Iowa 52242
- 11:00 MAIBEN MEMORIAL LECTURE - OLIN HALL B

SESSION C

Session Chairperson: Patricia Soto, Creighton University
Olin Hall Room 112

- 1:00 1. DRIVING FORCES STABILIZING CELLULAR PRION PROTEIN (PRPC) MONOMERS AND DIMERS ON THE CELL SURFACE. Frances Morden*, Patricia Soto, Creighton Univ, Omaha, NE 68178
- 1:10 2. POLYMORPHISMS MODULATE SHEEP PRION PROTEIN SUSCEPTIBILITY TO MISFOLDING BY ALTERING THE LOCAL RESIDUE NETWORK OF INTERACTIONS. India Claflin*, Alyssa Bursott, Noah Yoshida, Patricia Soto. Creighton Univ, Omaha, NE 68178

- 1:20 3. INVESTIGATING THE STRUCTURAL EFFECTS OF POINT MUTATIONS ON ACETYLTRANSFERASES BY COMPUTATIONAL METHODS. Kole J. Runyan^{1*}, Sara Lowe², Logan Kaler², Patricia Soto³, Yadilette Rivera-Colón², ¹Department of Chemistry, Creighton University, ² Bay Path University, ³ Department of Physics, Creighton University, Omaha, NE 68178
- 1:30 4. OPTIMIZATION: UTILIZING SIRNAS TO KNOCKDOWN ARGONAUTE GENE FAMILY AND DETECTION OF BOVINE MIRNAS. Daniel Gutzmann*, Douglas Christensen, Shawn Percy, Department of Biology, Wayne State College, NE 68787; and Audrey Atkin, Department of Biological Sciences, University of Nebraska-Lincoln, NE 68588
- 1:40 5. ADIPOSE TISSUE RENIN-ANGIOTENSIN SYSTEM AND SYSTEMIC HYPERTENSION. Steven D. Scott*, Elizabeth J. Pekas, Ronald J. Headid III, Michael D. Shukis, and Song-Young Park, School of Health and Kinesiology, University of Nebraska at Omaha, Omaha, NE 68182
- 1:50 6. EFFICACY OF PAN-PARASITIC EXPERIMENTAL COMPOUNDS AGAINST *TOXOPLASMA GONDII* IN BOTH *IN VITRO* AND *IN VIVO* MODELS. Austin Sanford*, Ryan Grove, Alexander Wallick, Rosalie Warner, Gabrielle Watson, Xiaofang Wang, Jonathan L. Vennerstrom, and Paul H. Davis, University of Nebraska Medical Center, Omaha, NE 68198
- 2:00 7. CHARACTERIZATION OF SHEEP IFITM3 AS A RESTRICTION FACTOR OF SMALL RUMINANT LENTIVIRUS. Marisa Foster*, Jason Iltz, Dane Bowder, Department of Biology, Doane University, Crete, NE 68333
- 2:10 8. POSSIBLE PATHOGENIC EFFECT CAUSED BY NORA VIRUS INFECTION IN *DROSOPHILA MELANOGASTER*. Lesley Towery*, Amanda McCown, Abigail Benz, Devyn Crisman, and Kimberly A. Carlson, Department of Biology, University of Nebraska at Kearney, Kearney, NE 68849
- 2:20 9. EFFECTS OF CURCUMIN ON THE NF- κ B PATHWAY IN TRIPLE NEGATIVE BREAST CANCER. Gabrielle Brumfield*, Shoichi Arai, and Ann Buchmann, Department of Mathematical and Natural Sciences, Chadron State College, Chadron NE 69337
- 2:30 10. HIGH GLUCOSE CONDITIONS AFFECT PHYSICAL CHARACTERISTICS OF BREAST CANCER CELLS AND INCREASES PROLIFERATION THROUGH POLYAMINE PATHWAY. Jose Ortega, Caleb Capellen, Roman W Schmidt, Diganta Dutta, and Surabhi Chandra, University of Nebraska-Kearney, Kearney, NE 68849
- 2:40 BREAK
- 2:50 11. PLATELET MEDIATED RESCUE OF PANCREATIC CANCER CELLS IN ANCHORAGE- INDEPENDENT CONDITIONS. Gabrielle Brumfield^{1*}, Andrew Cannon², Sushil Kumar², and Surinder K. Batra^{2,3}, ¹Department of Mathematical and Natural Sciences, Chadron State College, Chadron, NE, ²Department of Biochemistry and Molecular Biology, ³Fred and Pamela Buffet Center, University of Nebraska Medical Center, Omaha, NE 68198
- 3:00 12. IDENTIFYING THE MOLECULAR TARGET OF ANTITOXOPLASMA COMPOUND SW33. Sean Watson*, Andrew Pham, Austin Sanford, and Paul Davis, University of Nebraska at Omaha, Omaha, NE 68182

- 3:10 13. DYSBINDIN AND AMYLOID PRECURSOR PROTEIN INVOLVEMENT IN NEURAL DEVELOPMENT AND BEHAVIOR IN *DROSOPHILA MELANOGASTER*. Wacey Gallegos* & Ann Buchmann, Department of Mathematics and Natural Sciences, Chadron State College, Chadron, NE 69337
- 3:20 14. EXAMINATION OF ORNITHINE DECARBOXYLASE ANTIZYME RNA STRUCTURE AND FUNCTION FOR THE DEVELOPMENT OF ANTIBIOLOGICAL AGENTS. Zach Frevert*, Korey Krutsinger, and Julie Soukup, Department of Chemistry, Creighton University, Omaha, NE 68178
- 3:30 15. DEFINING THE BIOLOGICAL ROLE OF THE CONNEXIN43 CARBOXYL TERMINAL ALPHA HELICAL DOMAINS. Andrew Pham*, Gaelle Spagnol, Andrew Trease, Li Zheng, and Paul Sorgen, Department of Biochemistry and Molecular Biology, University of Nebraska Medical Center, NE 68198
- 3:40 16. CHICKEN HATCHLINGS AS AN ALTERNATIVE HOST FOR BUGGY CREEK VIRUS. Alison Guyer*, Tyler Rollman, and Carol Fassbinder-Orth, Department of Biology, Creighton University, NE 68178
- 3:50 17. SECONDARY STRUCTURE ANALYSIS WITH SHAPE-MAP OF HUMAN HERPESVIRUS 8 POLYADENYLATED RNA. Tim Reznicek, University of Nebraska- Omaha, Omaha, NE 68182
- 4:00 18. A SEMI-AUTOMATED SYSTEM FOR QUANTIFYING FOOT TEMPERATURE CHANGES FOLLOWING LOCOMOTION. Andrew M. Kern*¹, Gregory J. Faber¹, Jacob Bloomberg² and Kota Z. Takahashi¹, ¹Department of Biomechanics, University of Nebraska at Omaha, NE 68122, ²Neuroscience Laboratories, NASA-Johnson Space Center, TX 77058
- 4:10 19. THE ORAL MICROBIOME IN FELINE STOMATITIS. Sarah Schiefelbein, Bellevue University, Omaha, NE 68005
- 4:20 20. MAPPING THE BINDING SITES FOR CAF-1 ON PCNA. Robyn Scott* and Dr. Lynne Dieckman, Chemistry Department, Creighton University, Omaha, NE 68178
- 4:30 21. DEVELOPMENT AND CHARACTERIZATION OF A POLYMERASE CHAIN REACTION ASSAY FOR THE 16S RIBOSOMAL GENE OF *BORRELIA BURGDORFERI*. Morgan Shipley*, Emmalynn Walvoord, Bailey Hallgren Meehan, and D. Michael Olive Nebraska Wesleyan University, Lincoln, NE 68504
- 4:40 22. THE EFFECT OF COMMERCIAL FEED VS CUSTOM FEED ON TILAPIA AND LETTUCE GROWTH IN AQUAPONIC SYSTEMS. Jackson Barnes* and Marc Albrecht, Department of Biology, University of Nebraska-Kearney, Kearney, NE 68849
- 4:50 23. COMPARISON OF COMMERCIAL AQUAPONIC SYSTEMS: PATENTED VS RECLAIMED. Cody Willmore*, Nate Bickford, and Marc Albrecht, Department of Biology, University of Nebraska at Kearney, Kearney, NE 68849

SESSION D

Session Chairperson: Joe Dolence, University of Nebraska at Kearney
Smith Callen Conference Center

- 1:00 1. ISOLATION OF THE MAJOR OUTER MEMBRANE PROTEIN FROM *CHLAMYDIA TRACHOMATIS* FOR FUTURE VACCINE DEVELOPMENT. Gustavo Zardeneta^{2*}, Douglas Christensen¹, Kristy Hansen¹, ¹Department of Biology, ²Department of Chemistry, Wayne State College, Wayne, NE 68787
- 1:10 2. EXAMINING THE POTENTIAL OF *LISTERIA MONOCYTOGENES* IN LB AS A TOOL FOR DRUG UPTAKE. Josephine Peitz*, Shawn Percy, and Douglas Christensen, Department of Biology, Wayne State College, NE 68787
- 1:20 3. SUBTOXIC EFFECTS AND MECHANISMS OF METAL NANOPARTICLES ON HUMAN CELLS. Michael Merial, Department of Biology, Nebraska Wesleyan University, 5000 Saint Paul Ave. Lincoln, NE 68504
- 1:30 4. DESIGN AND EVALUATION OF CNS TARGETED ANTIRETROVIRAL NANOPARTICLES. Andrew Kochvar^{*1}, Matthew Pon¹, Anne Marie Backer¹, Subhra Mandal², Christopher Destache², Annemarie Shibata¹, ¹Department of Biology, ²School of Pharmacy and Health Professions, Creighton University, Omaha, NE 68178
- 1:40 5. EFFECTS OF HUMAN HOLO-TRANSFERRIN CONJUGATED NANOPARTICLES ON PRIMARY CORTICAL ASTROCYTES, BV2 MICROGLIA, AND PRIMARY RAT NEURONS *IN VITRO*. Anne Marie Backer¹, Andrew Kochvar¹, Matthew Pon¹, Subhra Mandal², Christopher Destache², Annemarie Shibata¹, ¹Department of Biology, ²School of Pharmacy and Health Professions, Creighton University, Omaha, NE 68178
- 1:50 6. QUANTUM DOTS FOR SIMULTANEOUS ASSESSMENT OF ROS AND RADIOSENSITIZATION OF BRAIN CANCER CELLS. Kimal Honour Djam*, Michael Merrick, Haris Akhter, Catherine Weeder and Dr Andrew Ekpenyong, Department of Physics, Creighton University, Omaha, NE 68124
- 2:00 7. IMPROVING TREATMENT OF NEUROBLASTOMA WITH MIRNA. Eli Lundak*, Dr. Joseph Vetro Biology Department, Nebraska Wesleyan University, 5000 St. Paul Ave., Lincoln, NE 68504, Center for Drug Delivery and Nanomedicine, S 42nd St & Emile St, Omaha, NE 68198
- 2:10 8. INVESTIGATION OF CARNITINE PALMITOYLTRANSFERASE II DEFICIENCY IN NEURODEVELOPMENT. Delaney Wilton^{*1}, Rochelle Wickramasekara², Holly Stessman², and Annemarie Shibata, ¹Department of Biology, ²Department of Pharmacology and Neuroscience, Creighton University, NE, 68178
- 2:20 9. USING METABOLIC IMAGING TO QUANTIFY UVA-INDUCED DAMAGE IN SKH-1 MOUSE SKIN. Katie Sotelo*, Lindle Che, Marifel Gabriel, Kelsey Jackson, Dominick Myers, Molly Myers, Laura Hansen, Michael Nichols, Department of Physics, Creighton University, Omaha NE 68178

- 2:30 10. CORRELATING HISTOLOGY TO METABOLIC IMAGING DATA OF SKH-1 MOUSE SKIN. Molly S. Myers*, Dan L. Che, Marifel Frances Gabriel, Benjamin Huerter, Kelsey Jackson, Katie Sotelo, M.G. Nichols, L. Hansen Department of Physics, Creighton University, Omaha NE 68178
- 2:40 BREAK
- 2:50 11. CHITOSAN ACTS AS AN IMMUNE ACTIVATOR THROUGH STIMULATION OF INNATE IMMUNE SIGNALING PATHWAYS AND CYTOKINE EXPRESSION *IN VITRO*. Matthew D. Ballweg*^{1,2}, Anna T. Lampe^{1,2}, Eric Farris³, Angela K. Pannier³, Deborah M Brown^{1,2}, ¹School of Biological Sciences, University of Nebraska-Lincoln, Lincoln, NE, ²Nebraska Center for Virology, University of Nebraska-Lincoln, Lincoln, NE, ³Biological Systems Engineering, University of Nebraska-Lincoln, Lincoln, NE 68588
- 3:00 12. ANNUAL BUGGY CREEK VIRUS PHENOTYPE DYNAMICS IN SWALLOW BUGS (*OECIACUS VICARIUS*). Tyler Rollman*, T. Rowan, B. Ryan, C. Fassbinder-Orth, Department of Biology, Creighton University, Omaha, NE 68178
- 3:10 13. THE EFFECTIVENESS OF INFRARED CAMERA ON A CONSUMER DRONE (UAS) FOR WILDLIFE IMAGING. Jared Fischer* and Marc Albrecht, Department of Biology, University of Nebraska at Kearney, Kearney, NE 68849
- 3:20 14. POLLEN TUBE DEVELOPMENT IN WATER-POLLINATED *STUCKENIA PECTINATA*. Emma C. Baker*, Sabrina D. DuMond*, Neha Lamsal, Christie L. Dang, Mackenzie L. Taylor, Department of Biology, Creighton University, Omaha, NE 68178
- 3:30 15. DETERMINING THE PREVALENCE OF VECTORED PATHOGENS IN ELKHORN RIVER VALLEY *DERMACENTOR VARIABILIS* IN NEBRASKA. Caitlin Ingram*, Julie Shaffer, Brandon Luedtke, Department of Biology, University of Nebraska at Kearney, Kearney, NE 68849
- 3:40 16. DEVELOPMENT OF A SYSTEM TO SELECTIVELY RECRUIT CHROMATIN ARCHITECTURAL PROTEINS USING INDUCIBLE HETERODIMERS. Aubrey Schatz*, Brandon Gannon, Nicholas Scalora, and Brett J. Schofield, Department of Biology, Doane University, Crete, NE 68533
- 3:50 17. INSULATOR PROTEIN SCREEN IN *SACCHAROMYCES CEREVISIAE*. Keegan Whisler*, Nicholas Scalora*, Joe Larkin*, Aubrey Schatz, and Brett J. Schofield, Department of Biology, Doane University, Crete, NE 68533
- 4:00 18. GROWTH RATE OF A BIOFILM *ARTHROBACTER AURESCENS* TC1 SYSTEM GROWN IN GLUCOSE + ATRAZINE MINIMAL MEDIA. Kate Grint*¹ and Christopher D. Wentworth², ¹Department of Biology, ²Department of Physics & Engineering, Doane University, Crete, NE 68333
- 4:10 19. EFFECT OF ANDROGEN RECEPTOR ON SELF-GROOMING IN MICE. Tanner Johnson* and Nicholas Hobbs, Department of Biology, University of Nebraska at Kearney, NE 68849
- 4:20 20. CONSISTENCY OF BEHAVIORAL PLASTICITY ACROSS DIFFERENT SELECTIVE CONTEXTS. Dorsa Motevalli*, Alexandra Basolo, School of Biological Sciences, University of Nebraska-Lincoln, NE 68588

- 4:30 21. EVOLUTION OF A rRNA GROUP I INTRON IN THE LICHEN *TELOSCHISTES CHRYSOPHTHALMUS*. Audrey Codina* and Dawn M. Simon, Department of Biology, University of Nebraska Kearney, NE 68849
- 4:40 22. EFFECT OF DIETARY PROTEIN CONTENT ON THE RESPONSE TO OVER-MARKS AND ANDROGEN RECEPTOR EXPRESSION IN MICE. Kaitlyn Schultis* and Nicholas Hobbs, Department of Biology, University of Nebraska at Kearney, NE 68849
- 4:50 23. WHOLE-GENOME SEQUENCING AND DE NOVO ASSEMBLY OF ENVIRONMENTAL BACTERIA. Sydney Robertson and John Kyndt, Bellevue University, Bellevue, NE.

CHEMISTRY & PHYSICS

CHEMISTRY SECTION

Chairperson: Joshua Darr

Chemistry Department, University of Nebraska at Omaha
Olin LH-A

- 8:00 WELCOME
- 8:05 1. RAPID SCREENING OF DRUG-PROTEIN INTERACTIONS IN DIABETES BY HIGH-PERFORMANCE AFFINITY CHROMATOGRAPHY. Ashley G. Woolfork* and David S. Hage, Department of Chemistry, University of Nebraska-Lincoln.
- 8:25 2. PSEUDOMONAS AERUGINOSA GROWTH ON TITANIUM AND MODIFIED TITANIUM SUBSTRATES. Jaysa Hoins* and Chris Huber, Department of Chemistry, Doane University, Crete.
- 8:40 3. ANALYSIS OF SOFT DRINK ADDITIVES ON CARBON DIOXIDE NUCLEATION REACTION RATE IN AQUEOUS SOLUTIONS. Nathan P. Maginnis*, Mary E. Keithly, and Jennifer L. Balmat, Department of Mathematical and Natural Sciences, Chadron State College, Chadron.
- 8:50 4. BIO PRODUCTION OF ADIPIC ACID FROM LIGNIN-DERIVED AROMATICS USING ENGINEERED PSEUDOMONAS PUTIDA. Howard Willett*, Joshua Mueller, Bin Ma, Xinyuan He, and Wei Niu, Department of Chemical and Biomolecular Engineering, University of Nebraska-Lincoln
- 9:10 BREAK
- 9:25 5. CHALLENGES OF USING RATIONAL DESIGN TO OPTIMIZE SUBSTRATE SPECIFICITY FOR THE SURPRISINGLY PROMISCUOUS L-TYPE AMINO ACID TRANSPORTER (LAT1). Brooklynn Venteicher¹, Joseph Griffith^{1*}, Karissa Finke¹, Seth Springer¹, Laura Stoner¹, Evan Augustyn¹, Jerome Campbell¹, Colton Hall¹, Huan-Chieh Chien², Arik A. Zur², Claire Colas³, Kathleen M. Giacomini², Avner Schlessinger³, and Allen A. Thomas¹; 1. Department of Chemistry, University of Nebraska at Kearney; 2. Department of Bioengineering and Therapeutic Sciences, Schools of Pharmacy and Medicine, University of California San Francisco, San Francisco, CA, 94158; 3. Departments of Pharmacology and Systems Therapeutics and Structural and Chemical Biology, Icahn School of Medicine at Mount Sinai, New York, NY 10029

- 9:45 6. CURCUMIN, QUERCETIN AND THEIR COMBINATION FORMULATIONS: CHARACTERIZATION, RELEASE STUDIES, & ANTI-OXIDANT ACTIVITY. Christina Ternent*, College of St. Mary, Omaha.
- 10:05 7. WHEY PROTEIN AS A CARRIER FOR DELIVERY OF POORLY SOLUBLE ANTIOXIDANTS. Marlene Djidjoho*, Shambhavi Borde, Harsh Chauhan and Dunesh Kumari, Chemistry Department, College of Saint Mary, Omaha and School of Pharmacy and Health Professions, Creighton University, Omaha, NE
- 10:20 8. CHARACTERIZATION OF CARBOXYLIC ACID REDUCTASES AS CATALYSTS FOR BIOSYNTHESIS OF INDUSTRIAL CHEMICALS. Levi Kramer*, Erome Hankore, Yilan Liu, Kun Liu, Esteban Jimenez, Jiantao Guo, and Wei Niu, Department of Chemical and Biomolecular Engineering, University of Nebraska-Lincoln.
- 10:35 9. QUANTITATIVE ANALYSIS OF DIALLYL SULFIDE IN TWO GARLIC SUPPLEMENTS. Makala Michka*, Tim Keith, and Jennifer Balmat, Department of Mathematical and Natural Sciences, Chadron State College, Chadron.
- 11:00 MAIBEN LECTURE
- 1:00 10. EXAMINATION OF PAO1 BIOFILM COVERAGE USING FLUORESCENCE MICROSCOPY. Tanner Harsin* and Chris Huber, Department of Chemistry, Doane University, Crete.
- 1:15 11. IMPACT OF GOLD SURFACES ON THE ATTACHMENT AND PROLIFERATION OF PAO1 BIOFILMS. Chris Huber*, Department of Chemistry, Doane University, Crete.
- 1:30 12. MOLECULAR MODELING OF ISOFORM-SPECIFIC INHIBITION OF THE PEROXISOME PROLIFERATOR-ACTIVATED RECEPTOR PPAR γ : IDENTIFICATION OF PPAR γ ANTAGONISTS. Suliman Almahmoud¹*, Haizhen A. Zhong², Jeremy Jones³, Xiaofang Wang¹, and Jonathan L. Vennerstrom¹, ¹Department of pharmaceutical science, University of Nebraska Medical Center, Omaha, ²Department of Chemistry, the University of Nebraska at Omaha, ³Division of Molecular Pharmacology, City of Hope, Duarte, CA.
- 1:50 13. OBSERVATION OF CARBON DIOXIDE CLATHRATE HYDRATE WHISKER STRUCTURES. Avinash Kumar Both* and Chin Li Cheung, Department of Chemistry, University of Nebraska-Lincoln.
- 2:05 14. OPTIMIZING THE LINKER FOR LAT1-TARGETED PRODRUGS TO IMPROVE POTENCY AND CELLULAR UPTAKE. Hannah Way¹, Kasey Merklin¹, Jerome Campbell¹, Brooklynn Venteicher¹, Huan-Chieh Chien², Claire Colas³, Avner Schlessinger³, Kathleen M. Giacomini², Allen A. Thomas¹; 1. Department of Chemistry, University of Nebraska at Kearney, NE, 68849; 2. Department of Bioengineering and Therapeutic Sciences, Schools of Pharmacy and Medicine, University of California San Francisco, San Francisco, CA, 94158; 3. Departments of Pharmacology and Systems Therapeutics and Structural and Chemical Biology, Icahn School of Medicine at Mount Sinai, New York, NY 10029
- 2:15 15. QUALITATIVE AND QUANTITATIVE ANALYSIS AND IDENTIFICATION OF MENTHOL IN PEPPERMINT TEA. Princess Uba*, Tim Keith, and Jennifer Balmat, Department of Mathematical and Natural Sciences, Chadron State College, Chadron.
- 2:30 BREAK

- 2:45 16. DOCKING STUDIES OF BOUND LIGANDS AND FDA APPROVED DRUGS FOR MAPKAP KINASE-2 (MK-2) AS POTENTIAL ANTI-FLU TREATMENT. Michael Meyer* and H. Andy Zhong, Department of Chemistry, University of Nebraska at Omaha.
- 3:00 17. STEREOSELECTIVE SYNTHESIS OF HOMOALLYLIC ALCOHOLS BY DOUBLE HYDRIDE REDUCTION. Brianna L. Callahan and Martin Hulce*, Department of Chemistry, Creighton University, Omaha.
- 3:20 18. FLUOROPHORE SUBSTITUTED 1,2,3-TRIAZOLIUM SALTS. Connor A. Lejcher* and James T. Fletcher, Department of Chemistry, Creighton University, Omaha.
- 3:35 19. BIDENTATE CHELATORS WITH 1,2,3-TRIAZOLE AND ISOQUINOLINE SUBUNITS. Nicholas W. Kreofsky* and James T. Fletcher, Department of Chemistry, Creighton University, Omaha.
- 3:50 20. CAVITAND-MEDIATED PHOTOCYCLOADDITION OF ARYL-ETHYLENES AND ITS APPLICATION IN MANIFESTING SUPRAMOLECULAR INTERACTION. Mahesh Pattabiraman, University of Nebraska-Kearney, Kearney.
- 4:05 21. THE HYDROPATHY SCALE AS AN EFFECTIVE PREDICTOR OF THE INFLUENCE OF AMINO ACIDS ON THE HYGROSCOPIC PROPERTIES OF SODIUM CHLORIDE AEROSOLS. Joshua P. Darr*, Salvatore Gottuso, Mohammed Alfarra, David Birge, Kimberly Ferris, Dillon Woods, Paul Morales, Megan Grove, William K. Mitts, Eduardo Mendoza-Lopez, and Amissabah Johnson, Department of Chemistry, University of Nebraska at Omaha.
- 4:25 BUSINESS MEETING

CHEMISTRY AND PHYSICS

PHYSICS SECTION

Chairperson: Adam N. Davis
Wayne State College
Acklie Hall Room 320

- 9:00 Welcome
- 9:05 1. MODELLING OPTICAL LIGHT CURVES OF AGNS USING VARIABLE VISCOSITY PARAMETER. Shrey Ansh, Department of Physics, Creighton University, Omaha, NE 68718
- 9:15 2. INCOHERENT PHOTOPRODUCTION OF Φ -MESON IN ULTRA-PERIPHERAL PB+PB COLLISIONS AT $\sqrt{s_{NN}} = 5.02$ TEV. Amrit Gautam, Department of Physics, Creighton University, Omaha, NE 68718
- 9:30 3. SOFTWARE UPDATES TO STAR, THE SOLENOIDAL TRACKER AT RHIC (RELATIVISTIC HEAVY ION COLLIDER), AT BROOKHAVEN NATIONAL LABORATORIES. Emma Dufresne, Department of Physics, Creighton University, Omaha, NE 68718
- 9:40 4. CONSTRAINTS ON THE GEOMETRY OF QUASAR SPECTRA. Leo Moraczewski*, Jack Gable, Department of Physics, Creighton University, NE, 68178
- 9:50 5. BIG DATA ANALYTICS IN ASTRONOMY: APPLICATIONS IN QUASAR RESEARCH. Samantha Hughes* and Dr. Jack Gabel, Department of Physics, Creighton University, NE 68102

- 10:00 6. SEARCH FOR H_c PARTICLES IN HEAVY ION ULTRAPERIPHERAL COLLISIONS. Alec Peck, Department of Physics, Creighton University, NE 68102
- 10:15 7. MATHEMATICAL MODELING OF CELL ATTACHMENT AND MIGRATION FOR PHYSICS OF CANCER. Andrew Walther*, Michael Mimlitz, and Dr Andrew Ekpenyong, Department of Physics, Creighton University, NE 68102
- 10:25 8. SIMULATIONS OF AGN OUTFLOWS AS ACCRETION DISK WINDS. Margaret Johnston*, Jack Gabel, Department of Physics, Creighton University, NE 68102
- 1:20 9. BALLISTIC TESTS OF MULTILAYERED ARMORED COMPOSITES. Tyler Parthemer, Department of Physics, Hastings College, Hastings, NE 68901
- 1:40 10. DESIGN AND CONSTRUCTION OF AN ELECTRIC DRIVE SYSTEM FOR A DIRT BIKE. Ashton Oakman, Department of Physics, Hastings College, Hastings, NE 68901
- 2:00 11. HEAVY-LIFT AUTONOMOUS DRONE. Jason Finnegan, Department of Physics, Hastings College, Hastings, NE 68901
- 2:20 12. ANALYSIS OF THE ACCURACY AND FIRE REPEATABILITY OF A HIGH VELOCITY RAILGUN. Andrew Rutt, Department of Physics, Hastings College, Hastings, NE 68901
- 2:40 13. PHOTOMETRIC ANALYSIS OF BLAZARS. Lyndsay Ruane, Department of Physics, Hastings College, Hastings, NE 68901

EARTH SCIENCE

Chairperson: Irina Filina

Department of Earth and Atmospheric Sciences, University of Nebraska-Lincoln

Acklie Hall Room 007

- 1:00 WELCOME
- 1:05 1. INVESTIGATING THE ONSET OF THE CAMPANIAN–MAASTRICHTIAN BOUNDARY EVENT AT DSDP HOLE 762C USING CALCAREOUS NANNOFOSSIL BIOMETERICS AS A TEMPERATURE PROXY. Shamar Chin* and David K. Watkins, Department of Earth and Atmospheric Sciences, University of Nebraska at Lincoln, 68588
- 1:25 2. PALEONTOLOGY LOCALITY RECORDS. Robert L. Evander, 1218 West 4th, Hastings NE 68901
- 1:40 3. A MOPHOMETRIC STUDY OF RABBITS FROM THE WHITE RIVER AND ARIKAREE GROUPS (CHADRONIAN THROUGH ARIKAREEAN) IN THE PANHANDLE OF NEBRASKA AND SOUTHERN SOUTH DAKOTA. Maria Peterson* and Michael B. Leite, Department of Mathematical and Natural Sciences, Chadron State College, Chadron, NE 69337
- 1:50 4. DETERMINATION OF HEAVY METAL SPECIES IN RESERVOIR SEDIMENTS OF THE PINE RIDGE-BLACK HILLS REGION, NEBRASKA AND SOUTH DAKOTA, USA. Gregory L. Peterson*, Tim Keith, Jennifer L. Balmat, Michael B. Leite Department of Mathematical and Natural Sciences, Chadron State College, Chadron, NE 69337

- 2:05 5. THE CONTACT BETWEEN PEORIA LOESS AND THE GILMAN CANYON FORMATION IN THE KEARNEY AREA, SOUTH-CENTRAL NEBRASKA. Jeremy S. Dillon*, Zachary Albrecht, Claire Christner, Theodore Degner, and Brian Guerra, Department of Geography, University of Nebraska at Kearney, NE 68849
- 2:20 BREAK
- 2:30 6. SUDDEN SEISMICITY SPIKE IN CENTRAL NEBRASKA IN 2018. Irina Filina*, Kris Guthrie, Caroline M. Burberry and Mindi Searls, Department of Earth and Atmospheric Sciences, University of Nebraska – Lincoln, NE 68588
- 2:45 7. VARIATIONS IN SUBSURFACE SEISMIC VELOCITIES IN CENTRAL NEBRASKA DETERMINED FROM 2018 EARTHQUAKE CLUSTER. Hannah Botten*, Irina Filina, Department of Earth and Atmospheric Sciences, University of Nebraska – Lincoln, NE 68588
- 3:00 8. GEOPHYSICAL ANALYSIS OF THE MIDCONTINENT RIFT’S SUBSURFACE STRUCTURES IN SOUTHEASTERN NEBRASKA. Patrick Szopinski*, Irina Filina, Department of Earth and Atmospheric Sciences, University of Nebraska – Lincoln, NE 68588
- 3:15 9. ASSEMBLING THE HUSKER SEISMOMETER. Evan Parsons*, Irina Filina, Department of Earth and Atmospheric Sciences, 68588 and Anatoly Mironov, Department of Physics and Astronomy, University of Nebraska at Lincoln, NE 68588
- 3:30 10. DEVELOPING A DRONE-BASED MAGNETIC FIELD SURVEYING SYSTEM. Erik Jacobson*, Irina Filina, Department of Earth and Atmospheric Sciences, University of Nebraska at Lincoln, NE 68588
- 3:45 ADJOURN

ENVIRONMENTAL SCIENCES

Chairperson: Mark Hammer
Wayne State College
Acklie Hall Room 111

- 1:00 WELCOME
- 1:05 1. BERGMANN’S RULE TESTED ON SNAKES NATIVE TO THE UNITED STATES AND CANADA Ria Shome*, Dr. Gary Gerald, Department of Biology, Nebraska Wesleyan University, 5000 St. Paul Avenue, Lincoln, NE 68504
- 1:25 2. DEVELOPING AN EXTRACTION METHOD FOR HPLC DETECTION OF ARTHROBACTER AURESCENS TC1 ATRAZINE BIOREMEDIATION Hunter Kleinschmidt, Jared Hass, Michael Kangas, Christopher Wentworth, Chris Huber, Andrea E Holmes, Arin L. Sutlief*, Doane University, Crete, NE.
- 1:40 3. PHYTOREMEDIATION OF HEAVY METAL CONTAMINANTS Kristy Hansen*, Mark Hammer, Department of Biology, Wayne State College, Wayne, NE 68787

- 1:50 4. HABITAT SELECTION AND SPATIAL DISTRIBUTION OF EASTERN COTTONTAIL RABBITS IN A FRAGMENTED AGRICULTURAL LANDSCAPE. Jourdan M Ringenberg*, Nate Bickford, Matt Bice, and Dustin H Ranglack, Department of Biology, University of Nebraska at Kearney, NE 68849

TEACHING OF SCIENCE AND MATH

Chairperson: Josef Kren

Bryan College of Health Sciences, Lincoln

Acklie Hall Room 218

1:00 WELCOME

- 1:05 1. ADDING RELEVANCE TO A NONMAJORS BIOLOGY COURSE. Phyllis Higley, College of Saint Mary, Omaha, NE.
- 1:20 2. APPLICATIONS OF A RANKING TASK EDITOR IN ASTRONOMY EDUCATION. Brandon T. Harper*, Christopher M. Siedell, and Kevin M. Lee, University of Nebraska – Lincoln, NE.
- 1:35 3. GROWING PATHWAYS TO STEM: USING RESEARCH FRAMEWORKS, COMMUNITY PARTNERSHIPS, AND INTENSIVE MENTORING TO EXPAND STEM CAREER PATHWAYS FOR RURAL COMMUNITY COLLEGE STUDENTS. Lauren M. Gillespie* and Steve Heinisch, Department of Academic Education, Central Community College, Columbus, NE. Neal Grandgenett, Department of STEM Education, College of Education, University of Nebraska-Omaha, NE.
- 1:50 4. WHAT CURRENT RESEARCH CAN TEACH MEDICAL PERSONNEL ABOUT SEPSIS MANAGEMENT AND TREATMENT. Emily Klein*, Britta Robinson, Ashley Holm and Bri Aguilar. Bryan College of Health Sciences, Lincoln, NE.
- 2:05 5. USING DEMONSTRATION VIDEOS. Emily A. Welch*, Kevin M. Lee and Lisa Pytlik-Zillig, Department of Physics and Astronomy, University of Nebraska - Lincoln, NE.
- 2:25 6. MAKING “SCENTS” OF ESTER CHEMISTRY: DEVELOPING A SOPHOMORE ORGANIC CHEMISTRY LABORATORY. Martin Hulce, Department of Chemistry, Creighton University, Omaha, NE.

COLLEGIATE ACADEMY

BIOLOGY

Chairperson: Therese McGinn

Nebraska Wesleyan University, Lincoln

SESSION A

Olin Hall Room 111

- 8:36 1. USING HYBRIDIZATION AND SELECTION TO EFFECTIVELY DEVELOP IMAZAMOX-RESISTANT WHEAT. Laurel Heskett*¹, P. Stephen Baenziger², ¹Department of Biology, Nebraska Wesleyan University, NE 68504. ²Department of Agronomy and Horticulture, University of Nebraska at Lincoln, NE 68503

- 8:48 2. MICROPLASTIC POLLUTION IN SALT CREEK SURFACE WATERS: QUANTITY AND COMPOSITION. Margaret A. Eubanks*¹, Jerald S. Bricker¹, Shannon L. Bartelt-Hunt², and Daniel D. Snow², ¹Department of Biology, Nebraska Wesleyan University, Lincoln, NE 68504, ²University of Nebraska – Lincoln
- 9:00 3. TRANSCRIPTOME ASSEMBLY AND DIFFERENTIAL GENE EXPRESSION ANALYSIS OF THE COMMON CORN SNAKE, PANTHEROPHIS GUTTATUS. Dan Novinski*, Adrienne Prokupek-Pickett, and Gary Gerald, Department of Biology, Nebraska Wesleyan University at Lincoln, NE 68504
- 9:12 4. THE ADAPTIVE FUNCTION OF COTTONTAIL RABBIT (SYLVILAGUS FLORIDANUS) TAIL-FLAGGING USED TO AVOID PREDATION. Bailey Hallgren Meehan*, Cody Arenz, and Gary Gerald, Department of Biology, Nebraska Wesleyan University, 5000 St. Paul Ave, NE 68504
- 9:24 5. EFFECTS OF A LARGE MEAL ON THE LIMBLESS LOCOMOTION OF THE COMMON CORN SNAKE (PANTHEROPHIS GUTTATUS). Brooke Henson*, Ria Shome, Carmen Juan, Connor Springman, and Gary Gerald, Department of Biology, Nebraska Wesleyan University, 5000 Saint Paul Ave Lincoln, NE 68504
- 9:36 6. THE EFFECTS OF CAFFEINE AND EXERCISE ON ULNAR NEURAL IMPULSE SPEEDS. Kai Friesen*, Cindy Marolf, Gary Gerald, Department of Biology, Nebraska Wesleyan University, Lincoln, NE 68504

COLLEGIATE ACADEMY
BIOLOGY

Chairperson: Angela McKinney
Nebraska Wesleyan University, Lincoln

SESSION B
Olin LH-B

- 8:00 1. EVALUATION OF THE “TAIL DROP” HYPOTHESIS IN HUMAN CHASED SYLVILAGUS FLORIDANUS IN NEBRASKA. Margaret Polland*, Cody Arenz, and Gary Gerald, Nebraska Wesleyan University, Lincoln, NE.
- 8:12 2. AGGRESSIVE PREWARMING MEASURES DECREASED PERIOPERATIVE HYPOTHERMIA IN OUTPATIENT SURGERY CENTER PATIENTS. Tara Benes, Department of Biology, Nebraska Wesleyan University, NE 68504
- 8:24 3. THE EFFECTS OF CAFFEINE ON BRAIN ACTIVITY POST-EXERCISE. Dalton McGerr, Department of Biology, Nebraska Wesleyan University at Lincoln, NE 68504
- 8:36 4. EFFECTS OF LEG POSITION AND TIME ON THE LOCOMOTION OF SPIDERS (PHOLCUS MANUELI) AFTER AUTOTOMY. Mariah M. Fallick*, Clement Bonnardel, Gary W. Gerald, Department of Biology, Nebraska Wesleyan University, 5000 Saint Paul Ave, Lincoln, NE 68506

- 8:48 5. MUNICIPAL WASTEWATER AS A SOURCE OF MICROPLASTIC POLLUTION IN SALT CREEK SEDIMENTS. Aly B. Johnson*¹, Jerald S. Bricker¹, and Daniel D. Snow², ¹Department of Biology, Nebraska Wesleyan University, NE 68504, ²School of Natural Resources, University of Nebraska at Lincoln, NE 68588
- 9:00 6. EFFECTS OF PEDIATRIC CONGENITAL HEART DISEASE ON KBIT-2 SCORES COMPARED TO HEALTHY CHILDREN. Alexander Vraspir*^{1,2}, Holly Roberts², Howard Needelman², ¹Department of Biology, Nebraska Wesleyan University, Lincoln, NE, 68504, ²Munroe-Meyer Institute for Genetics and Rehabilitation, University of Nebraska Medical Center, Omaha, NE, 68105
- 9:12 7. ESCHERICHIA COLI CAUSING URINARY TRACT INFECTIONS AND DIARRHEAL DISEASES. Julia Bartolome* and D. Michael Olive, Department of Biology, Nebraska Wesleyan University, NE 68504
- 9:24 8. EFFECTS OF CAFFEINE COUPLED WITH EXERCISE ON GRIP STRENGTH AND REACTION TIME. Grant Albers, Department of Biology, University of Nebraska Wesleyan, Lincoln, NE, 68504
- 9:36 9. COMPARISON OF ANTIBIOTIC RESISTANCE AND VIRULENCE GENES IN ESCHERICHIA COLI ISOLATED FROM STUDENT HEALTHCARE WORKERS AND STUDENT NON-HEALTHCARE WORKERS. Tress Nelson* and Michael Olive, Department of Biology, Nebraska Wesleyan University, NE 68504
- 9:48 BREAK
- 10:00 10. INTEGRIN ALPHA 8 AND PROTOCADHERIN-15 KNOCKDOWNS IN OC-1 STEREOCILIA ASSOCIATED WITH USHER'S SYNDROME. Nate Teitler*^{1,2}, Marissa Zalocchi¹, ¹Boys Town National Research Hospital, Molecular Genetics Lab, 555 N 30th St, Omaha, NE 68131, ²Department of Biology, Nebraska Wesleyan University, 5000 St. Paul Ave, NE 68504
- 10:12 11. BACTERIOPHAGE MS2 AS A SURROGATE MODEL FOR STUDYING NOROVIRUS. Grant Bednar*, Michael Olive, Department of Biology, Nebraska Wesleyan University, NE 68504
- 10:24 12. PRO-INFLAMMATORY EFFECTS AND CYTOTOXICITY OF ACETALDEHYDE AND MALONDIALDEHYDE. Tyler Sharp*^{1,2}, ¹Department of Internal Medicine, University of Nebraska Medical Center, Omaha, NE, 68131, ²Department of Biology, Nebraska Wesleyan University, Lincoln, NE, 68504
- 10:36 13. TRADE-OFFS BETWEEN WINGSPAN AND LIFE HISTORY TRAITS IN BIRDS. Karrie Sestak* and Gary Gerald, Nebraska Wesleyan University, Lincoln, NE
- 11:00 MAIBEN LECTURE

- 1:00 14. NITROGEN FIXERS IN THE MAIZE RHIZOSPHERE AND ANALYSIS OF THEIR MBOA SENSITIVITY. Frederick Azalekor*, Florian Wurtele, Martha Lopez-Guerrero, and Karin van Dijk, Department of Biochemistry, University of Nebraska at Lincoln, NE 68588
- 1:12 15. PSEUDOMONAS AERUGINOSA PERSISTENT CELL QUANTIFICATION USING A MICROFLUIDIC DEVICE. Marco Perez, Doane University, Crete, NE.
- 1:24 16. COMPARISON OF GROWTH RATES OF SUSPENDED AND BIOFILM CELLS OF PROTEUS MIRABILIS GROWN IN TSB. Michael Wieduwilt*¹ and Christopher D. Wentworth², Doane University, Crete, NE 68333, ¹Department of Biology, ²Department of Physics & Engineering
- 1:36 17. FOURIER ANALYSIS OF MICROSCOPIC IMAGES OF PSEUDOMONAS AERUGINOSA BIOFILMS GROWN UNDER CHANGING SHEAR STRESS CONDITIONS. Sarah Vaughn* and Christopher D. Wentworth, Department of Physics & Engineering, Doane University, Crete, NE 68333
- 1:48 18. BREEDING BLUEBIRDS AND INVASIVE ANTS: INFLUENCE OF RESOURCE COMPETITION OR PREDATION ON NESTLING SEX RATIOS. Andrew Herley*, Lauren M. Gillespie*, Department of Academic Education, Central Community College, Columbus, NE, 68602, Paige Reimers, University of Nebraska-Lincoln, Lincoln, NE 68588, Lynn Siefferman, Dept. of Biology, Appalachian State University, Boone, NC 28608
- 2:00 19. DESCRIPTION OF POSSIBLE HYBRID BARN X CLIFF SWALLOWS IN EAST CENTRAL NEBRASKA IDENTIFIED VIA ANOMALOUS PLUMAGE VARIATION. Kayla Kreizel*, Elizabeth Ewing, Alejandro Espino, Jenessa Grooms, Alex Koch, Steve Heinisch, Lauren Gillespie*, Department of Academic Education, Central Community College, Columbus Nebraska, 68602.
- 2:12 20. ANALYSIS OF RNAseq DATA REVEALS MEDIA STATE DEPENDENT TRANSCRIPT PROFILE IN CANDIDA ALBICANS. Patricia Harte-Maxwell, Department of Biology, University of Nebraska at Omaha, NE 68182
- 2:24 BREAK
- 2:36 21. DAY TO DAY AND LEG TO LEG VARIATION IN SKELETAL MUSCLE GENE EXPRESSION. Zohal Alizai, University of Nebraska-Omaha, Omaha, NE.
- 2:48 22. ESTROGEN POSITIVELY AFFECTS SPATIAL DISCRIMINATION IN ADULT FEMALE OVARECTOMIZED RATS. Raissa Souza*^{1,2}, Sejal Chudasama², Justin Garrel², Henry Blair², and Jana Veliskova², ¹Biology Department, Nebraska Wesleyan University, NE 68504. Dept of Cell Biology, ²New York Medical College, NY 10595
- 3:00 23. DEFINING NEUROLOGICAL DISABILITY IN SJÖGREN-LARSSON SYNDROME AND THE SEARCH FOR A BIOMARKER. William B. Rizzo and Morgan L. Zabel*, Department of Pediatrics, University of Nebraska Medical Center, 42nd and Emile St., Omaha, NE 68198 and the Department of Biology, Nebraska Wesleyan University, 5000 St. Paul Ave, Lincoln, NE 68504.

- 3:12 24. ACTIVITY OF METABOLIC ENZYMES IN SERPENTINE SKELETAL MUSCLE RESULTING FROM DIFFERENT METHODS OF LIMBLESS LOCOMOTION. Paul Wurtz, Department of Biology, Nebraska Wesleyan University, Lincoln, NE, 68504
- 3:24 25. SKELETAL MUSCLE MITOCHONDRIAL BIOGENESIS IN RESPONSE TO EXERCISE AND COLD EXPOSURE. Camille Larson*, Megan Vande Hei, and Dustin Slivka, Department of Health and Kinesiology, University of Nebraska at Omaha, NE 68182
- 3:36 26. IMPACTS OF EXERCISE AND ENVIRONMENTAL TEMPERATURE ON MITOCHONDRIAL QUANTITY AND QUALITY. Halee Keller*, Robert Shute, Dustin Slivka, University of Nebraska-Omaha, Omaha, NE

COLLEGIATE ACADEMY
CHEMISTRY AND PHYSICS
 Chairperson: Nathanael Fackler
 Nebraska Wesleyan University, Lincoln
 Acklie Hall Room 007

8:25 WELCOME

- 8:30 1. TRACKING UV-INDUCED CANCER DEVELOPMENT USING A MULTI-PHOTON PHASOR FLUORESCENCE LIFETIME IMAGING MICROSCOPY SETUP. Kelsey A. Jackson*, Marifel F. Gabriel, Dominick M. Myers, Molly Myers, Katie D. Sotelo, Laura Hansen, Michael Nichols, Department of Physics, Creighton University, NE 68178.
- 8:47 2. MULTI-PHOTON FLUORESCENCE LIFETIME IMAGING MICROSCOPY OF NAD(P)H PHASOR ANALYSIS CHARACTERIZES THE METABOLIC CHANGES IN CHRONIC UVA EXPOSED SKH-1 MICE. Marifel F. Gabriel*, Kelsey A. Jackson, Dominick M. Myers, Molly S. Myers, Katie D. Sotelo, Lindle D. Che, Laura Hansen, Michael G. Nichols, Department of Physics, Creighton University, NE 68178.
- 9:05 3. IDENTIFYING THE BINDING LOCATION OF ATRAZINE AND ITS METABOLITES ON HSA USING HIGH PERFORMANCE AFFINITY CHROMATOGRAPHY. Kati Frankenberg* and Annette C. Moser, Department of Chemistry, University of Nebraska at Kearney, NE 68849.
- 9:22 4. INTRODUCTION TO EPICS-BASED CONTROLS FOR THE STAR EXPERIMENT AT BROOKHAVEN NATIONAL LABORATORY. Raelynn McCreary, Creighton University, Omaha, NE 68178.
- 9:35 5. FEASIBILITY OF MEASURING THE Φ MESON PHOTOPRODUCTION IN ULTRA-PERIPHERAL COLLISIONS AT STAR. Ethan Wahle, Creighton University, Omaha, NE 68178.
- 9:47 6. USING AMINO ACIDS IN THE FIGHT AGAINST ANTIBIOTIC RESISTANCE. Caitie Lemmons*, Jonah Scheffler, and David Peitz, Chemistry, Wayne State College, 1111 Main St., Wayne, NE.
- 10:05 7. UPGRADES TO SAFETY SYSTEM SOFTWARE FOR THE STAR EXPERIMENT SLOW CONTROLS AT BROOKHAVEN NATIONAL LABORATORY. Joey D'Alesio and Sam Ruiz, Creighton University, Omaha, NE 68178.

10:22 8. NANOPARTICAL PALLADIUM HYDROGENATION CATALYSIS OF ALKYNES. THE VINYL REVERSAL AND HORIUTI-POLANYI MECHANISMS. Mackenzie Enmeier*, Kara Grossman, Grace Recker, Katie Cunningham, and Bruce Mattson, Department of Chemistry, Creighton University, Omaha, NE 68178.

11:00 MAIBEN LECTURE

AWARDS PRESENTATIONS/MAIBEN LECTURE PROGRAM

\$1500 COLLEGIATE SCHOLARSHIPS

Due to the generosity of the C. Bertrand and Marian Othmer Schultz Endowment the Nebraska Academy of Sciences has been able to fund two \$1500 collegiate scholarships for the 2019-2020 academic year. Applicants must be planning a career in basic science or science teaching and submit an application letter detailing their career plans.

C. Bertrand and Marian Othmer Schultz Collegiate Scholarship Andrew Pham, University of Nebraska at Omaha

“My career goals now include going to graduate school and getting a doctorate... The field is still unknown to me, but I lean towards the realm of biochemistry and molecular biology because of the fundamental knowledge they contribute to the rest of science. The goal is to work in research and development for an industrial company. I would start off smaller but hopefully work my way up to contribute to the actual design of experiments. Whether it is at some big commercial biotech company or a small start-up company is still unbeknownst to me.”

C. Bertrand and Marian Othmer Schultz Collegiate Scholarship Dylan George, Peru State College

“... I plan on pursuing my PhD in tropical infectious diseases because I feel many of my peers fail to see its significance. Science is not obligated to help the planet, but scientists are. The methods by which we understand our reality are separate from the people who do it. I refuse to sit by and watch the suffering of my fellow human beings. I want to use my knowledge to find treatments and cures for the abominable diseases that unevenly affect the destitute. I hope to become a professor after completing my PhD and working at an institution that will allow me to teach as well as conduct research... Being able to take a student and teach them everything I know and help foster the next generation of scientists is something I am passionate about and I feel will be the most rewarding part of my future career.”

HIGH SCHOOL SCHOLARSHIPS

The Nebraska Academy of Sciences awards up to six different scholarships for high school seniors each spring varying from \$100 to \$750. Students must submit an essay on a topic specific to the scholarship they apply for, as well as a letter of acceptance to a Nebraska college or university, letters of recommendation, and other information specific to each scholarship. Three scholarships are being awarded this spring.

Loren Eiseley Memorial Scholarship
Rylee Schurman
Lincoln North Star High School, Lincoln, NE

Robert S. Kubicek Memorial Scholarship
Daniel Stara
Aquinas High School, David City, NE

Marian Schultz Memorial Environmental Scholarship
Chad Niemeier
Tri County Public Schools, DeWitt, NE

Lincoln Gem and Mineral Scholarship
Ryker Van Brocklin
Hastings Senior High School, Hastings, NE

NEBRASKA ACADEMY OF SCIENCES
FRIEND OF SCIENCE AWARD WINNERS

YEAR	WINNER	YEAR	WINNER
2019	Julie Thomas, Lincoln	2003	Tranda Fischelis, Philadelphia, PA
2019	Kevin Lee, Lincoln	2002	Robert and Martha Kaul, Lincoln
2018	Mary Kalen Romjue, Orlando, FL	2001	Henry Baumgarten, Lincoln
2018	Michael Sibbernsen, Lincoln	2001	Claire Oswald, Omaha
2017	Kacie Baum, Omaha	2000	David T. Lewis, Lincoln
2017	Todd Young, Wayne	1999	Albert W. Zechman, Lincoln
2016	Randall Lienemann, Hildreth	1998	Robert B. Nelson, Lincoln
2016	James Turpen, Omaha	1997	Francis A. Haskins, Lincoln
2015	David Dow, Omaha	1997	Robert B. Johnston, Lincoln
2015	James Woodland, Omaha	1997	M. Rosalind Morris, Lincoln
2014	Dan Sullivan, Omaha	1996	Mylan T. & Eunice Earhart Stout, Lincoln
2014	Mike Voorhies, Lincoln	1995	C. Bertrand Schultz, Lincoln – A farewell, rather than award
2013	James Carr, Lincoln	1994	Donald Othmer, Brooklyn, NY
2013	Aurietha Hoelsing, Omaha	1993	Robert Crosby, Lincoln
2012	Maurice Godfrey, Omaha	1993	Virginia Smith, Chappell
2012	Mary H. Pritchard, Lincoln	1992	Florence Boring Lueninghoener, Fremont
2011	Elizabeth Mulkerrin, Omaha	1989	Robert W. Allington, Lincoln
2011	William Wehrbein, Lincoln	1984	Lewis E. Harris, Lincoln
2010	John Rosenow, Lincoln	1981	Mr. & Mrs. Thomas C. Woods, Jr., Lincoln
2010	Nancy Rosenow, Lincoln	1980	George & Olivia Lincoln, Lincoln
2009	Lois Mayo, Lincoln	1977	Vance D. Rogers, Lincoln
2009	Carol Wipf, Lincoln	1976	Walter D. Behlen, Columbus
2008	Dave Goss, Lincoln	1970	Mabel L. Criss, Omaha
2008	Susan Seacrest, Lincoln		
2007	Mary Ettel, Wayne		
2007	Robert Reeder, Lincoln		
2006	Ed Brogie, Wayne		
2006	Judy Williams, Central City		
2005	Charles Lang, Uehling		
2005	Kathleen Jacobitz, Pawnee City		
2004	Charles Holliday, Omaha		

FRIEND OF SCIENCE AWARD TO JULIE THOMAS



Julie Thomas currently serves as the Interim Dean for Research in the College of Education and Human Sciences at the University of Nebraska-Lincoln. Beginning with her elementary teaching experiences in rural and urban Nebraska classrooms (14 years), Thomas recognized children's science enthusiasm and decided to pursue a doctoral degree in science education. Now, as a university professor (24 years), Thomas enjoys research and teaching related to elementary science education. She has led numerous funded projects and published research focused on children's science learning and teacher professional development. Proud accomplishments include collaborative efforts – such as *No Duck Left Behind*, a partnership with waterfowl biologists to promote wetland education efforts, and *Engineering is Everywhere (E²)*, a partnership with a materials engineer to develop a time-efficient model for STEM career education.

Throughout her teaching career, Thomas has been actively involved in national and international professional associations such as the School Science and Mathematics Association (SSMA-Past Executive Director), National Science Teachers' Association (NSTA-Awards and Nominations Committees), the Council for Elementary Children International (CESI-Past President). In Nebraska, Thomas has been a long-time member of the Nebraska Association of Science Teachers (NATS) having served on the board from 1991-92 and continuing as a NATS conference presenter. Thomas continues her science education leadership as the NJAS Director of the Southeast Regional Science Fair.

FRIEND OF SCIENCE AWARD TO KEVIN LEE



Kevin Lee is a Research Associate Professor at the University of Nebraska-Lincoln (UNL). His appointment is shared by an academic department where his duties focus on instruction and an educational center where he works on curriculum development, outreach, teacher training, and technology support.

He oversees the Astronomy Education at the University of Nebraska web site at <http://astro.unl.edu> which houses computer simulations, a library of dynamic peer instruction questions, a suite of interactive ranking and sorting tasks, and a growing library of astronomy demonstration videos available on YouTube. The simulations have been used globally by astronomy faculty for more than 10 years. This work was largely responsible for Kevin winning the AAPT's Halliday and Resnick Award for Excellence in Undergraduate Physics Teaching in 2012.

Kevin has organized an annual workshop in astronomy education each fall for over 15 years. This workshop has been held jointly with the fall meeting of the Nebraska Chapter of the American Association of Physics Teachers. He recently has returned to UNL after a three-year stint as a rotating program officer in the National Science Foundation's Division of Undergraduate Education.

MAIBEN LECTURER
DR. DAVID SWANSON
University of Nebraska-Lincoln



David R. Swanson received his BS degree in Chemistry with a minor in Mathematics from Nebraska Wesleyan University in 1987 and obtained a Ph.D. in computational chemistry at the University of Nebraska-Lincoln in 1995. He then served as an NSF-NATO Postdoctoral Fellow in theoretical chemistry at the Technical University of Wroclaw (Poland), and an NRC Postdoctoral Fellow at the Naval Research Lab in Washington, DC. He has studied and simulated organic monolayers and energetic materials but has focused primarily on advanced distributed computing in several collaborative projects since returning to UNL in 1999.

David has been the Director of the Holland Computing Center (HCC) at the University of Nebraska-Lincoln (UNL) for the last 10 years, where he is a Research Professor in Computer Science and Engineering. As Director of HCC he oversees staff and resources that currently serve over 1000 researchers from across the four campuses of the University of Nebraska (NU) system and the state of Nebraska. UNL was awarded a U.S. CMS Tier2 site 15 years ago which led to an ongoing close connection with the Open Science Grid (OSG), a national consortium for distributed data intensive computational science. Swanson currently serves as Chair of the OSG Council and manages the HCC Virtual Organization for NU campus researchers; HCC campus resources have been opportunistically shared with OSG researchers for several years.

This talk will summarize the changes in computational science over the last 20 years from the vantage point of a collaborating campus resource provider. A statewide computational coalition will be proposed, and HCC's role in some of the most exciting science of our time will be recounted.

NEBRASKA ASSOCIATION OF TEACHERS OF SCIENCE (NATS)

The 2019 Fall Conference of the Nebraska Association of Teachers of Science (NATS) will be held at the Younes Conference Center, Kearney, NE, September 19-21, 2019.

President: Betsy Barent, Norris Public Schools, Firth, NE

President-Elect: Anya Covarrubias, Grand Island Public Schools, Grand Island, NE

AFFILIATED SOCIETIES OF THE NEBRASKA ACADEMY OF SCIENCES, INC.

1. American Association of Physics Teachers, Nebraska Section

Web site: <http://www.aapt.org/sections/officers.cfm?section=Nebraska>

2. Friends of Loren Eiseley

Web site: <http://www.eiseley.org/>

3. Lincoln Gem & Mineral Club

Web site: <http://www.lincolngemmineralclub.org/>

4. Nebraska Chapter, National Council for Geographic Education

5. Nebraska Geological Society

Web site: <http://www.nebraskageologicalsociety.org>

Sponsors of a \$50 award to the outstanding student paper presented at the Nebraska Academy of Sciences Annual Meeting, Earth Science /Nebraska Chapter, Nat'l Council Sections

6. Nebraska Graduate Women in Science

7. Nebraska Junior Academy of Sciences

Web site: <http://www.nebraskajunioracademyofsciences.org/>

8. Nebraska Ornithologists' Union

Web site: <http://www.noubirds.org/>

9. Nebraska Psychological Association

<http://www.nebpsych.org/>

10. Nebraska-Southeast South Dakota Section Mathematical Association of America

Web site: <http://sections.maa.org/nesesd/>

11. Nebraska Space Grant Consortium

Web site: <http://www.ne.spacegrant.org/>

**THE NEBRASKA SPACE GRANT CONSORTIUM MADE A GENEROUS CONTRIBUTION
TO THE ACADEMY TO HELP DEFRAY COSTS OF THIS MEETING**