PROGRAM
and
PROCEEDINGS

THE NEBRASKA ACADEMY
OF
SCIENCES
1880-2014

including the

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

134th Anniversary Year

One Hundred-Twentyfourth Annual Meeting

April 11, 2014
OLIN HALL OF SCIENCE - NEBRASKA Wesleyan University
LINCOLN, NEBRASKA
The 2014 Fall Conference of the Nebraska Association of Teachers of Science (NATS) will be held at Camp Calvin Crest, near Fremont, September 25 - September 27 (Thursday, Friday, and Saturday).

President: Katie Ramsey, Grand Island Public Schools, Grand Island, NE
President-Elect: Joe Myers, Norfolk High School, Norfolk, NE

AFFILIATED SOCIETIES OF THE NEBRASKA ACADEMY OF SCIENCES, INC.

1. American Association of Physics Teachers, Nebraska Section
   Web site: http://www.ne-aapt.org/

2. Friends of Loren Eiseley
   Web site: http://www.loreneiseley.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://maps.unomaha.edu/ngs/
   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 Ornithologists’ Union
   Web site: http://www.noubirds.org/
   Publishers of the quarterly, The Nebraska Bird Review
   Spring Meeting, May 16 - 18, 2014, Fontenelle Forest, Bellevue, NE

8. Nebraska Psychological Society
   http://www.nebpsych.org/

9. Nebraska-Southeast South Dakota Section Mathematical Association of America
   Web site: http://math.creighton.edu/maa/
   Spring Meeting, March 14-15, 2014, Joint Mtg w/ Nebraska and South Dakota Nebraska Wesleyan University, Lincoln, NE

10. Nebraska Space Grant Consortium
    Web site: http://ne.spacegrant.org/

THE NASA NEBRASKA SPACE GRANT CONSORTIUM HELPED DEFRAY THE COST OF PRINTING THESE PROCEEDINGS.
THE NEBRASKA ACADEMY OF SCIENCES, INC.
302 Morrill Hall, 14th & U Streets
Lincoln, Nebraska 68588-0339

Affiliated with the American Association for the Advancement of Science
And
National Association of Academies of Science

GENERAL INFORMATION

Members and visitors will be registered at Olin Hall of Science, Nebraska Wesleyan University, 50th & St. Paul, Lincoln, Nebraska. The registration fee is $70.00 for General Registrants which includes dues. Student registration is $15.00, student dues are an additional $10.00 with a VALID student ID. Registrants are entitled to the PROGRAM/PROCEEDINGS and to attend any of the section meetings. Junior and senior high school students will register at a separate area, FREE.

Additional copies of the PROGRAM/PROCEEDINGS may be obtained at the Registration Desk or, after the meeting, at the Academy Office, for $4.00/copy.

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 42 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

Our website address is <www.neacadsci.org>.
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30</td>
<td>REGISTRATION FOR ACADEMY, Lobby of Lecture wing, Olin Hall</td>
</tr>
<tr>
<td>8:00</td>
<td>Aeronautics and Space Science, Session A, Olin 249</td>
</tr>
<tr>
<td>8:00</td>
<td>Aeronautics and Space Science, Session B, Olin 224</td>
</tr>
<tr>
<td>8:15</td>
<td>Collegiate Academy, Biology Session A, Olin B</td>
</tr>
<tr>
<td>8:15</td>
<td>Chemistry and Physics, Section A, Chemistry, Olin A</td>
</tr>
<tr>
<td>8:15</td>
<td>Chemistry and Physics, Section B, Physics, Planetarium</td>
</tr>
<tr>
<td>8:20</td>
<td>Collegiate Academy, Chemistry and Physics, Session A, Olin 324</td>
</tr>
<tr>
<td>8:25</td>
<td>Applied Science and Technology, Olin 325</td>
</tr>
<tr>
<td>8:30</td>
<td>Biological and Medical Sciences, Session A, Olin 112</td>
</tr>
<tr>
<td>8:30</td>
<td>Biological and Medical Sciences, Session B, Smith Callen Conference Center</td>
</tr>
<tr>
<td>8:30</td>
<td>Junior Academy, Judges Check-In, Olin 219</td>
</tr>
<tr>
<td>9:00</td>
<td>Junior Academy, Senior High REGISTRATION, Olin Hall Lobby</td>
</tr>
<tr>
<td>9:00</td>
<td>Junior Academy, Senior High Judging, preliminary, Olin 124, Olin 131</td>
</tr>
<tr>
<td>9:10</td>
<td>Aeronautics and Space Science, Poster Session, Olin 249</td>
</tr>
<tr>
<td>9:15</td>
<td>Anthropology, Olin 111</td>
</tr>
<tr>
<td>10:00</td>
<td>Biological and Space Science, Poster Session, Olin 249</td>
</tr>
<tr>
<td>11:00</td>
<td>MAIBEN MEMORIAL LECTURE, OLIN B</td>
</tr>
<tr>
<td>11:00</td>
<td>Terry Rasmussen, Chief Metallurgist, Nucor Steel, Norfolk, NE – Education, Careers and</td>
</tr>
<tr>
<td></td>
<td>Opportunities in Engineering and Metallurgy in Nebraska</td>
</tr>
<tr>
<td>12:00</td>
<td>LUNCH, PATIO ROOM, STORY STUDENT CENTER</td>
</tr>
<tr>
<td></td>
<td>(pay and carry tray through cafeteria line, or pay at NAS registration desk)</td>
</tr>
<tr>
<td></td>
<td>Aeronautics Group, Sunflower Room</td>
</tr>
<tr>
<td>1:00</td>
<td>Biological and Medical Sciences, Session C, Olin 112</td>
</tr>
<tr>
<td>1:00</td>
<td>Biological and Medical Sciences, Session D, Smith Callen Conference Center</td>
</tr>
<tr>
<td>1:00</td>
<td>Chemical and Physics, Session A, Chemistry, Olin A</td>
</tr>
<tr>
<td>1:00</td>
<td>Collegiate Academy, Biology Session A, Olin B</td>
</tr>
<tr>
<td>1:00</td>
<td>Collegiate Academy, Biology Session B, Olin 249</td>
</tr>
<tr>
<td>1:00</td>
<td>Collegiate Academy, Chemistry and Physics, Session B, Olin 324</td>
</tr>
<tr>
<td>1:00</td>
<td>Junior Academy, Judges Check-In, Olin 219</td>
</tr>
<tr>
<td>1:10</td>
<td>Junior Academy, Junior High REGISTRATION, Olin Hall Lobby</td>
</tr>
<tr>
<td>1:10</td>
<td>Junior Academy, Senior High Judging, (Final), Olin 110</td>
</tr>
<tr>
<td>1:15</td>
<td>Teaching of Science and Math, Olin 224</td>
</tr>
<tr>
<td>1:15</td>
<td>Anthropology, Olin 111</td>
</tr>
<tr>
<td>1:15</td>
<td>Earth Science, Olin 325</td>
</tr>
<tr>
<td>1:30</td>
<td>Junior Academy, Junior High Judging, Olin 124, Olin 131</td>
</tr>
<tr>
<td>2:00</td>
<td>NJAS Board/Teacher Meeting, Olin 219</td>
</tr>
<tr>
<td>4:45</td>
<td>BUSINESS MEETING, OLIN B</td>
</tr>
<tr>
<td>5:45</td>
<td>AWARDS RECEPTION for NJAS, Scholarships, Members, Spouses, and Guests</td>
</tr>
<tr>
<td></td>
<td>First United Methodist Church, 2723 N 50th Street, Lincoln, NE</td>
</tr>
</tbody>
</table>
AERONAUTICS AND SPACE SCIENCE
Chairperson: Scott E. Tarry
NASA Nebraska Space Grant & EPSCoR, University of Nebraska at Omaha

SESSION A
Olin 249

8:00 a.m. 1. VARIABILITY OF MASS OUTFLOWS IN ACTIVE GALACTIC NUCLEI. Ben Schmachtenberger* and Jack Gabel, Department of Physics, Creighton University, Omaha.

8:10 2. INVESTIGATING THE RELATIONSHIP BETWEEN OCULAR BLOOD FLOW AND FORCE APPLIED TO THE CORNEA: A HUMAN SUBJECT PILOT STUDY. Jeff Hawks*, Joan Yule, and Chase Pfeifer, Department of Mechanical & Materials Engineering, University of Nebraska – Lincoln, NE; and Max Twedt, Keith Ozanne, and Greg Bashford, Department of Biological Systems Engineering, University of Nebraska–Lincoln.

8:20 3. INTESTINAL BIOMECHANICS SIMULATOR FOR EXPEDITING DEVELOPMENT OF ROBOTIC CAPSULE ENDOSCOPIES. Piotr R. Slawinski* and Benjamin S. Terry, Department of Mechanical and Materials Engineering, University of Nebraska–Lincoln.

8:30 4. INVESTIGATION INTO SONOLUMINESCENCE. Nathan Brady* and Kenneth Tranham, Department of Physics, University of Nebraska at Kearney.

8:40 5. ON A DISCRETE LAGRANGIAN METHOD FOR LASER-PLASMA INTERACTIONS. J. Paxon Reyes* and B.A. Shadwick, Department of Physics and Astronomy, University of Nebraska–Lincoln.

8:50 6. A 2D SHAPE RECOGNITION PACKAGE FOR APPLICATIONS IN WEAPON DETECTION AND AIRLINE SAFETY. Benjamin Knutson* and Renat Sabirianov, Department of Physics, University of Nebraska at Omaha.

9:00 7. A STUDY OF LIGHT DARK MATTER. A. J. Hagen, Department of Physics, Creighton University, Omaha.

9:10 BREAK/POSTER PRESENTATIONS

9:30 8. MONITORING THE UV ABSORPTION OF MARKARIAN 279 USING THE HUBBLE SPACE TELESCOPE. Zachary Monti* and Jack Gabel, Department of Physics, Creighton University, Omaha.
9:40  9. MODELING THE EFFECTS OF MICROGRAVITY ON OXIDATION IN MITOCHONDRIA: A PROTEIN DAMAGE ASSESSMENT ACROSS A DIVERSE SET OF LIFE FORMS. Oliver Bonham-Carter, College of Information and Technology, University of Nebraska at Omaha.

9:50  10. SAMPLE ENTROPY OUTPERFORMS APPROXIMATE ENTROPY FOR LARGE GAIT DATA SETS. Josh Pickhinke*, Eric Pisciotta, and Jenna Yentes, School of Health, Physical Education and Recreation, University of Nebraska at Omaha.

10:00  11. THE ROLE OF VISUAL AND TACTILE STIMULATION IN LOCOMOTOR ADAPTATION. Diderik Jan Eikema* and Mukul Mukherjee, Department of Biomechanics, University of Nebraska at Omaha.

10:10  12. SYNCHRONIZATION OF THE CORTICAL OSCILLATIONS IN THE BETA FREQUENCY RANGE DURING MOVEMENT. David Arpin*, James Gehringer, and Max Kurz, Department of Physical Therapy, University of Nebraska Medical Center, Omaha.

10:20  13. MOTOR PLANNING AS A BIOMARKER FOR SENSORIMOTOR INTEGRATION DIFFICULTIES IN ASTRONAUTS AFTER SPACEFLIGHT. Brenda Davies*, James Gehringer, and Max Kurz, Department of Physical Therapy, University of Nebraska Medical Center, Omaha.

10:30  BREAK/POSTER PRESENTATIONS

10:50  14. A COMPARISON OF JOINT MOMENTS AND POWERS OVERGROUND VERSUS TREADMILL WALKING. Alek Diffendaffer* and Sara Myers, Department of Health, Physical Education and Recreation, University of Nebraska at Omaha.

11:00  15. NEUROMUSCULAR, METABOLIC, AND MUSCLE MORPHOLOGY CONTRIBUTIONS TO FATIGUE ON INDIVIDUALS WITH A HISTORY OF KNEE INJURIES. Elizabeth Bracciano*, Maureen Turner*, and Jorge Zuniga, Department of Exercise Science, Creighton University, Omaha.

11:10  16. THE EFFECT OF MUSCLE TEMPERATURE IN NEUROMUSCULAR FATIGUE THRESHOLDS. Matthew Bubak*, Austin Ketter, and Jorge Zuniga, Department of Exercise Science, Creighton University, Omaha.

11:20  17. NEW SUBMAXIMAL FATIGUE THRESHOLD TEST FOR MUSCULAR FUNCTION. Chelsee James*, Tai Hoang*, and Jorge Zuniga, Department of Exercise Science, Creighton University, Omaha.
AERONAUTICS AND SPACE SCIENCE
Chairperson: Michaela Lucas
NASA Nebraska Space Grant & EPSCoR, University of Nebraska at Omaha

SESSION B
Olin Hall Room 224

8:00 a.m. 1. QUANTIFYING SPATIAL VARIABILITY OF MICROBENTHIC ALGAE USING OPTICAL REFLECTANCE MEASUREMENTS. Gina Gilson*, Department of Biology; and John Schalles, Department of Environmental Science; and John O’Donnell, Department of Atmospheric Science, Creighton University, Omaha.

8:10 2. EFFECTS OF DROPLET DIAMETER ON THE LEIDENFROST TEMPERATURE OF LASER PROCESSED MULTISCALE STRUCTURED SURFACES. Anton Hassebrook* and Sidy Ndao, Department of Mechanical and Materials Engineering, University of Nebraska–Lincoln.

8:20 3. ENHANCED POOL-BOILING HEAT TRANSFER AND CRITICAL HEAT FLUX USING FEMTOSECOND LASER SURFACE PROCESSING. Corey Kruse* and Sidy Ndao, Department of Mechanical and Materials Engineering, University of Nebraska–Lincoln.

8:30 4. FEMTOSECOND LASER SURFACE PROCESSING TECHNIQUES AND APPLICATIONS IN ELECTROCHEMISTRY. Christopher Wilson*, Troy Anderson, Craig Zuhlke, and Dennis Alexander, Department of Electrical Engineering; and George Gogos, Sidy Ndao, and Corey Kruse, Department of Mechanical Engineering, University of Nebraska–Lincoln.

8:40 5. THE LEIDENFROST ENERGY BARRIER. Nathan Van Loon*, Corey Kruse, George Gogos, and Sidy Ndao, Department of Mechanical and Materials Engineering; and Christopher Wilson, Craig Zuhlke, Troy Anderson, and Dennis Alexander, Department of Electrical Engineering, University of Nebraska–Lincoln.

8:50 6. ROBOT DEVELOPMENT FOR ZERO-G TESTING. Tom Frederick, Department of Mechanical and Materials Engineering, University of Nebraska–Lincoln.

9:00 7. AN AUCTION-BASED POSITION SELECTION ALGORITHM FOR EFFICIENT RECONFIGURATION IN MODULAR ROBOTS. Ayan Dutta*, Prthviraj Dasgupta, and Jose Baca, Department of Computer Science, University of Nebraska at Omaha, NE; and Carl Nelson, Department of Mechanical Engineering, University of Nebraska–Lincoln.

9:10 BREAK/POSTER PRESENTATIONS
8. COORDINATING MODULAR SELF-RECONFIGURABLE ROBOTS BY MEANS OF TOPOLOGY DISCOVERY AND LEADER ELECTION: IMPROVEMENT OF THE LOCOMOTION CASE. Jose Baca*, Bradley Woosley, Raj Dasgupta, and Ayan Dutta, Department of Computer Science, University of Nebraska at Omaha; and Carl Nelson, Department of Mechanical and Materials Engineering, University of Nebraska–Lincoln.

9:40 9. DEXTERITY AND POSTURAL CONTROL DURING TELESURGICAL PRACTICE. Katie Moravec, Chun-Kai Huang, and Ka-Chun (Joseph) Siu*, Department of Physical Therapy Education; and Anton Simorov, Department of General Surgery, University of Nebraska Medical Center, Omaha.

9:50 10. DESIGN OF A SMALL AIRPLANE FOR DESIGN, BUILD, FLY COMPETITION. Taylor Kerl* and John Jasa, Department of Mechanical and Materials Engineering, University of Nebraska–Lincoln.

10:00 11. ELECTRO-HYDRODYNAMIC THIN FILM BOILING AND 3D PRINTED CIRCUITS IN ELEMENTS OF SPACE AND MICROGRAVITY. Mirzojamshed Mirzokarimov, Department of Electrical Engineering, University of Nebraska–Lincoln.

10:10 12. FULLY AUTONOMOUS UNMANNED AERIAL VEHICLE. Spencer Gowin* and William Spurgeon, Department of Business and Information Technology, Western Nebraska Community College, Scottsbluff.

10:20 13. AUTONOMOUS ROBOTICS. Quinn Fogle* and William Spurgeon, Department of Business and Information Technology, Western Nebraska Community College, Scottsbluff.

10:30 BREAK/POSTER PRESENTATIONS

10:50 14. STIMULATING STEM INTEREST IN THE ELEMENTARY SCHOOL: COLLEGE OF SAINT MARY ELEMENTARY SCIENCE OUTREACH PROGRAM. Jeff Keyte, Department of Biology, College of Saint Mary, Omaha.

11:00 15. ENGAGEMENT OF HIGH SCHOOL AND MIDDLE SCHOOL STUDENTS IN ROBOTICS: SOLVING SPACE CHALLENGES IN THE ZERO ROBOTICS COMPETITION. Claire O’Connell*, Jose Baca, and Raj Dasgupta, Department of Computer Science, University of Nebraska at Omaha.

11:20  17. MAPPING NATIVE SPECIES OF THE WINNEBAGO RESERVATION: MOUNTAIN LIONS AND THE ARROWHEAD PLANT. Sarah Alvarado, Kayleen Blackhawk, Christopher Clay, Craig Cleveland, Jr., Christian LaPointe, Karen Scott*, Roger Whitebear, Bobbie Wolfe, and Al Martyn, Department of Indigenous Science and Math; and Jessie Antonellis, Department of Math, Little Priest Tribal College, Winnebago.

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.
Olin Hall Room 249

THE USE OF POLYVINYL ALCOHOL TO INHIBIT THE HYDRATE TRANSFORMATION OF THE DRUG THEOPHYLLINE. Madison Mapes, Department of Chemistry, University of Nebraska at Omaha.

PROTEIN ASSOCIATION DOMAINS OF THE MANNOSE 6-PHOSPHATE/INSULIN-LIKE GROWTH FACTOR II RECEPTOR. Brittney Tweedy, Department of Chemistry, University of Nebraska at Omaha.

UNIVERSITY OF NEBRASKA – LINCOLN- INTERCOLLEGIATE ROCKET ENGINEERING COMPETITION. Brad Christensen, Department of Mechanical Engineering, University of Nebraska–Lincoln.

COLLEGE OF SAINT MARY ELEMENTARY SCIENCE OUTREACH PROGRAM: UNDERGRADUATE STUDENT MANAGEMENT AND DELIVERY OF AN ELEMENTARY SCIENCE OUTREACH PROGRAM. Haden Mikesell* and Ananya Mitra, Department of Biology, College of Saint Mary, Omaha.

EXPANDING MATH AND SCIENCE TEACHING SKILLS FOR PRESERVICE ELEMENTARY TEACHERS. Lynne E. Houtz, Department of Education, Creighton University, Omaha.

AN OVERVIEW OF CURRENT QUASAR RESEARCH. John Mangles, Department of Physics, Creighton University, Omaha.

HIGH ALTITUDE BALLOONING: SPECTRAL ANALYSIS. Josh Gebbie, Department of Space Science, Metropolitan Community College, Omaha.
ANTHROPOLOGY
Co-chairpersons: Matthew Douglass and John Wagoner
Department of Anthropology
University of Nebraska–Lincoln
Olin Hall 111

9:15 a.m.    WELCOME

9:35    1. THE INFLUENCE OF CURRENT EVENTS ON ARCHAEOLOGICAL HYPOTHESIS GENERATION. Justin King, Department of Anthropology, University of Nebraska–Lincoln.

9:55    2. SIGNALING HOMESTEAD SUCCESS: PRELIMINARY ASSESSMENT OF THE VALIDITY OF SOCIOECONOMIC INFERENCE FROM THE CUSTER COUNTY PHOTOGRAPHS OF SOLOMON BUTCHER. Lauren Walkling, Department of Anthropology, University of Nebraska–Lincoln.

10:15    3. TOWARDS THE DEVELOPMENT OF SOD HOUSE ARCHAEOLOGY: GEOPHYSICAL AND ORAL HISTORICAL APPROACHES IN CUSTER COUNTY, NEBRASKA. Erin Carr, Department of Anthropology, University of Nebraska–Lincoln.

10:35    4. PHOTOGRAMMATICAL DOCUMENTATION OF ROCK CAIRNS IN THE TONGASS NATIONAL FOREST SOUTHEASTERN ALASKA. Mike Chodoronek, Department of Anthropology, University of Nebraska–Lincoln.


11:15    6. ARCTIC ARCHAEOLOGY: LITHIC TOOLKIT TRENDS AND PATTERNS ACROSS TOOL TRADITIONS. Zachary Day, Department of Anthropology, University of Nebraska–Lincoln.

11:35    7. A LARGE ASSEMBLAGE OF MEDIEVAL COARSE WARES FROM THE SANCTUARY OF ZEUS AT NEMEA. Kristina Whitney, Department of Anthropology, University of Nebraska–Lincoln.

11:55    8. BRIDE THEFT AND WARFARE. Elizabeth Workentine, Department of Anthropology, University of Nebraska–Lincoln.

12:15    LUNCH

1:15    9. POST WORLD WAR II EXPULSION OF EASTERN GERMANS. Aaron Patee, Department of Anthropology, University of Nebraska–Lincoln.
1:30  10. FORGING COMMUNITY-BASED STRATEGIES FOR IMPROVING DIET AMONG NATIVE AMERICAN CHILDREN: A TRANSFORMATIVE MIXED METHODS STUDY. Rachel Sinley* and Wayne Babchuk, Department of Anthropology, University of Nebraska–Lincoln.

1:55  11. STRENGTHENING RESEARCH-BASED PRACTICE THROUGH COMMUNITY COLLABORATION: A QUALITATIVE STUDY OF MINORITY HEALTH CARE PROFESSIONALS. Wayne Babchuk* and Lesa Brand*, Department of Anthropology, University of Nebraska–Lincoln.

2:15  12. LEPTIN AND ALLERGIES: A PROPOSAL FOR UNDERSTANDING THE RELATIONSHIP THROUGH LIFE HISTORY THEORY. Gaby Lapera, Department of Anthropology, University of Nebraska–Lincoln.

2:35  13. DEVELOPMENTAL PLASTICITY IN THE TIBIA REFLECTS DIFFERING REGION OF BIRTH IN MALES OF EUROPEAN DESCENT. Daniel Osborne* and Emily Hammerl, Department of Anthropology, University of Nebraska–Lincoln.

APPLIED SCIENCE AND TECHNOLOGY
Chairperson: Mary Ettel
Wayne State College, Wayne
Olin Hall 325

8:25  OPENING REMARKS

8:30  1. GEOGRAPHIC VARIATION OF HEALTH CARE SPENDING ON HEART FAILURE. Kevin McMillan, Department of Geography, School of Natural Resources, University of Nebraska–Lincoln.

8:45  2. THE IMPACT OF PERTURBATIONS ON BIOCHEMICAL SIGNAL TRANSDUCTION NETWORKS. Laura Allen, Department of Mathematics, University of Nebraska at Omaha.

9:00  3. ALTERNATIVE USES OF VEGETABLE OILS AS SUNSCREENS AND SUNSCREEN MODIFIERS. Darius Agoumba and Samantha Marzorati*, Department of Physical Sciences and Mathematics, Wayne State College, Wayne.

9:15  4. MODERNIZATION OF SMALL SCALE ZONE REFINING. Jon Davis*, Mariah McAfoos*, and David Peitz, Department of Physical Sciences and Mathematics, Wayne State College, Wayne.
5. EXPLORING THE EFFECT OF VARIOUS METAL MORDANTS ON ANTHOCYANIN AND BETANIN DYE. Carrie Brown* and Mary Ettel, Department of Physical Sciences and Mathematics, Wayne State College, Wayne.

**BIOLOGICAL AND MEDICAL SCIENCES**
Chairperson: Annemarie Shibata
Department of Biology, Creighton University

**SESSION A**
Session Chairperson: Brad Ericson, University of Nebraska Kearney
Olin 112

8:30 1. IDENTIFICATION OF VARIABLE MICROSatellite LOCI FOR COYOTE POPULATIONS IN NEBRASKA. Jennifer Frisch*, Letitia Reichart, and Joseph T. Springer, Department of Biology, University of Nebraska at Kearney.

8:42 2. STOMACH CONTENT ANALYSIS OF RECENT SNOWY OWL (*Bubo scandiacus*) SPECIMENS FROM NEBRASKA. Rachel L Valenziano* and Thomas E Labedz, University of Nebraska State Museum, University of Nebraska–Lincoln.

8:54 3. ANALYSIS OF WING LOADING, ASPECT RATIO, AND WING SURFACE AREA IN RELATION TO MORPHOMETRIC DATA IN A COMMUNITY OF NEW MEXICAN BATS. Rachel Valenziano* and Patricia Freeman, University of Nebraska State Museum, University of Nebraska–Lincoln.

9:06 4. PRELIMINARY INVESTIGATION OF PLASMA LIPID METABOLITES FOR A SPRING MIGRATORY BIRD IN CENTRAL NEBRASKA. Loany Fajardo* and Letitia Reichart, Department of Biology, University of Nebraska at Kearney.

9:18 5. POLLEN DEVELOPMENT IN *Ruppia maritima*. Luke Aeilts* and Mackenzie Taylor, Department of Biology, Creighton University, Omaha.

9:30 BREAK

9:45 6. IDENTIFICATION OF SEPTIN REGULATORS IN *Candida albicans*. Carissa Brugman* and Jill R. Blankenship, Department of Biology, University of Nebraska at Omaha.

9:57 7. SEPTIN ASSOCIATING PROTEINS IN *Candida albicans*. Elizabeth H. Hutfless* and Jill R. Blankenship, Department of Biology, University of Nebraska at Omaha.
10:09 8. THE ROLE OF SEPTIN CDC3 IN CELL WALL INTEGRITY IN CANDIDA ALBICANS. Tanner M. Johnson* and Jill R. Blankenship, Department of Biology, University of Nebraska at Omaha.

10:21 9. CREATION OF AN RFP-TAGGED CONSTRUCT FOR COMPLEMENTATION OF CANDIDA ALBICANS. Mitchell Chlopek* and Jill Blankenship, Department of Biology, University of Nebraska at Omaha.

10:33 10. INTEGRATION OF DOMAIN KNOWLEDGE AND GENE EXPRESSION DATA IN THE DEVELOPMENT OF ENRICHED CORRELATION NETWORKS. Sean West * and Hesham Ali, School of Interdisciplinary Informatics, University of Nebraska at Omaha.

11:00 MAIBEN MEMORIAL LECTURE - OLIN HALL B

BIOLOGICAL AND MEDICAL SCIENCES
SESSION B
Session Chairperson: Kim Carlson, University of Nebraska Kearney
Smith Callen Conference Center

8:30 1. EXAMINATION OF THE STRUCTURE AND FUNCTION OF A MAMMALIAN RIBOSWITCH IN ORDER TO DESIGN ANTI-CANCER DRUGS. Katherine M. Bauer * and Juliane Soukup, Department of Chemistry, Creighton University, Omaha.

8:42 2. EVOLUTIONARY HISTORY OF rRNA INTRONS IN LECANORA SPP. Shanice Harris* and Dawn M. Simon, Department of Biology, University of Nebraska at Kearney; and Jolanta Miadlikowska, Ester Gaya and François Lutzoni, Department of Biology, Duke University, Durham, NC.

8:54 3. ANALYSIS OF A NOVEL DEVELOPMENT OF TENOFOVIR DISPONPROXIL FUMARATE NANOPARTICLES FOR HIV-1 PROPHYLAXIS. Patrick Bruck* and Annemarie Shibata, Department of Biology; and Abhijit Date and Chris Destache, School of Pharmacy and Health Professions, Creighton University, Omaha.

9:06 4. PROTEOMICS IN HIV STUDIES. Madelyn Warren*, Department of Biology, University of Nebraska at Kearney; and Michael Belshan, Department of Medical Microbiology and Immunology, Creighton University Medical Center, Omaha.

9:18 5. CHARACTERIZATION AND FUNCTIONAL ASSESSMENT OF GLUTAMINASE C OVEREXPRESSION IN MOUSE CENTRAL NERVOUS SYSTEM. Blaise Lanoha*, Yi Wang, Yuju Li, Yunlong Huang, and Jialin Zheng, Department of Pharmacology and Experimental Neurosciences, University of Nebraska Medical Center, Omaha.

9:30 BREAK
6. COMPUTATIONAL FRAMEWORK TO IDENTIFY POTENTIAL mRNAs LOCALIZED TO THE MITOCHONDRIA.  Kaitlin Goettsch*, Jasjit Banwait and Dhundy K. Bastola, School of Interdisciplinary Informatics, College of Information Science and Technology, University of Nebraska at Omaha.

7. MITOCHONDRIAL RESPIRATION STUDIES SUGGEST A NOVEL MECHANISM FOR AMINOGLYCOSIDE-INDUCED HEARING LOSS.  Christina Miller*, Danielle Desa, and Michael G. Nichols, Department of Physics; and Heather Jensen Smith, Department of Biomedical Studies, Creighton University, Omaha.

8. EVALUATING MITOCHONDRIAL SUPEROXIDE FORMATION IN COCHLEAR CELLS DURING OTOTOXIC ANTIBIOTIC EXPOSURE.  Danielle Desa*, Christina Miller, and Michael G. Nichols, Department of Physics, and Heather Jensen Smith, Department of Biomedical Studies, Creighton University, Omaha.

9. METABOLIC PROFILING OF COCHLEAR DYSFUNCTION VIA TWO-PHOTON FLUORESCENCE LIFETIME MICROSCOPY OF NADH.  Lyandysha Zholudeva*, Kristina Ward, Michael Nichols, and Heather Jensen Smith, Departments of Chemistry, Physics and Biomedical Sciences, Creighton University, Omaha.

10. BOVINE HERPESVIRUS 1 PRODUCTIVE INFECTION STIMULATES INFLAMMASOME FORMATION AND CASPASE 1 ACTIVITY.  Jeff Alexander*, School of Biological Sciences; and Clinton Jones, School of Veterinary Medicine and Biomedical Sciences, University of Nebraska–Lincoln; and Jianlin Wang, College of Animal Science and Veterinary Medicine, Qingdao Agricultural University, Qingdao, China.

11:00 MAIBEN MEMORIAL LECTURE - OLIN HALL B

BIOLOGICAL AND MEDICAL SCIENCE
SESSION C
Session Chairperson: Julie Shaffer, University of Nebraska Kearney
Olin 112

1:00 1. EXAMINATION OF THE PHYSIOLOGICAL ROLE FOR CLASS I AND CLASS II FRUCTOSE BISPHOSPHATE ALDOLASES IN PATHOGENIC SALMONELLA.  Jeff Shaw* and Travis J. Bourret, Department of Biology, University of Nebraska at Kearney.

1:12 2. BACTERIAL IDENTIFICATION AND CROWDSOURCING TECHNIQUE FOR ASSESSMENT.  Karl Krieser*, Sumanth Ghanta, and Dhundy R. Bastola, School of Interdisciplinary Informatics, College of Information Science and Technology, University of Nebraska at Omaha.
3. ANTIBIOTIC ACTIVITY OF *BACillus Licheniformis*. Brady Baker*, Department of Physical and Life Sciences, Chadron State College, Chadron.

4. TESTING FOR THE PRESENCE OF METHICILLIN RESISTANT *Staphylococcus aureus* IN THE PHYSICAL ACTIVITY CENTER AT CHADRON STATE COLLEGE. Stephanie Steele*, Marcus Potter, and Ann Buchmann, Department of Physical and Life Sciences, Chadron State College, Chadron.

5. THE DISTAL PROMOTER OF THE blaKPC GENE IS REQUIRED FOR CARBAPENEM RESISTANCE. Erin Triplet* and Nancy Hanson, Department of Biology, Creighton University and Department of Medical Microbiology and Immunology, Creighton University Medical Center, Omaha.

6. INTRON DEGENERATION IN THE LICHEN FUNGI *Teloschistes*. Derek Kleier* and Dawn M. Simon, Department of Biology, University of Nebraska Kearney; and Jolanta Miadlikowska, Ester Gaya, and François Lutzoni, Department of Biology, Duke University, Durham, NC.

7. ELUCIDATING THE EXPANSION OF THE TISSUE INHIBITORS OF METALLOPROTEINASE (TIMP) MULTIGENE FAMILY DURING EUKARYOTIC EVOLUTION. Emma R. Hoppe*, Mark V. Reedy, and Soochin Cho, Department of Biology, Creighton University, Omaha.

8. DISTINCT NEUROCHEMICAL REGIONS WITHIN THE FOREBRAIN OF ELEPHANT SHARK’S (*Callorhinchus milli*) SUGGEST EVOLUTIONARY CONSERVATION. Maggie Bartlett* and Laura Bruce, Department of Biomedical Sciences, Creighton University, Omaha.

9. A COMPARISON OF THE DENISOVAN AND HUMAN GENOMES FOR INTEGRATION OF BIOINFORMATICS CONCEPTS INTO LAB CURRICULUM. Benjamin Wicks* and Mark Pauley, School of Interdisciplinary Informatics, University of Nebraska at Omaha.

10. EXON SIZES IN THE HUMAN GENOME. Mary Ellen Mooter* and Mark Pauley, School of Interdisciplinary Informatics, University of Nebraska at Omaha.
1:00  1. IN RESPONSE TO DAMAGE ACTIVATED MICROGLIA ENHANCE NEURONAL DIFFERENTIATION AND SURVIVAL. Alex Johnson*, Nick Mathy, and Annemarie Shibata, Department of Biology, Creighton University, Omaha.

1:12  2. DICER KNOCKOUT MICE SUGGEST CRITICAL ROLE OF MICRORNA IN CEREBELLAR CELL PROLIFERATION, ORGANIZATION, AND MIGRATION. Erik Arneson*, Taylor Mighell, Megan Bosch, and Annemarie Shibata, Department of Biology; and Garrett Soukup, Department of Biomedical Sciences, Creighton University, Omaha.

1:24  3. CYTOKINES SECRETED BY ACTIVATED MICROGLIA ENHANCE NEUROGENESIS THROUGH REGULATION OF NEURONAL MICRORNA. Nick Mathy*, Alex Johnson, and Annemarie Shibata, Department of Biology, Creighton University, Omaha.

1:36  4. CONDITIONAL DICER KNOCKOUT MICE REVEAL ESSENTIAL ROLE FOR MICRORNAS IN DEVELOPMENT AND FUNCTION OF CEREBELLAR CORTEX. Taylor Mighell*, Megan Bosch, Erik Arneson, and Annemarie Shibata, Department of Biology, and Garrett Soukup, Department of Biomedical Sciences, Creighton University, Omaha.

1:48  5. BIOMOLECULAR MODELING OF SYNTHETIC Aβ PROTOFILAMENTS. Brendy Aoki*, Department of Chemistry; and Patricia Soto, Department of Physics, Creighton University, Omaha

2:00  BREAK

2:12  6. MOLECULAR MODELING OF THE INHIBITION DYNAMICS OF THE CELLULAR PRION PROTEIN. Charles Nguyen* and Patricia Soto, Department of Physics; and Ian Collin, Department of Biology, and Jason Bartz, Department of Microbiology and Immunology, Creighton University, Omaha.

2:24  7. LOCALIZATION OF ADAM PROTEINS EXPRESSED BY THE MMD GENE IN NEURONAL CELLS OF DROSOPHILA MELANOGASTER. Bina Ranjit*, Ana Castro, and Bruce Chase, Department of Biology, University of Nebraska at Omaha.

2:36  8. DROSOPHILA MELANOGASTER NORA VIRUS VIRUS-LIKE PARTICLES: IN VITRO ASSEMBLY. Kellie D Licking-Murray*, Ryan K. Sowle, Brad Ericson, Darby Carlson, and Kimberly A. Carlson, Department of Biology, University of Nebraska at Kearney.
9. RISK-ASSESSMENT FOR TICK-BORNE DISEASES IN BUFFALO COUNTY, NEBRASKA. Whitney Nelson* and Travis Bourret, Department of Biology, University of Nebraska at Kearney.

10. *PSEUDOMONAS SYRINGAE* TRIGGERED REDUCTION OF HOST HISTONE H3-K9 ACETYLATION IN *ARABIDOPSIS* IS TYPE III EFFECTOR DRIVEN AND MAY INVOLVE HISTONE DEACETYLASE HDA5. Gloria Larson*, Michael Visenio, Hayley Geisterfer, and Karin van Dijk, Department of Biology, Creighton University, Omaha; and James Alfano, Department of Plant Pathology, University of Nebraska–Lincoln.

**CHEMISTRY AND PHYSICS**

Chairperson:
Andy Zhong, Department of Chemistry, University of Nebraska at Omaha

**SECTION A, CHEMISTRY**

Olin LH-A

8:15 a.m. WELCOME

8:20 1. PREPARATION OF SUPPORTS FOR HIGH PERFORMANCE AFFINITY CHROMATOGRAPHY BY ON-COLUMN ENTRAPMENT OF SERUM ALBUMIN AND LECTINS. John Vargas*, Jeanethe A. Anguizola, and David S. Hage, Department of Chemistry, University of Nebraska–Lincoln.

8:35 2. DYNAMIC SURFACE CHEMISTRY OF ELASTOMERIC POLYMERS. John Bowen* and Stephen A. Morin, Department of Chemistry, University of Nebraska–Lincoln.

8:50 3. DEVELOPMENT OF PROTEIN G MICROCOLUMNS FOR USE IN CHROMATOGRAPHIC-BASED COMPETITIVE BINDING IMMUNOASSAYS FOR PROTEIN BIOMARKERS. Mitchell L. Milanuk*, Erika L. Pfaunmiller, Jeanethe A. Anguizola, NaTasha Carter, and David S. Hage, Department of Chemistry, University of Nebraska–Lincoln.

9:05 4. SYNTHESIS OF DODECAPENTENE THIOESTER PRECURSOR FOR POLYKETIDE BIOSYNTHESIS. Andrew S. Olson* and Patrick H. Dussault, Department of Chemistry, University of Nebraska–Lincoln.

9:20 5. SIMULTANEOUS DETERMINATION OF RATE CONSTANTS AND EQUILIBRIUM CONSTANTS FOR SOLUTION-PHASE DRUG-PROTEIN INTERACTIONS BY ULTRAFAST AFFINITY CHROMATOGRAPHY. Xiwei Zheng*, Zhao Li, Maria I. Podariu, and David S. Hage, Department of Chemistry, University of Nebraska–Lincoln.

9:35 BREAK
6. EFFECTS OF MUTATIONS IN NEURAMINIDASE ON DRUG BINDING AND RESISTANCE OF INFLUENZA VIRUS. Kaitlyn Bergmann* and Haizhen A. Zhong, Department of Chemistry, University of Nebraska at Omaha.

7. EFFECT OF VOLATILE BUFFERS ON SOLUTE-PROTEIN BINDING IN HIGH-PERFORMANCE AFFINITY CHROMATOGRAPHY. So-Hwang Kye*, Ryan Matsuda, and David S. Hage, Department of Chemistry, University of Nebraska–Lincoln.

8. STERICALLY DIRECTED IMIDAZOLE SIDE CHAIN PROTECTION STRATEGIES FOR PREPARATION OF A 4(5)-BENZYL-L-HISTIDINYL TRIPEPTIDE USING FMOC-BASED SOLID-PHASE PEPTIDE SYNTHESIS. Hideaki Mekada and Martin Hulce*, Department of Chemistry; and D. David Smith, Department of Biomedical Sciences, Creighton University, Omaha.

9. TAKING THE BELL-EVANS-POLANYI SHORTCUT. PREDICTING REGIOSELECTIVITY OF NUCLEOPHILIC AROMATIC PHOTOSUBSTITUTION FROM ACTIVATION ENERGIES. Gene G. Wubbels, Department of Chemistry, University of Nebraska at Kearney.

10. DEVELOPMENT OF AN ENVIRONMENTAL BIOASSAY FOR DETECTION OF EMERGING CONTAMINANTS THROUGH HIGH-PERFORMANCE AFFINITY CHROMATOGRAPHY. Ryan Matsuda*, So-Hwang Kye, Christopher White II, Elliott Rodriguez, Donald Jobe, and David S. Hage, Department of Chemistry; and Daniel Snow, Water Sciences Laboratory/Nebraska Water Center, a part of the Daugherty Water for Food Institute, and School of Natural Resources, University of Nebraska–Lincoln.

11. KINETIC STUDIES OF MULTI-SITE INTERACTIONS BETWEEN DRUGS AND ALPHA1-ACID GLYCOPROTEIN BY USING PEAK PROFILING AND HIGH-PERFORMANCE AFFINITY CHROMATOGRAPHY. Cong Bi*, Rong Li, and David S. Hage, Department of Chemistry, University of Nebraska–Lincoln.

12. SUB-CLONING, EXPRESSION, AND PURIFICATION OF 4-HYDROXYPHENYLACETATE -1-HYDROXYLASE FROM DELFTIA ACIDOVORANS. Joe Pachunka*, Norah Hilger, Crisitian Valquier, and John Conrad, Department of Chemistry, University of Nebraska at Omaha.
13. TANDEM PREPARATION OF 4-FORMYL AND 4-IMINE 1,2,3-TRIAZoles. Joseph Christensen* and James T. Fletcher, Department of Chemistry, Creighton University, Omaha.

14. A DESILYLATION BASED APPROACH FOR SELECTIVE DETECTION OF FLUORIDE. Angela M. Bamesberger* and Haishi Cao, Department of Chemistry, University of Nebraska at Kearney.

15. DEVELOPMENT OF HIGH CAPACITY HSA MICROCOLUMNs FOR DRUG-PROTEIN INTERACTION STUDIES BASED ON HIGH-PERFORMANCE AFFINITY CHROMATOGRAPHY. Maria Podariu*, Xiwei Zheng, Sandya Beeram, and David S. Hage, Department of Chemistry, University of Nebraska–Lincoln.

16. BINDING INTERACTIONS BETWEEN DOPAMINE AND WATER SOLUBLE HOSTS CYCLODEXTRINS, CUCURBITURILs, AND BILE SALT MICELLES. Brock A. Madsen*, Emily J. Brestin, and Mahesh Pattabiraman, Department of Chemistry, University of Nebraska at Kearney.

17. INHIBITING PHARMACEUTICAL TRANSFORMATIONS USING POLYMER EXCIPIENTS. Alan D. Gift, Department of Chemistry, University of Nebraska at Omaha.

18. Γ-CYCLODEXTRIN MEDIATED HETERO-PHOTODIMERIZATION OF ALKENES IN THE SOLID-STATE. Aspen Rae Clements and Mahesh Pattabiraman*, Department of Chemistry, University of Nebraska at Kearney.

19. EFFECTS OF POROGENIC SOLVENTS IN MONOLITHIC COLUMNS AS EVALUATED BY HIGH-PERFORMANCE AFFINITY CHROMATOGRAPHY. Zhao Li*, Shannon Lum, Robert Hougas, Theresa Greving, Steven M. Gross, Erika Pfaunmiller, and David S. Hage, Department of Chemistry, University of Nebraska–Lincoln.

20. BINDING STUDIES OF FDA APPROVED DRUGS TO CYP3A4 PROTEINS. Gnandi Tanghanwaye*, Michelle Follis, and Haizhen A. Zhong, Department of Chemistry, University of Nebraska at Omaha.

21. MICROFLUIDIC REACTORS WITH RAPIDLY RECONFIGURABLE MICROCHANNEL NETWORKS AND DIMENSIONS, AND SUPPORT SUBTRATES. Abhiteja Konda* and Stephen A. Morin, Department of Chemistry, University of Nebraska–Lincoln.

22. PROTEIN ASSOCIATION DOMAINS OF THE MANNOSE 6-PHOSPHATE/INSULIN-LIKE GROWTH FACTOR II RECEPTOR. Brittney Tweedy*, John Riley III, and Jodi Kreiling, Department of Chemistry, University of Nebraska at Omaha.
4:15  CLOSING COMMENTS

CHEMISTRY AND PHYSICS
   Chairperson: Adam N. Davis
   Wayne State College, Wayne

SECTION B, PHYSICS
   Planetarium

8:15  WELCOME

8:20  1. SIMULATIONS OF $\eta_c$ PRODUCTION IN ULTRAPERIPHERAL Pb-Pb COLLISIONS AT 14 TeV IN ALICE. Barak R. Gruberg, Department of Physics, Creighton University, Omaha.

8:40  2. OPTIMIZATION OF LONG-RANGE ORDER IN SOLVENT-ANNEALED POLYSTYRENE-BLOCK-POLYLACTIDE BLOCK POLYMER THIN FILMS FOR NANOLITHOGRAPHY. Andrew Baruth, Department of Physics, Creighton University, Omaha.

9:00  3. SYNTHESIS OF GRAPHENE NANORIBBONS BY COVALENT ASSEMBLY OF MONOMERS. S. Beniwal*, D. A. Kunkel, and A. Enders, Department of Physics and Astronomy; and M. Shekhirev, T. H. Vo and A. Sinitski, Department of Chemistry, University of Nebraska–Lincoln.

9:15  4. NEUTRON VOLTAICS FOR DEEP SPACE MISSIONS. P.A. Dowben and A. Enders*, Department of Physics and Astronomy; and N. Ianno, Department of Electrical Engineering, University of Nebraska–Lincoln and Wai-Ning Mei, Department of Physics, University of Nebraska at Omaha.

9:30  5. JET QUENCHING AND JET IDENTIFICATION OF BOTTOM JETS IN COLLISIONS AT ALICE. Gleb Batalkin, Department of Physics, Creighton University, Omaha.

EARTH SCIENCE
   Chairperson: Michael Leite
   Chadron State College
   Olin 325

1:15 p.m.  WELCOME

1:20  1. POSTMORTEM BEHAVIOR OF VERTEBRATE CARCASSES IN AQUATIC ENVIRONMENTS: THE PHYSICS OF BLOATING, FLOATING AND EXPLODING. Margaret Darnell* and Michael B. Leite, Department of Geoscience, Chadron State College, Chadron.
1.40  2. PALEONTOLOGICAL INVENTORY OF A NEW LAND PARCEL IN THE Ogalala National Grasslands, Nebraska National Forest. David E. Draper, Department of Geoscience, Chadron State College, Chadron.

2:00  3. A STUDY OF JANUARY SULFUR DIOXIDE AIR POLLUTION IN EASTERN CHINA WITH THE COMPARISON OF GEOS-CHEM AND SUOMI-NPP OMPS. Chase Calkins and Jun Wang, Department of Earth and Atmospheric Science, University of Nebraska–Lincoln.

2:20  4. DOWNWARD TRANSPORT OF IRON IN UTAH’S GRAND STAIRCASE: THE ROLE OF CARBON DIOXIDE. David Loope and Richard Kettler, Department of Earth and Atmospheric Science, University of Nebraska–Lincoln.

---

TEACHING OF SCIENCE AND MATH
Chairperson: Josef Kren
Bryan College of Health Sciences, Lincoln
Olin 224

1:10 p.m.  WELCOME

1:15  1. USING SOCIAL MEDIA PLATFORMS TO ENHANCE STUDENT LEARNING IN THE SCIENCES. Margaret Darnell*, Sarah Blackstone, Ben Brechtel, and David Keim, Department Physical and Life Sciences, Chadron State College, Chadron.

1:30  2. EVALUATING A GRADUATE-LEVEL TEACHER EDUCATION PROGRAM. Elizabeth Lewis*, Aaron Musson, Jia Lu, Ana Rivero, and Robbie McCarty; Department of Teaching, Learning and Teacher Education, University of Nebraska–Lincoln.

1:45  3. LEARNING ABOUT INSTRUMENTATION BY BUILDING A UV/VIS SPECTROPHOTOMETER: AN INSTRUMENTAL ANALYSIS PROJECT AT DOANE COLLEGE. Erin Wilson* and Mark V. Wilson, Department of Chemistry, Doane College, Crete.

2:00  4. CAN LIQUID CARBON DIOXIDE BE USED AS A SOLVENT FOR UNDERGRADUATE ORGANIC CHEMISTRY LABORATORY PROCEDURES? Logan Fischer*, Zach Reisen, David Peitz, Department of Physical Science and Mathematics, Wayne State College, Wayne.

2:15  5. TEACHING CONSERVATION BIOLOGY THROUGH SERVICE LEARNING. Phyllis Higley, Department of Biology, College of Saint Mary, Omaha.

2:30  BREAK
6. THE IMPACT OF AN AFTER-SCHOOL INTERVENTION ON STEM IMPROVEMENT IN MIDDLE SCHOOL STUDENTS. Tyler A. Herek*, Lauren M. Dahlquist, and Christine E. Cutucache, Department of Biology, University of Nebraska at Omaha, Omaha.

7. COMPUTER SIMULATION OF PROGRESSIVE LIVER FAILURE AND ITS EFFECT ON DRUG METABOLISM. Jake McCain* and John Liesveld, Bryan College of Health Sciences, Lincoln.

8. ASSESSING THE RISK FACTORS FOR THROMBUS FORMATION IN WOMEN USING HORMONAL CONTRACEPTIVES THROUGH COMPUTER MODELING. Sarah Karthauser*, Samantha McPherson and Maggie Novak, Bryan College of Health Sciences, Lincoln.

9. COMPUTER SIMULATION OF HIV IMPACT ON CD4+ CELLS. Tim Pieper* and Logan Raymond, Bryan College of Health Sciences, Lincoln.

10. COMPUTER MODELS AS A TOOL FOR EDUCATING HEALTH CARE PROFESSIONALS ON RISKS OF CEREBROVASCULAR EVENTS. Jordan Vande Brug*, Camrie Seier and Josef Kren, Bryan College of Health Sciences, Lincoln.

COLLEGIATE ACADEMY
BIOLOGY
Chairperson: Terry McGinn, Biology Department
Nebraska Wesleyan University, Lincoln

SESSION A
Olin LH-B

8:00 a.m. 1. COMPARISON OF DISEASE BETWEEN NEWBORN-SCREENED AND CLINICALLY DIAGNOSED CYSTIC FIBROSIS PATIENTS. Shelby Travis*, Department of Biology, Nebraska Wesleyan University, Lincoln; and John Colombo, Dee Acquazzino, Timothy Hallberg, and Heather Thomas, and Pediatric Pulmonary Center, University of Nebraska Medical Center, Omaha.

8:12 2. DNA SEQUENCING OF THE a064r GENE OF PBCV-1 ANTIGENIC VARIANTS P9L11, P9L12, AND EPA-1. Emmalee Fishburn* and Garry Duncan, Department of Biology, Nebraska Wesleyan University, Lincoln.

8:24 3. DNA SEQUENCE ANALYSIS OF VIRAL PBCV-1 ANTIGENIC MUTANTS. Elizabeth Ippolito, Department of Biology, Nebraska Wesleyan University, Lincoln.
4. THE ROLE OF GADS IN T-CELL RECEPTOR MEDIATED SIGNALING. Brittney Dinkel*, Department of Chemistry, Nebraska Wesleyan University, Lincoln; and Mahmood Bilal and Jon C.D. Houtman, Department of Microbiology, University of Iowa.

5. THE SEARCH FOR METHANOPHENAZINE BIOSYNTHESIS GENES IN METHANOSARCINA ACETIVORANS. Nikolas Duszenko* and Nicole Buan, Redox Biology Center, University of Nebraska–Lincoln.

6. GROWTH OF PANICUM VIRGATUM IN A NACL GRADIENT. Seton Bachle, Department of Biology, Hastings College, Hastings.

7. CHANGES IN BONE MARROW AS A RESULT OF PRENATAL EXPOSURE TO CHLORPYRIFOS AND ATRAZINE. Molly Mullervy, Department of Biology, Hastings College, Hastings.

9:24 BREAK

8. DNA SEQUENCE ANALYSIS OF PARAMECIUM BURSARIA CHLORELLA VIRUS: ANTIGENIC MUTANTS FOR THE GENE AO64R. Megan Throener* and Garry Duncan, Department of Biology, Nebraska Wesleyan University, Lincoln.

9. CHANGES IN LEVELS OF ESTRADIOL AS A RESULT OF PRENATAL EXPOSURE TO ATRAZINE AND CHLORPYRIFOS IN SPRAUGE DAWLEY LABORATORY RATS. Alyssa Beman, Department of Biology, Hastings College, Hastings.

10:00 DEVELOPMENT OF A SIMPLE AND HIGH-THROUGHPUT SCREENING METHOD FOR AN ANTI-OBESITY COMPOUND FROM THE GUT METABOLOME: THE IMPORTANCE OF MITOCHONDRIAL DOCKING OF ACETYL-CoA CARBOXYLASE (ACC)-2. Taylor Friemel*, Rio Jati Kusuma, Janos Zempleni, Department of Nutrition Sciences, University of Nebraska–Lincoln.

11. TERT SUPRESSION VIA SMALL INTERFERANCE RNA IN CERVICAL CANCER CELLS. Shawn Gray*, Douglas Christensen, and Shawn Pearcy, Department of Life Sciences, Wayne State College, Wayne.

12. TRANSLOCATION OF BETA-METHYLAMINO-L-ALANINE INTO TOMATO (LYCOPERSICON ESCULENTUM) FRUIT. Lane Blobaum*, and Jerald S. Bricker, Department of Biology, Nebraska Wesleyan University, Lincoln.

13. INVESTIGATION OF CADHERIN GENE EXPRESSION AND TUMORSPHERE FORMATION CAPABILITIES OF PROSTATE CANCER CELL LINES. Kelsey Stark* and Kate Marley, Department of Biology, Doane College, Crete.
11:00 MAIBEN MEMORIAL LECTURE, OLIN LH-B

12:00 LUNCH

1:00 14. A GENETIC COMPONENT CONTRIBUTES TO EARLY INDUCTION OF ADIPOGENESIS AND LIPID PRODUCTION IN LM/BC AND SWV MEF CELLS TREATED WITH FUMONISIN B1. Kelsey A. Haswell*, Department of Biology, Nebraska Wesleyan University, Lincoln; and Gelineau-vanWaes, J., Maddox, J.R., Gardner, N., and A.J. Sachs, and Department of Pharmacology, Creighton University School of Medicine, Omaha.

1:12 15. ISOLATION AND IDENTIFICATION OF ENDOPHYTIC FUNGI FROM ECUADORIAN PLANT SAMPLES. Chris Johnson, Department of Biology, Nebraska Wesleyan University, Lincoln.

1:24 16. AMYLOID PRECURSOR-LIKE PROTEIN 2 PROMOTES GROWTH AND MIGRATION OF PANCREATIC CANCER CELLS, AND REDUCES THEIR EXPRESSION OF IMMUNE RECEPTORS. Nicole McKenna*, Department of Physical Sciences and Math, Wayne State College, Wayne; and Poomy Pandey, and Joyce C. Solheim, Eppley Institute for Research in Cancer and Allied Diseases, University of Nebraska Medical Center, Omaha.

1:36 17. AN ANALYSIS OF KSHV VIRAL DNA AND ANTIBODY RESPONSE IN RECENTLY INFECTED ZAMBIAN CHILDREN. Lisa Poppe*, Department of Biology, Doane College, Crete; and Landon Olp, Veenu Minhas, Danielle Shea, and Charles Wood, University of Nebraska–Lincoln Center for Virology, Lincoln.

1:48 18. MUTAGENESIS AND ISOLATION OF THE MAJOR OUTER MEMBRANE PROTEIN FROM CHLAMYDIA TRACHOMATIS FOR FUTURE VACCINE DEVELOPMENT. Carrie Brown* and Gustavo Zardeneta, Department of Chemistry; and Douglas Christensen and Nicole McKenna, Department of Biology, Wayne State College, Wayne.

2:00 19. THE ROLE OF CXCR2 ANTAGONISM IN THE TREATMENT OF PANCREATIC CANCER. Caitlin Molczyk*, Department of Life Sciences, Wayne State College, Wayne; and Rakesh Singh and Michelle Varney, Department of Pathology and Microbiology, University of Nebraska Medical Center at Omaha.

2:12 20. STUDYING THE IMPACT OF EPIGALLOCATECHIN-3-GALLATE, A COMPONENT OF GREEN TEA, ON BREAST CANCER STEM CELLS. Zachary J. Wordekemper* and Kate Marley, Department of Biology, Doane College, Crete.

2:24 BREAK

2:36 21. PREDATOR EXPOSURE AND HABITAT ACCLIMATION EFFECTS ON INTRODUCING GUPPIES (POECILIA RETICULATA) INTO NEW HABITAT WITH PREDATOR OSCARS
PRESENT (*ASTRONOTUS OCELLATUS*). Brian Ackman, Department of Biology, Nebraska Wesleyan University, Lincoln.

2:48 22. TRANSPOSON UPREGULATION IN RESPONSE TO STRESS IN THE SOYBEAN APHID. Daniel Cloonan*, Laramy Enders, and Nick Miller, Department of Entomology, University of Nebraska–Lincoln.

3:00 23. AQUATIC MACROINVERTEBRATE COMMUNITY VARIATION IN WETLANDS OF THE NEBRASKA SANDHILLS. Kaylee Faltys* and Barbara Hayford, Department of Life Sciences, Wayne State College, Wayne.

3:12 24. A PUTITIVE IDENTIFICATION OF FUNGAL ENDOPHYTES FROM CO-LOCATED TERRESTRIAL AND EPIPHYTIC ECUADORIAN Bromeliads. Andrew Reuss* and Jerald S. Bricker, Department of Biology, Nebraska Wesleyan University, Lincoln.

3:24 25. USING SCIENCE TO UNDERSTAND ZOO ELEPHANT WELFARE: NUTRITIONAL STATUS AND OBESITY ASSESSMENT. Brianna N. Wieseler*, Department of Biology, Nebraska Wesleyan University, Lincoln; and Kari Morfeld, Nebraska Wesleyan University, Lincoln.

3:36 26. SPECIES IDENTIFICATION AND DNA SEQUENCING OF ECUADORIAN ENDOPHYTES. Seth Gress* and Jerald S. Bricker, Department of Biology, Nebraska Wesleyan University, Lincoln.

**COLLEGIATE ACADEMY**

**BIOLOGY**

Chairperson: Terry McGinn, Department of Biology
Nebraska Wesleyan University, Lincoln

**SESSION B**

Olin 249

1:00 1. ADDRESSING WELLNESS AT AN OUTPATIENT MENTAL HEALTH CLINIC. Shyamaly Premaraj*, Monika Kolodziej, Mary Innis, Barbara Grimes-Smith, and Doug Ziedonis, Department of Biology, Nebraska Wesleyan University, Lincoln, and Department of Psychiatry, University of Massachusetts Medical School, Worcester, MA.

1:12 2. LIMB MECHANICS AND LOCOMOTOR PERFORMANCE DURING DIFFERENT MODES OF LOCOMOTION IN LONG-LIMBED AND SHORT-LIMBED LIZARDS. Kellsie Sedlak, Department of Biology, Nebraska Wesleyan University, Lincoln.
3. PHARMACOLOGICAL INHIBITION OF FATTY ALDEHYDE ADDUCTS AS A POTENTIAL THERAPY FOR SJÖGREN-LARSSON SYNDROME. Nargisa Ergasheva*, William Rizzo, and Zachary Bailey, Department of Biology, College of Saint Mary, Omaha; and Monroe Meyer Institute University of Nebraska Medical Center, Omaha.

4. CXCR2 KNOCKDOWN BOOSTS SENSITIVITY TO CHEMOTHERAPY TREATMENT IN MELANOMA. Megan T. Gunderson*, Michelle L. Varney and Rakesh K. Singh, Department of Biology, College of Saint Mary, Omaha, Department of Pathology & Microbiology, University of Nebraska Medical Center, Omaha.

5. DEVELOPMENT OF A CELL LINE WITH INDUCIBLE EXPRESSION OF ACTIVE AKT. Ischel Gonzalez Kelso*, Dulce Maroni, Mayumi Naramura, Department of Biology, College of Saint Mary, Omaha; and Eppley Institute for Research in Cancer and other Allied Diseases, University of Nebraska Medical Center, Omaha.

6. NON-MUSCLE MYOSIN II: AN ASTROGENIC DIFFERENTIATION INHIBITOR. Christina Harrison*, Woo-Yang Kim, Matt Latner, Minhan Ka, and Eui-Man Jung, Department of Biology, College of Saint Mary, Omaha; and Department of Neuroscience, University of Nebraska Medical Center, Omaha.

7. DESIGN AND OPTIMIZATION OF RNA ENCAPSULATED LIPOSOMES FOR DRUG DELIVERY. David Francis* and Srivatsan Kidambi, Department of Chemical and Biomolecular Engineering, University of Nebraska–Lincoln.

8. EXPLORATION OF THE COMMONALITIES BETWEEN BACTERIAL QUORUM SENSING FOR BIOFILM FORMATION AND COMMUNICATION BETWEEN HUMAN TUMOR CELLS. Taylor Ziegler* and Kate Marley, Department of Biology, Doane College, Crete.

9. IDENTIFYING THE GENETIC BASIS FOR A RARE ALBINO MUTANT IN AN ANDEAN SOLANACEAE SPECIES (*IOCHROMA CALYCINUM*). Rachel A. Coburn*, Department of Biochemistry, University of Nebraska–Lincoln; and Randi H. Griffin, Department of Evolutionary Anthropology, Duke University, Durham, NC; and Stacey D. Smith, Department of Ecology and Evolutionary Biology, University of Colorado-Boulder, CO.

10. INVESTIGATING EVOLUTIONARY TRADE-OFFS IN NEONATE NORTHERN WATER SNAKES, NERODIA SIPEDON, LOCOMOTION. Karis Overton* and Gary Gerald, Department of Biology, Nebraska Wesleyan University, Lincoln.

11. THE ROLE OF MIR-345 IN PANCREATIC CANCER. Keithstone Kim*, Department of Biology, Nebraska Wesleyan University, Lincoln; and Satyanarayana Rachagani, Lui Qing Xi,
IDENTIFICATION OF ENDOPHYTES COLLECTED FROM COLORADO BLUE SPRUCE LEAF TISSUE FROM GABLES, MICHIGAN. Aaron Schilling, Department of Biology, Nebraska Wesleyan University, Lincoln.

COLLEGIATE ACADEMY
CHEMISTRY AND PHYSICS
Chairpersons: David Treichel and Nathaniel Fackler
Nebraska Wesleyan University, Lincoln

SESSION A
Session Chairperson, David Treichel
Olin 324

8:20 a.m. 1. EXPLORING THE RUBIDIUM ATOM USING THE TEACHSPIN DIODE LASER SPECTROSCOPY SYSTEM. Carey D. Haefele*, and D. R. Sieglaff, Department of Physics and Astronomy, Nebraska Wesleyan University, Lincoln.

8:32 2. ELECTRON-POSITRON PRODUCTION IN ULTRA-PERIPHERAL COLLISIONS AT STAR. Ryan Gnabasik* and Janet Seger, Department of Physics, Creighton University, Omaha.

8:44 3. THE INCREASE Efficiency OF A CALIBRATED FUEL INJECTED ENGINE VERSUS THE EFFICIENCY OF A CARBURETED EQUIVALENT. Conner Thomas, Department of Physics, Hastings College, Hastings.

8:56 4. SYNTHESIS OF COPPER MONOSULFIDE THIN FILMS BY EX-SITU SULFIDATION. Erin Cheese*, Brianna Baca, Anton Yanchilin, and Andrew Baruth, Department of Physics, Creighton University, Omaha.

9:06 5. THERMODYNAMICS OF THE HEART: CALCULATING CARDIAC OUTPUT DURING EXERCISE. Ellie Meisinger, Department of Physics, Hastings College, Hastings.

9:18 BREAK

9:24 6. SOFTWARE DEVELOPMENT FOR THE NEW ALICE EMCAL READOUT SYSTEM. Jordan Roth* and Jiro Fujita, Department of Physics, Creighton University, Omaha.

9:34 7. ANALYZING THE ACOUSTICS OF A THEATRE AUDITORIUM. Laura C. Brill, Department of Physics, Nebraska Wesleyan University, Lincoln.
8. DESIGN, CONSTRUCTION, AND TESTING A PURPOSE-BUILT CLIMATE-CONTROLLED SOLVENT VAPOR ANNEALING CHAMBER FOR GUIDED SELF-ASSEMBLY OF BLOCK POLYMER THIN FILMS. Ryan Gnbasik* and Andrew Baruth, Department of Physics, Creighton University, Omaha.

9. EMPIRICALLY ANALYZING WASHBOARD ROADS. Jarrett Wise, Department of Physics, Hastings College, Hastings.

10. AMQP MESSAGE QUEUE PERFORMANCE AT STAR WITH APACHE QPID. Charles Costello*, Department of Physics, Creighton University, Omaha; and Jerome Lauret and Dmitry Arkhipkin, STAR Computing, Brookhaven National Laboratory, Upton, NY.

11. DEVELOPMENT OF A FINITE STATE MACHINE FOR THE STAR EXPERIMENT. Jacob Shearer, Department of Physics, Creighton University, Omaha.

1:00 p.m. 12. INVESTIGATION OF ATRAZINE METABOLITES IN RED-WINGED BLACKBIRD EGGS USING QUECHERS EXTRACTION GC-MS. Alyssa Blair* and Annette Moser, Department of Chemistry, University of Nebraska at Kearney.

1:12 13. DEVELOPMENT OF ARTIFICIAL AGONISTS AS CANDIDATE ANTIBIOTICS FOR A BACTERIAL RIBOSWITCH. Alexander Stock*, Julianna Diddle, Thomas Holmes, Dan Delaney, Erin Johnson, Rachel Fickes, Molly McDevitt, Danielle Renner, and Juliane K. Soukup*, Department of Chemistry, Creighton University, Omaha; and Xiang Fei and David Berkowitz, Department of Chemistry, University of Nebraska–Lincoln.

1:24 14. EXAMINING THE INTERACTIONS OF WATER WITH GLYCINE AND MIXED GLYCINE-SODIUM SULFATE AEROSOLS USING INFRARED SPECTROSCOPY. Amissabah Johnson* and Joshua P. Darr, Department of Chemistry, University of Nebraska at Omaha.
15. CONVERSION OF CELLOBIOSE INTO GLUCOSE BY MEANS OF METAL OXIDE SUPPORTED POLYOXOMETALATE CATALYSTS. John Burke*, Kate Sonnenfeld*, Zane Gernhart, and Chin Li Cheung, Department of Chemistry, University of Nebraska–Lincoln.

16. PREPARATION OF Na,N₃-BIS(T-BUTOXYCARBONYL)-4(5)-BENZYL-L-HISTIDINE METHYL ESTER. Benjamin Mitchell* and Martin Hulce, Department of Chemistry; and David Smith, Department of Biomedical Sciences, Creighton University, Omaha.

17. EARLY ATTACHMENT OF GRAM-POSITIVE BACTERIA TO ABIOTIC SURFACES VIA LIPOTHEICHOIC ACID INVESTIGATED BY SOLID-STATE NUCLEAR MAGNETIC RESONANCE. Megan Uehling*, Mark Wilson, and Erin Wilson, Department of Chemistry, Doane College, Crete.

18. WORK TOWARD DEVELOPMENT OF PAPER-BASED COLORIMETRIC ASSAYS FOR IRON (III) USING FUNCTIONALIZED GOLD NANOPARTICLES. Connor J. Neuville*, Kalani A. Parker, and Erin M. Gross, Department of Chemistry, Creighton University, Omaha.

19. USING GAS CHROMATOGRAPHY PAIRED WITH MASS SPECTROMETRY TO DETECT ATRAZINE IN TARGET SOIL SAMPLES. Anthony Donovan*, Annette C. Moser, Department of Chemistry, University of Nebraska at Kearney.

20. EXAMINING THE INTERACTIONS OF WATER WITH LYSINE AREOSOLS USING INFRARED SPECTROSCOPY. Paul Morales* and Joshua P. Darr, Department of Chemistry, University of Nebraska at Omaha.

21. STUDIES TOWARDS THE SYNTHESIS OF FMOC-N-METHYL-β-(TERT-BUTYLDIMETHYLSILYLOXY)-L-VALINE USING THE SCHÖLLKOPF CHIRAL AUXILIARY. Connor Griggs* and Martin Hulce, Department of Chemistry; and D. David Smith, Department of Biomedical Sciences, Creighton University, Omaha.

22. COMPUTATIONAL INVESTIGATION OF PORPHYRIN-QUINONES TO STUDY PHOTOINDUCED ELECTRON TRANSFER. Geoffrey Nelson* and Paul Karr, Department of Physical Science and Mathematics, Wayne State College, Wayne.

23. ON THE GAS PHASE DEUTERATION OF METHANE. Anne Mirich* and Bruce Mattson, Department of Chemistry, Creighton University, Omaha.
JUNIOR ACADEMY OF SCIENCES
Chairperson: Aurietha Hoesing, NJAS President, Omaha

8:30 – 9:00 a.m. Senior High Registration & Set Up Displays Olin Hall Lobby

9:00 – 12:00 Senior High Judging (preliminary) Olin 124, Olin 131
No Visitors

11:00 – 12:00 Maiben Lecture Olin LH B

12:00 – 1:00 p.m. Lunch Break, Story Student Center

1:00 – 1:30 Junior High Registration & Set Up Displays Olin Hall Lobby

1:00 – 4:30 Senior High Judging (Final Round) Olin 110

1:30 – 4:30 Junior High Judging, No Visitors Olin 124, Olin 131

2:00 – 2:45 NJAS Directors’ Meeting Olin 219

5:45 AWARDS AND SCHOLARSHIPS RECEPTION AND PRESENTATIONS

General Awards
Special Awards
Top Ten Awards – Juniors
Top Ten Awards – Seniors
Top Five Awards – Seniors
High School Scholarships
Collegiate Scholarships
Friend of Science Award
NAS Special Awards

First United Methodist Church
2723 N 50th Street, Lincoln, NE