

Department of Bioproducts and Biosystems Engineering

# **2019 Research Poster Session and Networking Reception**

**October 23, 2019**

**St. Paul Student Center, North Star Ballroom**



Department of  
**BIOPRODUCTS AND  
BIOSYSTEMS ENGINEERING**

---

UNIVERSITY OF MINNESOTA

## About the event

The Department of Bioproducts and Biosystems Engineering Research Poster Session and Networking Reception provides an opportunity for faculty, researchers, students, alumni, industry professionals, donors, and friends to meet and connect.

Additionally, department faculty, researchers, and students are able to share and receive feedback about their research. Posters are grouped based on the department's eight research areas:

- Air quality and agricultural systems
- Bioengineering, biotechnology, bioprocessing
- Biomass conversion and utilization
- Building systems
- Environmental management and sustainable systems
- Food
- Land and water resources
- Renewable energy

## Research Poster Contest

As an attendee, you get the chance to vote for the best research posters.

Each attendee gets five tickets to hand out to the best posters or presenters of his/her choice. Attendees can hand out more than one ticket to a presenter. The top three presenters with the most tickets at the end of the poster session will win prizes. Prizes are to be determined. Winners will be announced at a later date.

For more information, please contact Lucas Stolp, [stol0028@umn.edu](mailto:stol0028@umn.edu).



# Research Posters - Sorted by topic

## Air Quality and Agricultural Systems

Poster no.	Title	Author(s) *denotes the presenter
1	Air-quality Related Health Impacts Along Food System Supply Chains	Nina Domingo*, Tim Smith, Andrew Goodkind, Jason Hill
2	Computing Uncertainty in the Optimum Nitrogen Rate Using a Generalized Cost Function	Tyler Nigon*, Ce Yang, David Mulla, Daniel Kaiser
3	Atmospheric Pressure Non-Thermal Plasma for Sanitizing Animal Production Facility Air	Charles Schiappacasse*, Peng Peng, Nan Zhou, Yanling Cheng, Vikram Verma, Yuying Liang, Junjie Shao, Xiaoying Liu, Jie Zhai, Sally Nolls, Kevin Janni, Paul Chen, Nandini Singh, Roger Ruan
4	Estimate of Carbon Dioxide Balance on the Planet Earth	Kirk Cobb*
5	The Food We Eat, the Air We Breathe: A Review of the Fine Particulate Matter Induced Air Quality Health Impacts of the Global Food System	Srinidhi Balasubramanian*, Natalie Hunt, Madisen Gittlin, Nina Domingo, Kimberly Colgnan, Sumil Thakrar, Peter Adams, Spyros Pandis, Christopher Tessum, Julian Marshall, Jason Hill
6	Air Quality in the United States: What's Killing People and How Do We Stop It?	Sumil K. Thakrar*, Peter J. Adams, Joshua S. Apte, Srinidhi Balasubramanian, Julian D. Marshall, Spyros N. Pandis, Stephen Polasky, Allen L. Robinson, Christopher W. Tessum, Jason D. Hill
7	Incorporating Camelina into the Corn-soybean Landscape: a Life Cycle Fossil Energy Assessment	Natalie D Hunt*, Kimberly K Colgan, Axel Garcia y Garcia, Jason D Hill

## Bioengineering, Biotechnology, Bioprocessing

Poster no.	Title	Author(s) *denotes the presenter
8	Volatile Organic Pollutant Absorption and Biodegradation via Biofilms on Modified Carbon Fibers	Ben Frigo-Vaz*, Chao Xu, Ping Wang
9	Influence of Microalgae on Vegetable Production in Greenhouse Hydroponics	Shuhao Huo*, Junzhi Liu, Min Addy, Paul Chen, David Necas, Pengfei Cheng, Kun Li, Hope Chai, Yuhuan Liu, Roger Ruan

## Bioengineering, Biotechnology, Bioprocessing - cont.

Poster no.	Title	Author(s) *denotes the presenter
10	Improving Treatment Capacity and Process Stability via a Two-Stage Anaerobic Digestion of Food Waste Combining Solid-State Acidogenesis and Leachate Methanogenesis/Recirculation	Lingkan Ding, Yan Chen*, Bo Hu
11	Electrochemical Removal of Hydrogen Sulfide (H <sub>2</sub> S) from Waste Streams	Yuchuan Wang, Lingkan Ding*, Hongjian Lin, Bo Hu
12	Tribonema sp. and Chlorella zofingiensis co-culture to Treat Diluted Swine Wastewater from Fishery Wastewater Could Improve Harvest Efficiency	Pengfei Cheng*, Jay J. Cheng, Kirk Cobb, Chengxu Zhou, Nan Zhou, Min Addy, Paul Chen, Xiaojun Yan, Roger R. Ruan
13	De Novo Genome Assembly and Analysis of Glucose-Secreting Green Algae	Natalia Calixto Mancipe*, Brett Barney
14	Novel Associations between Phosphate Accumulating Fungi and Plants for Improved Uptake	Leif van Lierop*, Kathryn Bushley, Noah Strom, Bo Hu
15	Conversion of Paper Mill Residues to Fermentable Sugars	Ben Calkins*, Ulrike Tschirner
16	Increasing Nitrogen Release in Endosymbiont Gluconacetobacter Diazotrophicus with Gene Deletions	Erin Schwister*, Brett Barney
17	Biohydrogen Production in <i>A. Vinelandii</i>	Carolann Knutson*, Marnie Plunkett, Rachel Liming, Brett Barney
18	Increasing Feeding Value of Corn Ethanol Co-products via Yeast Engineering and Solid State Fermentation	Xiao Sun*, Fatemeh Heidari, Jingyu Wang, Tanner Barnharst, Bo Hu
19	The Roles of Thermal-Vacuum Stripping in Improving the Methane Production of Thermophilic AD of Swine Manure	Renchuan Zhang*, Paul Chen, and Roger Ruan
20	Magnetic Relaxation Switching (MRS) Assay for Direct Detection of Microbes in Complex Food Matrices	Vinni Thekkudan Novi*, Minh-Phuong Ngoc Bui, Abdennour Abbas

## Biomass Conversion and Utilization

Poster no.	Title	Author(s) *denotes the presenter
21	Functional Polymeric Materials with Very High Levels of Four Unmethylated Lignins	Yi-ru Chen*, Simo Sarkanen
22	Advancing Microalgal Biofertilizers: A Greenhouse Study of the Soil-Wheat System and the Replacement of Urea	Adriana Alvarez De La Hoz*, Sharon Weyers, Robert Gardner
23	Investigating the Degradation of Thermally-Modified Plant Biomass by Fire-Adapted Fungi	Hunter J. Simpson*, Jiwei Zhang, Jonathan S. Schilling
24	Improving the Properties of Poly(Lactic Acid) Using Bioplasticizers	Connor Williams*
25	Gene Regulatory Networks Enabling Fungi to Selectively Extract Sugars from Lignocellulose: Damage Control at the Hyphal Front	Jesus Castano*, Jiwei Zhang, Jonathan Schilling
26	Fungal Solid-State Fermentation of Mechanically Treated Canola Meal	Fatemeh Heidari*, Aravindan Rajendran, Margareth Åverland, Liv Torunn Mydland, Jon Åvrum Hansen, Pedro Urriola, Jerry Shurson, Bo Hu
27	Silicon Carbide Foam Supported ZSM-5 Structured Catalyst for Microwave-Assisted Pyrolysis of Biomass	Nan Zhou*, Shiyu Liu, Yaning Zhang, Liangliang Fan, Yanling Cheng, Paul Chen, Roger Ruan
28	Comparison of Productivity and Economic Analysis of Microalgae Cultivation in Open Raceway Ponds and Flat Panel Photobioreactors	Sudhanya Banerjee*, Shri Ramaswamy

## Building Systems

Poster no.	Title	Author(s) *denotes the presenter
29	Affordable Solid Panel "Perfect Wall" System	Pat Huelman*, Tom Schirber, Garrett Mosiman, Rolf Jacobson, Dan Handeen

## Environmental Management and Sustainable Systems

Poster no.	Title	Author(s) *denotes the presenter
30	Wetland Phosphorus Removal Through Process of Vegetation Harvesting	Nadia Alsadi*, Chris Lenhart, Joe Magner
31	Rapid and PCR-free DNA Detection of Invasive Species by Nanoaggregation-Enhanced Chemiluminescence Assay	Snober Ahmed*, Abdennour Abbas
32	Phytoremediation for Extracting Deicing Salt from Roadside Soils	Leif van Lierop*, Bo Hu
33	Novel Sorbent Technology for Simultaneous Removal and Degradation of Waterborne PFAS	John Brockgreitens*, Snober Ahmed, Abdennour Abbas

## Food

Poster no.	Title	Author(s) *denotes the presenter
34	Converting Almond Hulls to Functional Ingredients for Clean Label Food and Nutraceutical Products	Juer Liu*, Jun Wei, Li Huang, Peng Peng, Yanling Cheng, Paul Chen, Guangwei Huang, Roger Ruan
35	Effects of Intense Pulsed Light and Gamma Irradiation on Bacillus Cereus Spore in Mesquite Flour	Dongjie Chen*, Wes Mosher, Justin Wiertzema, Peng Peng, Min Min, Yanling Cheng, Xuotong Fan, Brendan Niemira, David J. Baumler, Chi Chen, Paul Chen, and Roger Ruan

## Land and Water Resources

Poster no.	Title	Author(s) *denotes the presenter
36	Illuminated Onsite Wastewater Treatment	Carlise Sorenson*, Carlos Zamalloa, Allison Arsenault, Bo Hu
37	Measuring Evapotranspiration in Central Minnesota Combining Temperature Data and Remote Sensing	Francisco Lahoud*
38	Estimating Lake Water Volume Using Scale Analysis	Chelsea Delaney*, John Nieber, Bruce Wilson, Kerry Holmberg, Jared Trost, Adam Heathcote
39	Saturated Buffers: Improving the Site Selection and Design Process	Nathan Utt*, Dario Canelon, Gary Sands
40	The Evolution of Remote Sensing of Flood Forecasting and Potential Improvement with Gravity Recovery and Climate Experiment (GRACE): A Review	Pai-Feng Victor Teng*, John Nieber