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Assistant Professor, Chemical Engineering
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EDUCATION

Ph.D., 2015, Environmental Engineering, University of Utah
M.S. 1992, Environmental Engineering, University of North Carolina Chapel Hill
B.S. 1988, Chemical Engineering, Purdue University

PROFESSIONAL EXPERIENCE

2015-present, Assistant Professor, Chemical Engineering
2013-present, Associate Director, Program for Air Quality, Health and Society
2010-2015, Research Associate, Chemical Engineering and Institute for Clean & Secure Energy and Chemical Engineering, University of Utah
2002-2010, Associate Director, Institute for Combustion & Energy Studies, University of Utah
2000-2010, Research Engineer, Institute for Combustion & Energy Studies, University of Utah
1996-2000, Research Engineer, University of Tennessee
1994-1996, Scientist, Fraunhofer Institute for Atmospheric Environmental Research (Germany)
1992-1993, Process Engineer, Radian Corp.

PROFESSIONAL AFFILIATIONS

AIChE Division Director and Area Chair (2018 – present); AAAR Newsletter associate editor (2019 – present); AAAR health effects of aerosols working group chair (2017 – 2019); Utah State Air Quality Policy Board (2017 – present); Utah State Air Quality Board (Vice Chair, 2009 - 2017); Salt Lake City Air Quality Advisory Committee (2016 – present); Utah Air Quality / Changing Climate Technical Advisory Team (2019-2020), Air & Waste Management Association, Great Basin Chapter Advisory Board (2007 – 2011); Utah DEQ Carbon Capture Advisory Committee; University of Utah Office of Sustainability Advisory Committee; University of Utah Clean Air Task Force, and Utah DEQ Clean Utah Partners Advisory Board.

PEER-REVIEWED PUBLICATIONS AND CONFERENCE PROCEEDINGS

My graduate students are underlined and *my undergraduate research assistants are italicized and underlined*.

E. Chadwick, *K. Le*, Z. Pei, T. Sayahi, A. Butterfield, **K. Kelly** (accepted) Using a Low-cost Sensor Network to Understand the Effect of COVID-19 on Particle Pollution. *Journal of Aerosol Science.*

A.D. Workman, B.S. Bleier, T. Sayahi, **K.E. Kelly**, P.C. Song (in press) Aerosol scavenging isolation barrier mitigates exposure risk during endonasal procedures in COVID-19. *International Forum of Allergy & Rhinology.* doi/10.1002/alr.22752

A. Gill, G. Oakley, M. Error, **K. Kelly**, R. Orlandi, J. Alt (2021) Optimizing clinical productivity in otolaryngology clinic during the COVID-19 pandemic. *International Forum of Allergy & Rhinology.* doi/10.1002/alr.22766

K.E. Kelly, W. Xing, P. Goffin, T. Sayahi, T. Becnel, A. Biglari, P.-E. Gaillardon, A. E. Butterfield, M. Meyer, R.T. Whitaker (2021) Community-based measurements reveal unseen differences during air-pollution episodes. *Environmental Science & Technology.* 2021, 55, 1, 120–128 https://doi.org/10.1021/acs.est.0c02341

I.M. Errigo, B.W. Abbott, L.Mitchell, D.L. Mendoza, S.S. Sayedi, J. Glenn, J.D. Beard, S. Bratsman, T. Carter, R.A. Chaney, A. Follett, A. Freeman, R.J. Frei, Mi. Greenhalgh, H. Holmes, P.D. Howe, J.D. Johnston, **K.E. Kelly,** L. Lange, R. Martin, A. Stacey, T. Tran, D. Wilson (2020) Human health and economic costs of air pollution in Utah: an expert assessment, *Atmosphere*. 11, 1238. https://doi.org/10.3390/atmos11111238

H. Hedworth, T. Sayahi, **K.E. Kelly**, A. Saad (in press) The effectiveness of drones in measuring particulate matter. *Journal of Aerosol Science.*

D. Malia, A. Kochanski, **K.E. Kelly**, R.T. Whitaker, W. Xing, L. Mitchell, A. Jacques, A. Farguell, J. Mandel, P.-E. Gaillardon, T. Becnel, S. Krueger (2020) Evaluating wildfire smoke transport within a coupled fire-atmosphere model using a novel high-density instrumentation network. *AGU Atmospheres*. 125, e2020JD032712. https://doi.org/10.1029/2020JD032712

T. Sayahi, C. Nielson, Y. Yu, K. Neuberger, M. Seipp, M.A. Firpo, K.E. Kelly, A.H. Park (2020) Airborne Aerosolized Mouse Cytomegalovirus From Common Otolaryngology Procedures. Journal of Otolaryngology-Head and Neck Surgery. DOI: 10.1177/0194599820957966/ ID: OTO-201298

K. Kaur, D. Overacker, H. Ghandehari, C. Reilly, R. Paine III, **K.E. Kelly** (2021) Determining real-time mass deposition with a quartz crystal microbalance in an electrostatic, parallel-flow, air-liquid interface exposure system. *Journal of Aerosol Science.* 151, 105653. https://doi.org/10.1016/j.jaerosci.2020.105653

T. Sayahi, A. Garff, T. Quah, K. Le, T. Becnel, K. Powell, P.-E. Gaillardon, A.E. Butterfield, **K.E. Kelly** (2020) Long-term calibration models to estimate ozone concentrations with a metal oxide sensor. *Environmental Pollution* 267, 115363. https://doi.org/10.1016/j.envpol.2020.115363

J. Moore, *M. Dailey*, *Z. Wilhelm*, **K.E. Kelly**, P. Goffin, J. Wiese, W. Xing, *K.M. Le*, T. Becnel, P.E. Gaillardon, AE. Butterfield (2020) Engaging pre-college students in hypothesis generation using a citizen scientist network of air quality sensors. *Proc. ASEE Annual Meeting*, K-12 Education Session.

C. Mullen, S. Grineski, T. Collins, W. Xing, R. Whitaker, T. Sayahi, T. Becnel, P. Goffin, P.E. Gaillardon, M. Meyer, **K. Kelly** (2020) Patterns of distributive environmental inequity under different $PM_{2.5}$ air pollution scenarios for Salt Lake County public schools. *Environmental Research* 186 109543. https://doi.org/10.1016/j.envres.2020.109543

M. Cadrazco, A. Santamaría, I.C. Jaramillo, K. Kaur, **K.E. Kelly**, J. R. Agudelo (2020) Characterization of renewable diesel particulate matter gathered from non-premixed and partially premixed flame burners. *Combustion & Flame*. Volume 214, Pages 65-79. https://doi.org/10.1016/j.combustflame.2019.12.018

S. Hegde, K.T. Min, J. Moore, P. Lundrigan, N. Patwari, S. Collingwood, A. Balch, **K.E. Kelly** (2020) Household indoor particulate matter measurement using a network of low-cost sensors, *Aerosol and Air Quality Research.* Volume: 20, Issue: 2, 381-394. DOI: 10.4209/aaqr.2019.01.0046

T. Becnel, *K. Tingey, J. Whitaker*, T. Sayahi, *K. Le*, P. Goffin, A. Butterfield, **K. Kelly**, Pierre-Emmanuel Gaillardon (2019) A distributed low-cost pollution monitoring platform. Volume 6, Issue 6, December 2019, 10738-10748 *Internet of Things Journal* https://doi.org/10.1109/JIOT.2019.2941374

K. Kaur, R. Mohammadpour, I.C. Jaramillo, H. Ghandehari, C. Reilly, R. Paine, **K.E. Kelly** (2019) Application of a quartz crystal microbalance to measure the mass concentration of combustion particle suspensions, *Journal of Aerosol Science*. Volume 137, November 2019, 105445 https://doi.org/10.1016/j.jaerosci.2019.105445

T. Sayahi, *D. Kaufman*, T. Becnel, K. Kaur, A. Butterfield, S. Collingwood, Y. Zhang, P.-E. Gaillardon, **K.E. Kelly** (2019) Development of a calibration chamber to evaluate the performance of low-cost particulate matter sensors, *Environmental Pollution*. 255, 113131. https://doi.org/10.1016/j.envpol.2019.113131

K. Kaur, I.C. Jaramillo, R. Mohammadpour, A. Sturrock, H. Ghandehari, C. Reilly, R. Paine III, **K.E. Kelly** (2019) Effect of collection methods on combustion particle physicochemical properties and their biological response in a human macrophage-like cell line, *Journal of Environmental Science and Health Part A,* 1-16. https://doi.org/10.1080/10934529.2019.1632626

T. Becnel, *K. Le*, A.E. Butterfield, **K.E. Kelly**, P.E. Giallardon (2019) A recursive approach to partially blind calibration of a pollution sensor network, *Proceedings of the 2019 IEEE International Conference on Embedded Software and Systems (ICESS)*, June 2 – 3, Las Vegas, NV https://doi.org/10.1109/ICESS.2019.8782523

T. Sayahi, A. Butterfield, **K.E. Kelly** (2019) Long-term field evaluation of the Plantower PMS low-cost particulate matter sensors, *Environmental Pollution,* 245, 932-940. https://doi.org/10.1016/j.envpol.2018.11.065

P. Lundrigan, K.T Min, N. Patwari, S.K. Kasera, **K. Kelly**, J. Moore, M. Meyer, S.C. Collingwood, F. Nkoy, B. Stone, K. Sward (2018) EpiFi: An in-home IoT architecture for epidemiological deployments, *Proc. 2018 IEEE 43rd Conference on Local Computer Networks (LCN),* October 1 – 4, Chicago, IL.

K. Le, T. Butterfield, T. Becnel, P.E. Gaillardon, **K.E. Kelly** (2018) Citizen scientist engagement in air quality monitoring, *Proc. ASEE Annual Meeting,* June 23 – 27, Salt Lake City, UT.

K. Le, K. Tingey, T. Becnel, P. Gaillardon, T. Butterfield, **K.E. Kelly** (2018) Building air quality sensors & inspiring citizen scientists, *Chemical Engineering Education*, 52, 3, 193-201. **William H. Corcoran Award for the best paper in Chemical Engineering Education in 2018.**

I.C. Jaramillo, A. Sturrock, H. Ghiassi, D.J. Woller, C.E Deering-Rice, J.S. Lighty, R. Paine, C. Reilly, **K.E. Kelly** (2017) Effects of biofuel and reference diesel particulates on pro-inflammatory, arylhydrocarbon receptor, and oxidant/electrophile-sensitive signaling in lung cells. *Journal of Environmental Science and Health.* Part A, 53:4, 295-309. https://doi.org/10.1080/10934529.2017.1400793

M. Baasandorj, S.W. Hoch, R. Bares, J.C. Lin, S.S. Brown, D.B. Millet, R. Martin, **K.E. Kelly**, C. Jaramillo, K.J. Zarzana, W.P. Dube, G. Tonnesen, C.D. Whiteman, J. Sohl (2017) Contribution of early morning and nighttime chemistry to wintertime $PM_{2.5}$ pollution episodes in Salt Lake Valley, Utah. *Environmental Science & Technology.* 51(11):5941-5950. doi: 10.1021/acs.est.6b06603.

H. Zhang, Y**.** Wu, S**.** Li, **K.E. Kelly**, E.G. Eddings (2017) Underground in Situ Coal Thermal Treatment for Synthesis Fuels Production. *Progress in Energy and Combustion Science.* 62, 1-32. https://doi.org/10.1016/j.pecs.2017.05.003

K.E. Kelly, *J. Whitaker*, *A. Petty*, *C. Widmer*, A. Dybwad, D. Sleeth, R. Martin, A. Butterfield (2017) Ambient and laboratory evaluation of a low-cost particulate matter sensor, *Environmental Research*. 221, 491-500. http://dx.doi.org/10.1016/j.envpol.2016.12.039

W.M. Eldredge, P. Toth, L. Centauri, E.G. Eddings, **K.E. Kelly**, T.A. Ring, A. Schoenbucher, J.N. Thornock, P.J. Smith (2016) A collaboration-based approach to CFD model validation and uncertainty quantification (VUQ) using data from a laminar helium plume, *Flow, Turbulence and Combustion*. 1-23. http://link.springer.com/article/10.1007/s10494-016-9708-7

J. Wilkey, **K.E. Kelly**, I.C. Jaramillo, J.P. Spinti, T. Ring, M. Hogue (2016) Predicting emissions from oil and gas operations in the Uinta Basin, *Journal of the Air & Waste Management Association.* 66(5), 528-45. doi: 10.1080/10962247.2016.1153529.

K.E. Kelly, D. Wang, M. Hradisky, G.D. Silcox, P.J. Smith, E.G. Eddings, D.W. Pershing (2016). Evaluating underground coal thermal treatment as a potential low-carbon energy source, *Fuel Processing Technology*, 144, 8–19. doi:10.1016/j.fuproc.2015.12.006

K.E. Kelly, Z. Luo, Tao Wang, E.G. Eddings (2016) Joint NSF-NSFC workshop on combustion related to sustainable energy, *Combustion Science & Technology,* 188(2), 247-249. http://www.tandfonline.com/doi/full/10.1080/00102202.2015.1089239

K.E. Kelly, J.E. Wilkey, J.P. Spinti, T.A. Ring, D.W. Pershing (2014) Oxyfiring with CO_2 capture to meet low-carbon fuel standards for unconventional fuels from Utah, *International Journal of Greenhouse Gas Control,* 22, 189–199.

D. Rezaei, Y. Zhou, J. Zhang, **K.E. Kelly**, E. Eddings, R. Pugmire, M. Ronald, Solum, J. Wendt (2013) The effect of coal composition on ignition and flame stability in coaxial flames, *Energy & Fuels,* 27 (8), 4935–4945.

K.E. Kelly, R. Kotchenruther, R. Kuprov, G.D. Silcox (2013) Receptor model source attributions for Utah's Salt Lake City airshed and the impacts of wintertime secondary ammonium nitrate and ammonium chloride aerosol, *Journal of the Air & Waste Management Association*, 63(5), 575-590.

G.D. Silcox, **K.E. Kelly**, E.T. Crosman, C.D. Whiteman, B.L. Allen (2012) Wintertime $PM_{2.5}$ concentrations during persistent, multi-day cold-air pools in a mountain valley, *Atmospheric Environment,* 46, 17-24.

K.E. Kelly, G.D. Silcox, A.F. Sarofim, D.W. Pershing (2011). An evaluation of ex situ, industrial-scale, aqueous CO_2 mineralization, *International Journal of Greenhouse Gas Control Technologies*, 5, 1587–1595.

J. Zhang, **K.E. Kelly**, E.G. Eddings, J.O.L. Wendt (2011) Ignition in 40 kW co-axial turbulent diffusion oxy-coal jet flames, *Proceedings of the Combustion Institute*, 33(2), 3375-3382.

K.E. Kelly, I.C. Jaramillo, M. Quintero-Núñez, D.A. Wagner, K. Collins, H.L.C. Meuzeelar, J.S. Lighty (2010) Low-wind/high particulate matter episodes in the Calexico/Mexicali region, *Journal of the Air & Waste Management Association, 59:*1173-1185.

A.F. Sarofim, **K.E. Kelly** (2010) Foreward in: *Handbook of Combustion,* M. Lackner; F. Winter; K. Avinash (eds), Wiley-VHC, Weinheim, Germany.

M.Gawlowski, **K.E. Kelly**, L.A. Marcotte, A. Schönbucher (2009) Determining the effect of species composition on temperature fields of tank flames using real-time holographic interferometry, *Applied Optics,* 48(23), 4625- 4636.

J.G. Staniswalis, H. Yang, W.-W. Li, **K.E. Kelly** (2009) Using a continuous time lag to determine the associations between ambient $PM_{2.5}$ hourly levels and daily mortality: indication of the importance of the total number of particles, *Journal of the Air & Waste Management Association,* 59, 1173-1185.

A. Braun, F.E. Huggins, A. Kubátová, S. Wirick, M.M. Maricq, B.S. Mun, J.D. McDonald, **K.E. Kelly**, N. Shah, G.P. Huffman (2008) Toward distinguishing woodsmoke and diesel exhaust in ambient particulate matter, *Environmental Science & Technology,* 42(2), 374-380.

K. Kelly, M. Quintero Núñez, F.A. Vazquez, K. Collins, D.A. Wagner, J. Lighty (2006) Black carbon and polycyclic aromatic hydrocarbon emissions from vehicles in the U.S. – Mexico border region: pilot study, *Journal of the Air & Waste Management Association, **56**,* 285-293.

A. Braun, N. Shah, F.E. Huggins, **K. Kelly**, A. Sarofim, C. Jacobsen, S. Wirick, H. Francis, J. Ilavsky, G.E. Thomas, G.P. Huffman (2005) X-ray scattering and spectroscopy studies on diesel soot from oxygenated fuel under various engine load conditions, *CARBON*, 43, 2588-2599.

W.P. Arnott, B. Zielinska, C.F. Rogers, J. Sagebiel, K. Park, J. Chow, H. Moosmüller, J.G. Watson, **K.E. Kelly**, D. Wagner, A. Sarofim, J. Lighty, G. Palmer (2005) Evaluation of 1047-nm photoacoustic instruments and photoelectric aerosol sensors in source-sampling of black carbon aerosol and particle-bound PAHs from gasoline and diesel powered vehicles, *Environmental Science & Technology,* 39, 5398-5406.

P. Jiang, D.O. Lignell, **K. Kelly**, C.J. Montgomery, J.S. Lighty, A.F. Sarofim (2005) Simulation of the evolution of particle size distribution in a vehicle exhaust plume with unconfined dilution by ambient air, *Journal of the Air & Waste Management Association*, 54, 437-445.

C.F. Rogers, W.P. Arnott, B. Zielinska, J. Sagebiel, **K.E. Kelly**, D.A. Wagner, J.S. Lighty, A.F. Sarofim (2005) Real-time measurements of jet aircraft engine exhaust, *Journal of the Air & Waste Management Association*, 55, 583-593.

K.E. Kelly, B. Zielinska, D.A. Wagner, M. McDaniel, J.S. Lighty, A.F. Sarofim (2004) Effect of diesel and JP8 fuels on particulate emissions, *Military Engineer*, 629, 62-65.

K.E. Kelly, D.A. Wagner, B. Bretecher, B. Holden, K. Sahay, Z. Nardi, J.S. Lighty, A.S. Sarofim, N. Helgeson (2004) Evaluation of catalyzed and electrically heated soot filters for removal of particulate emissions from diesel and JP-8 fueled engines, *Journal of the Air & Waste Management Association*, 54*,* 83-92.

B. Zielinska, J. Sagebiel, W.P. Arnott, C.F. Rogers, **K.E. Kelly**, D.A. Wagner, J.S. Lighty, A.F. Sarofim, G. Palmer (2004) Phase and size distribution of polycyclic aromatic hydrocarbons

in diesel and gasoline vehicle emissions, *Environmental Science & Technology,* 38, 2557-2567.

A. Braun, N. Shah, F. Huggins, G.P. Huffman, S. Wirick, C. Jacobsen, **K.E. Kelly**, A. Sarofim (2004) A study of diesel PM with X-ray, microspectroscopy, *FUEL*. 83(7/8), 997-1000.

A. Braun, F. Huggins, S. Seifert, J. Ilavsky, N. Shah, **K.E. Kelly**, A.F. Sarofim, G.P. Huffman (2004) Size-range analysis of diesel soot with ultra-small angle X-ray scattering. *Combustion and Flame* 137(1/2), 63-72.

K.E. Kelly, D.A. Wagner, J. S. Lighty, A.F. Sarofim, C.F. Rogers, J. Sagebiel, B. Zielinska, W.P. Arnott, and G. Palmer (2003) Characterization of exhaust particles from military vehicles fueled with diesel, gasoline, and JP-8, *Journal of the Air & Waste Management Association*, 53, 273-282.

C.F. Rogers, J.C. Sagebiel, B. Zielinska, W.P. Arnott, E.M. Fujita, J.D. McDonald, J.B. Griffin, **K. Kelly**, D. Overacker, D., Wagner, J. Lighty, A. Sarofim, G. Palmer (2003) Characterization of submicron exhaust particles from engines operating without load on diesel and JP-8 fuels*, Aerosol Science & Technol*ogy, 37(4), 355-368.

Kelly K.E., J.G. Overly, M.L. Socolof, G.A. Davis (1998) Environmental evaluation of molding exterior body panels in color, *SAE Transactions*, Paper number 982121.

Kelly K.E., G.A. Davis (1998) Comparison of methods for calculating use-stage environmental burdens for an automobile, SAE Paper 982199.

K.E. Kelly (1991) Ozone-Induced PCE Decomposition in Natural Waters, Masters Thesis, University of North Carolina-Chapel Hill.

BOOKS AND CHAPTERS

K.E Kelly (2020) Particulate Matter and the Wasatch Front. *In: Air Quality in Utah,* H. Crimmel (ed). University of Utah Press, Salt Lake City, UT.

K.E. Kelly, J.C. Ruple, J. Wilkey (2016) Oil shale development, air quality, and carbon management, Chapter 12, in: Oil Shale Development in Utah, J.P. Spinti (ed). Taylor and Francis.

Currey, **K.E. Kelly**, W.W. Li, H.L.C. Meuzelaar, A.F. Sarofim (eds) (2005) *The U.S.-Mexican Border Environment: Particulate Matter Issues, SCERP Monograph Series* (A. Sweedler, series editor), Southwest Center for Environmental Research and Policy, San Diego State University Press.

Borrell P., P.M. Borrell, T. Cvitas, **K.E. Kelly**, W. Seiler (eds.) (1998) *Transport and Chemical Transformation of Pollutants in the Troposphere*, 10 volume series, Springer Verlag, Heidelberg Germany.

Borrell P., P.M. Borrell, **K.E. Kelly**, W. Seiler (eds) (1997) *Proceedings of the 1998 EUROTRAC Symposium,* Springer Verlag, Heidelberg Germany.

PEER-REVIEWED PUBLICATIONS IN PROGRESS

S. Hegde, K. Carlson; H. Malik; S.K. Mohanty; **K.E. Kelly** (in revision) Detecting Benzene via a Low-cost Nanostructured TiO2 Sensor, *Sensors & Actuators: B. Chemical*

SELECTED PRESENTATIONS

K. Kelly, Air Quality Community Q&A, Sponsored by GirlScout Troup 127. February 2, 2021.

T. Sayahi, A. Garff, T. Quah, K. Le, T. Becnel, K. Powell, P.-E. Gaillardon, A. Butterfield, **K. Kelly**, Long-Term Calibration Models to Predict Ozone Levels with a Metal Oxide Sensor, AIChE Annual Meeting, November 15 – 19, 2020.

K. E. Kelly, N. Daher, *invited.* Woodburning in Utah, a Historical Perspective, Resource Development Coordinating Committee, Public Lands Policy Coordinating Office, November 5, 2020.

K.E. Kelly, *invited.* Public Interest Technology Symposium, University of Utah, October 28, 2020.

E. Chadwick, *K. Le*, Z. Pei, T. Sayahi, A. Butterfield, **K. Kelly** Using a Low-cost Sensor Network to Understand the Effect of COVID-19 on Particle Pollution. Science for Solutions Virtual conference, June 18, 2020. **Student poster award winner.**

D.V. Malia, A. Kochanski, **K.E. Kelly**, R. Whitaker, W. Xing, L. Mitchel, A. Jacques, A. Farguell, J. Mandel, P-E. Gaillardon, T. Becnel, S. Krueger, Evaluating wildfire smoke transport within a coupled fire-1 atmosphere model using a novel high-density instrumentation network, Science for SolutionsVirtual conference, June 18, 2020.

K. Kelly, *Invited speaker.* Historical wood-burning trends and effect of COVID on local air quality. UCAIR partners meeting. May 15, 2020.

K. Kelly, *Invited panelist*. L3 and Girl scouts International Women's Day Celebration. March 5, 2020.

Mullen, C., Grineski, S., Collins, T., Xing, W., Whitaker, R., Sayahi, T., Becnel, T., Goffin, P., Gaillardon, P.-E., Meyer, M. and **K. Kelly**. Distributive environmental injustice at Salt Lake County public schools for different PM2.5 air pollution scenarios. Global Change & Sustainability Center 2020 Environment & Sustainability Research Symposium, University of Utah, Salt Lake City, UT. February 2020. [Poster Session].

D.V. Mallia, A. Kochanski, **K.E. Kelly**, R.T. Whitaker, W. Xing, L. Mitchell, A. Jacques, A. Farguell, J. Mandel, and S. Krueger, Validating wildfire smoke transport within a coupled fire-atmosphere model using a novel high-density instrumentation network, Smoke Symposium, UC Davis, California, April 20-24, 2020.

K. Kelly, *invited*, early career award talk, Community-engaged environmental measurements. AIChE Annual Meeting, Orlando, FL, November 10-15, 2019.

K. Kelly, W. Xing, P. Goffin, T. Sayahi, T. Becnel, P-E. Gaillardon, A.E. Butterfield, M. Meyer, R. Whitaker, Understanding how pollution episodes affect community-level air quality with a distributed sensor network, AIChE Annual Meeting, Orlando, FL, November 10-15, 2019.

J. Moore, W. Xing, *M. Dailey*, *K. Le*, T. Becnel, P. Goffin, M. Meyer, P-E Gaillardon, R. Whitaker, J. Wiese, A.E. Butterfield, **K.E. Kelly**, Engaging middle and high school students in hypothesis generation using a citizen-scientist network of air quality sensors, AIChE Annual Meeting, Orlando, FL, November 10-15, 2019.

S. Wickelson, A.E. Butterfield, *M. Dailey*, **K.E. Kelly,** Using air-quality challenges to engage students in science and engineering, National Science Teachers Association Annual Meeting, Salt Lake City, Utah, October 25, 2019.

K. Kelly, *invited speaker*, *The Air We Breathe*, Environmental Health Literacy, Salt Lake City, UT, October 2, 2019,.

K. Kelly, P. Gaillardon, R. Whitaker *invited speaker,* Internal Medicine Grand Rounds, AQ&U: community-engaged, network for understanding geospatial differences in pollution, Salt Lake City, UT, September 25, 2019.

K. Kelly, *invited speaker,* Estimating wood-burning contributions to PM2.5 levels along the Wasatch Front. US EPA Region 8, environmental monitoring annual meeting. Salt Lake City, UT, September 11, 2019.

K. Kelly, *invited speaker,* Low-cost particulate matter sensing, a different perspective. US EPA Region 8, environmental monitoring annual meeting. Salt Lake City, UT, September 11, 2019.

K. Kelly, *invited panelist,* USTAR technology innovation summit, air quality solutions. Salt Lake City, UT. April 1, 2019.

K. Kelly, *invited,* Community-engaged air quality measurements in Utah. Utah State University Seminar Series, February 14, 2019.

K. Kelly, *invited,* Community-engaged air quality measurements in the Salt Lake Valley. University of Utah Pulmonary Research Progress, February 13, 2019.

K. Kelly, *invited panelist*, Community-based air quality measurements in the Salt Lake Valley. University of Utah Wallace Stegner Environmental Dispute Resolution Program, Dialogue on Air Quality, December 6, 2018.

K. Kelly, *invited,* Community-based air quality measurements in the Salt Lake Valley. Atmospheric Sciences Graduate Seminar, November 28, 2018.

K. Kelly, *invited,* Low-cost sensing and community air quality. Capitol Hill Community Council, September 12, 2018.

K. Kaur, I.C. Jaramillo, R. Mohammadpour, A. Sturrock, R. Paine, C. Reilly, H. Ghandehari, **K. Kelly** Platform: Effect of Combustion Particle Size on Pathologically Important Responses in Lung Cells. 10th International Aerosol Conference, September 2nd-7th, St. Louis, Mo.

T. Sayahi, P.-E. Gaillardon, R. Whitaker, M. Meyer, T. Butterfield, P. Goffin, T. Becnel, A. Biglari, D. Kaufman, T. Sayahi, W. Xing, **K. Kelly** Platform: Effect of Combustion Particle Size on
Pathologically Important Responses in Lung Cells. 10th International Aerosol Conference, September 2nd-7th, St. Louis, Mo.

K.E. Kelly, P.-E. Gaillardon, R. Whitaker, M. Meyer, T. Butterfield, P. Goffin, T. Becnel, A. Biglari, D. Kaufman, T. Sayahi, W. Xing, Poster: A layered framework for integrating low-cost sensor data and for engaging citizens to understand $PM_{2.5}$ exposure. 10th International Aerosol Conference, September 2nd-7th, St. Louis, Mo.

K.E. Kelly, *Invited Mini-Keynote* Using low-cost IoT solutions to understand and address local air-quality challenges, MPSoC, July 31, 2018, Snowbird, UT.

T. Sayahi, **K.E. Kelly**, AQandU Project: evaluation of a low-cost air quality sensor network in the Wasatch front, United States, International Network of Environmental Forensics (INEF) annual conference, Platform Presentation, June 25th-27th, 2018, University of Utah, Salt Lake City, Utah, United States of America.

K.E. Kelly, *Invited speaker.* Low-cost sensing of pollution variation within communities. US Ignite, Kansas City, MO, March 27, 2018.

K.E. Kelly, *Keynote speaker.* How engineers can help understand and address our air quality challenges, Utah Engineering Council, Sandy, UT, February 24, 2018.

K.E. Kelly, P. Arent, D. Mendoza, T. Bingham, Jared Campbell. *Bennion Center Panel Discussion: Air Quality and Utah.* December 8, 2017.

K. Le, A. Butterfield, **K. Kelly** Building Block Air Quality Sensors. AIChE Annual Meeting. Minneapolis, MN. November, 2017.

K.E. Kelly, M. Meyer. *Invited speaker.* SLC Library TechTalks: Air Quality and You. November, 9, 2017.

K.E. Kelly, *Invited panelist.* Science & Civics: Clean Air in Utah, July 20, 2017.

T. Sayahi, **K.E. Kelly**, Laboratory and Field Calibration of Low-Cost Particulate Matter Sensors. AAAR Annual Meeting, Raleigh, NC, October 16 – 20, 2017.

K.E. Kelly, *Invited speaker.* Fine Particulate Matter, Health Effects, Sources, and US Regulations, North China Electric Power University, Baoding, China, June 27, 2017.

A. Sturrock , D. Woller, N. Harlan, I. Jaramillo , **K. Kelly,** J. Lighty , R. Paine, Benzo(a)pyrene suppresses GM-CSF expression in primary murine alveolar epithelial cells through activity of the aryl hydrocarbon receptor, ATS Annual Meeting. Washington, DC. May 2017.

K. Kelly, T. Sayahi, *A. Petty*, A. Butterfield Evaluation of the Plantower PMS Low-Cost Particulate Matter Sensor, Air Quality: Science for Solutions, Salt Lake City, UT March, 30, 2017.

K.E. Kelly *Invited Speaker*. Local Differences in Air Quality & Low-Cost Sensing. January 19, 2017. Clean Air Consortium Panel Discussion, Logan, UT.

K.E. Kelly *Invited Speaker*. Fine Particles, Regional Haze, and Low-Cost Particulate Sensing. November 2, 2016. BIXPO Energy Conference, Gwangju, South Korea.

K.E. Kelly, I.C. Jaramillo, A.Sturrock, H. Ghiassi, D.J. Woller, C.E Deering-Rice, C. Reilly, R. Paine, J.S. Lighty (submitted) Effects of biofuel and reference diesel particulates on pro-inflammatory, arylhydrocarbon receptor, and oxidant/electrophile-sensitive signaling in lung cells. AIChE 2017Annual Meeting, November 13 – 18, San Francisco, CA.

K.E. Kelly *Invited Panel Presentation:* Understanding Utah's Air Quality, October 5, 2016. Utah Air & Energy Summit, Salt Lake City, UT.

K.E. Kelly *Invited Lecture:* Low-Cost, Air Quality Sensing, September 21, 2016. Air Quality Retreat: Measurements, Modeling and Data Integration for Air Quality and Health, University of Utah.

K.E. Kelly *Invited Lecture:* Low-Cost, Air Quality Sensing: Opportunities and Challenges for Understanding Personal Exposure, September 22, 2016. Mountain West Regional Chapter of the Society of Toxicology Annual Meeting, September 21 - 23, University of Utah.

K.E. Kelly, R. Paine *Invited Lecture:* From Particles to People: Why Utah Struggles with Air Quality and How this Affects Human Health, February 16, 2016. Wallace Stegner Center Lecture Series, S.J. Quinney College of Law, University of Utah.

K.E. Kelly, *Invited Lecture:* Seasonal Importance of Biomass Combustion in the United States. Chinese Association of Science and Technology in Utah Symposium. January 12, 2016. 3rd Sino-US Workshop on Sustainability: Issues at the Nexus of Energy, Water, Climate and Air Pollution, Peking University, Beijing, China.

K.E. Kelly, *Invited Lecture:* Air Quality Challenges in Utah and Implications for Air Quality in China: Understanding the Sources and Working Toward Solutions. Chinese Association of Science and Technology in Utah Symposium. January 16, 2016. University Guest House, Salt Lake City, UT.

D. Wang, **K. Kelly,** E. Eddings, Liquid and Gaseous Hydrocarbons from Underground Coal Thermal Treatment, presentation at the 2015 AIChE Annual Meeting, Salt Lake City, UT, November 9-13, 2015. 11/2015.

K.E. Kelly, B. LeBaron, S. Lyman, M. McKee, L. Peacock, *Invited Panel Presentation:* New Ozone Standards in Utah. Utah Air-Energy Summit. October 27, 2015. Hilton Conference Center, Salt Lake City, UT.

J. Wilkey, M. Hradisky, J. Spinti, P.J. Smith, T. Ring., **K. Kelly**, Economic Analysis of In Situ Oil Shale Development in the Uinta Basin. 35th Oil Shale Symposium. October 5-6, 2015, Salt Lake City, UT.

J. Wilkey, T. Ring, J. Spinti, D. Pasqualini**, K. Kelly**, M. Hogue, I.C. Jaramillo, Predicting Emissions from Oil and Gas Operations in the Uinta Basin. In Air Quality in Utah: Science for Solutions Workshop. Vernal, UT: Utah Division of Air Quality, July 28, 2015.

K.E. Kelly, *Invited Lecture*: Fine Particulate Matter and Mercury: Source Attribution and the Role of Coal-Fired Power Plants, November 10, 2014. North China Electric Power University, Baoding, China.

K.E. Kelly, *Invited Lecture*: Fine Particulate Matter and Mercury: Source Attribution and the Role of Coal-Fired Power Plants, November 10, 2014. North China Electric Power University, Baoding, China.

K.E. Kelly, *Keynote Lecture:* Understanding the Contributors and Developing Strategies to Address Air Quality during Wintertime Inversions along the Wasatch Front. *31st Annual Utah Conference on Safety and Industrial Hygiene,* October 17, 2014.

K.E. Kelly, Winter-Time Inversions: Where Do The Particles Come From? *Utah Environmental Health Association Annual Meeting,* West Jordan, UT, September 10-12, 2014.

K.E. Kelly, Contributions to Poor Winter-time Air Quality in Utah. *Utah Chapter of the Society of Petroleum Engineers Annual Dinner,* August 26, 2014.

K.E. Kelly, D. Wang, E.G. Eddings, D.W. Pershing, Comprehensive Greenhouse Gas Evaluation of Underground Coal Thermal Treatment for Production of Syngas and Liquid Fuels. *Clearwater Energy Conference*, June 2014.

K.E. Kelly, Contribution of Woodsmoke to Fine Particulate Matter during Wintertime Inversions. *Utah Division of Air Quality,* January 15, 2014.

K.E. Kelly, Air Quality in the Wasatch Front. *Salt Lake Chamber of Commerce: Clean Air Summit*, December 5, 2013.

K. E. Kelly, Contribution of Woodsmoke to Fine Particulate Matter during Wintertime Inversions along the Wasatch Front, *American Association of Pediatricians, Utah Chapter Annual Meeting*. November, 7 2013.

G.D. Silcox, **K.E. Kelly**, Characterizing $PM_{2.5}$ in a Mountain Valley: A Community Engagement Project, AIChE Annual Meeting, *AIChE Annual Meeting*, November 3-8, 2013, Salt Lake City, UT.

T.A. Ring, A.F. Sarofim, **K.E. Kelly**, E.G. Eddings, Effect of Soot Chemistry and Structure On the Uncertainty in the Atmospheric Aerosols Irradiative Forcing Component *AIChE Annual Meeting*, November 8-12, 2010, Salt Lake City, UT.

D.M. Rezaei, Y. Zhou, J. Zhang, **K.E. Kelly**, E.G. Eddings, J.O.L. Wendt, The effect of coal composition on ignition and flame stability in co-axial oxy-fuel turbulent diffusion flames, AIChE Annual Meeting, November 8-12, 2010, Salt Lake City, UT.

J. Zhang, K.E. Kelly, E.G. Eddings, J.O.L. Wendt, Experimental studies of ignition in 40kW co-axial turbulent diffusion oxy-coal jet flames, , *AIChE Annual Meeting*, November 8-12, Salt Lake City, UT.

K.E. Kelly, T.A. Ring, J. Wilkey, B. Castro, A.F. Sarofim, D. W. Pershing, Opportunities for Oxyfiring to Reduce Upstream Life-Cycle Greenhouse Gas Emissions from Transportation Fuels, *AIChE Annual Meeting*, November 8-12, Salt Lake City, UT.

D.M. Rezaei, Y. Zhou, J. Zhang, **K.E. Kelly**, E.G. Eddings, J.O.L. Wendt, The Effect of Coal Composition on Ignition and Flame Stability in Co-axial Oxy-Fuel Turbulent Diffusion Flames, 2010 International Pittsburgh Coal Conference Istanbul, Turkey, October 11-14, 2010.

T.A. Ring, J. Zhang, H. el Gendy, J.O.L. Wendt, **K.E. Kelly**, E.G. Eddings, High Speed Video Analysis of Oxycoal Combustion In 40kw Coaxial Turbulent Diffusion Flames, 2010 International Pittsburgh Coal Conference Istanbul, Turkey, October 11-14, 2010.

J. Zhang, **K.E. Kelly**, E.G. Eddings, J.O.L. Wendt, An experimental study of ignition in 40kW co-axial turbulent diffusion oxy-coal jet flames, Clearwater Coal Conference, June 9, 2010.

K.E. Kelly, A.F. Sarofim, D.W. Pershing, Opportunities for Reducing CO_2 Emissions from Conventional and Unconventional Fuels using Oxyfiring: a Life-Cycle Perspective, *American Flame Research Committee*, Annual Meeting, 2010, September 17-20, 2010.

A. Sarofim, P. Smith, R. Pugmire, **K. Kelly**, Near and Longer Term Solutions to Carbon Capture and Sequestration, *Pittsburgh Coal Conference*, September 20-23, 2009.

J. Zhang, **K. Kelly**, E. Eddings, J. Wendt, Effects of O_2 Partial Pressure on Flame Stability in Oxy-Coal Combustion, *Pittsburgh Coal Conference,* September 20-23, 2009.

J. Zhang, **K.E. Kelly**, E.G. Eddings, J.O.L. Wendt, Oxy-coal combustion: effects of PO_2 on coal jet stability in O_2/CO_2 environments, *1st Oxyfuel Combustion Conference*, September 8 -11, 2009, Cottbus, Germany.

J. Zhang, **K.E. Kelly**, E.G. Eddings, J.O.L. Wendt, Oxy-coal Combustion: Effects of PO_2 on coal jet stability in O_2/CO_2 Environments, *16th IFRF Members' Conference*, Boston, MA, June 8th -10th, 2009.

M. Gawlowski, **K. Kelly,** P. Sudhoff, I. Vela, A. Schönbucher (2008) Temperature Measurements Using Real-Time Holographic Interferometry in a Tank Fire – Influence of Species Composition, Poster presentation*, 32nd International Symposium on Combustion,* McGill University, Montreal, Canada, August 3-8 2008.

K.E. Kelly (2007) Institute for Clean & Secure Energy, *Virthuacon Conference*, Freiberg Germany, October 18-21, *invited talk*.

K.E. Kelly (2007) Highlights of Experimental and Simulation Studies of Pool Fires, Bundesanstalt für Materialforschung und –Prüfung, June 25, 2007, *invited talk*.

J.S. Lighty, **K.E. Kelly** (2007) Particulate Matter: Health Effects, Measurement Methods, and Recent Studies, American Association of Industrial Hygienists Annual Meeting, Salt Lake City Utah, September 28-30, 2007, *invited talk*.

K.E. Kelly, I.C. Jaramillo, D.A. Wagner, J.S. Lighty, M. Quintero, J. Villar, K. Collins (2006) Investigation of Low Wind/High Particulate Matter Episodes in the Imperial Valley/Mexicali Region, *Southwest Center For Environmental Research and Police Conference,* Tucson, AZ, December 1213, 2006.

K.E. Kelly, J.S. Lighty, R.T. Whitaker, J. Desha, D.M Weinstein (2006) Enhancement of Digital Methods for Determination of Opacity, *SERDP: Partners in Environmental Technology: Technical Symposium and Workshop*, Washington, DC, November 28 – 30, 2006.

K.E. Kelly, J.S. Lighty, (2006) Particulate Matter Studies at the University of Utah: Measurement Techniques and Recent Studies, Utah Industrial Hygiene Luncheon, Salt Lake City, UT, May 31, 2006, *invited talk*.

K.E. Kelly, J.S. Lighty, R.T. Whitaker, J. Desha, D.M Weinstein (2006) Improved Digital Methods, Strategic Environmental Research and Development/Environmental Science and Technology Certification Workshop on Particulate Matter and Opacity, Research Triangle Park, NC, February 22, 2006.

K.E. Kelly, I.C. Jaramillo, N. Arnold, D.A. Wagner, N. Shah, K. Wendell, M. Quintero, K. Collins, (2005) Particulate Matter Emissions from Agricultural Burns in the Imperial Valley, *Products of Incomplete Combustion Conference*, Tucson, AZ, June 15-18, 2005.

K.E. Kelly, I.C. Jaramillo, N. Arnold, D.A. Wagner, M. Quintero, K. Collins, (2005) The Effects of Agricultural Burning on Air Quality in the Imperial Valley, *Imperial Valley Air Quality Task Force Meeting*, Calexico, CA, March, 17, 2005.

K.E. Kelly, D.A. Wagner, J.S. Lighty, M. Quintero, K. Collins, A. Vazquez (2003) Vehicle Sources of Particulate Matter Emissions in the U.S.-Mexico Border Region, *Southwest Center for Environmental Research & Policy, Spring Conference*, Environmental Protection Agency, San Francisco, CA, April 1, 2003.

K.E. Kelly, D.A. Wagner, J.S. Lighty, M. Quintero, K. Collins, A. Vazquez (2003) Vehicle Sources of Particulate Matter Emissions in Calexico/Mexicali, *Imperial Valley Air Quality Task Force Meeting*, Calexico, CA, May, 13, 2004, *invited talk*.

K.E. Kelly, A.F. Sarofim, J.S. Lighty, D.A. Wagner, W.P. Arnott, C.F. Rogers, J. Sagebiel, B. Zielinska, G. Palmer, J. Schauer, K. Prather, D. Suess, M. Calidonna (2002) Characterization of Fine Particulate Matter from Military Sources with Real-Time Instruments. SERDP, Technical Symposium, December 3-5, Washington D.C.

K. E. Kelly, D. A. Wagner, A.F. Sarofim, J.S. Lighty, W.P. Arnott, E. Fujita, C.F. Rogers, J. Sagebiel, B. Zielinska, K.A. Prather, D.T. Suess, J. Schauer, G. Palmer (2001) Characterization of fine particulate emissions from vehicles using real-time instruments, 222nd ACS National Meeting -Chicago, IL August 26-30, Paper 122.

K.E. Kelly, D.A. Wagner, P. Kiang, A.F. Sarofim, J.S. Lighty, W.P. Arnott, E. Fujita, C.F. Rogers, J. Sagebiel, B. Zielinska, G. Palmer, M. Calidonna (2001) Using Real-Time Instruments to Characterize Fine Particles from a Variety of Combustion Sources. Seventh International Congress on Combustion By-Products, Research Triangle Park, NC June 4-6.

K. E. Kelly, D.A. Wagner, A.F. Sarofim, J.S. Lighty, W.P. Arnott, E. Fujita, C.F. Rogers, J. Sagebiel, B. Zielinska, K. A. Prather and D. T. Suess, J. Schauer, G. Palmer, M. Calidonna (2001)
Characterization of Particulate Matter from Aircraft Ground Support Equipment. Real World Clean Air Conference, San Diego, CA, April 23-25.

K. E. Kelly, J.G. Overly, M.L. Socolof, G.A. Davis (1998) Environmental Evaluation of Molding Exterior Body Panels in Color, SAE Transactions, Paper number 982121.

K. E. Kelly, G.A. Davis (1998) Comparison of Methods for Calculating Use-Stage Environmental Burdens for an Automobile, SAE Paper 982199.

MEDIA INTERVIEWS

KSL Evening News, February 3, 2021, Snowblowers and air quality.

KSL Noon News, February 3, 2021, What you can do about air quality.

Fox13 Place, January 22, 2021, Talking about the inversion and what we can do.

Nursing News, January 5, 2021, Center of excellence for exposure in health informatics exploring new health frontiers.

Deseret News, September 14, 2020. Turn off your car and save the planet.

KSL TV, September 2, 2020. Utah scientists receive grant to test real-time air pollution warning system.

KSL Radio, September 1, 2020. Pollution displays are coming to school drop-off zones.

KUED, July 3, 2020. Insight Panel Discussion: Air Quality, Utah, and COVID.

Deseret News, May, 20, 2020, Study: Minority students in Salt Lake County schools breathe dirtier air.

Catalyst Magazine, February 26, 2020, Citizen scientists take to the air.

Utah DEQ Blog. February 11, 2020. Is pollution from wood smoke going down? All your burning questions answered.

@TheU. February 10, 2020. Burning questions about air quality.

KSL Studio 5. February 6, 2020. What you can do to improve air quality.

KSL News. February 5, 2020. Woodburning and air quality trends.

Fox13 News. February 5, 2020. Woodburning restrictions improve air quality.

Fox13 News. January 20, 2020. The air is cleaner for those living at higher, more expensive elevations.

KCPW Radio. January 9, 2020. Community curiosity: how accurate are those low-cost sensors?

KSL Radio. December 6, 2019. What can we do about Utah's bad air?

US News & World Report. June 25, 2019 Utah faces unique air quality challenges.

KUER. June 15 ,2019 Landfill fire and potential health effects.

ABC4. May 9, 2019 The air we breathe in our own homes.

NSF Science Nation. March 19, 2019. Young citizen scientists assist in Salt Lake City air quality research

KUTV. December 7, 2018 Subsidies to reduce emissions may be part of plan for $100 million to improve Utah's air.

RadioActive. August 1, 2018. Air Quality Sensing and Women in Science.

Mother Jones. July 15, 2018. These New Air Sensors Could Revolutionize Air Pollution Regulation.

Wired.com. July 11, 2018. Cheap, Portable Sensors Are Democratizing Air-Quality Data.

National Public Radio, Central California. January 23, 2018. What's In Your Air? New Low-Cost Devices Monitor Valley Air Pollution.

Fox13 News. December 12, 2017. Bad air: what else can Utah and Utahns do?

KRCL. November 2, 2017. KRCL Radioactive. Air Quality and You.

KUER. October, 18, 2017. A Smog Museum With Lessons For Utah Today.

The Rod Arquette Show. KNRS 105.9 FM/570 AM. March 7, 2017. Air Board Requests Governor's Veto.

Salt Lake Tribune. March 6, 2017. Air Board seeks Utah Governor's Veto for First Time in a Decade.

KUER. February 14, 2017. Schools In Salt Lake Co. Will Help The U Monitor Air Pollution.

US News & World Report. February 12, 2017. Kids Get Hands-on Education in Air Quality.

Washington Times, Jackson Hole News and Guide, West Plains Daily Quill, Wyoming Eagle, The Daily Progress, . February 12, 2017. Students Get Education in Air Quality by Making Monitors.

Deseret News. February 8, 2017. East High Students Create Toy-Block Sensors to Detect Pollution.

Fox13 News. February 7, 2017. Students at East High School Got a Hands-on Education Today.

Utah Business. February 7, 2017. U Engineers Teach High School Students to Build Pollution Sensors from Toy Blocks.

KSL TV. February 7, 2017. East High Students Create Toy-Block Sensors to Detect Pollution.

KSL TV. January 17, 2017. Strategies to Understand and Improve our Air Quality.

KSL Radio. January 17, 2017. Collaborations Help us to Understand our Air Quality.

Powder Magazine. August 5, 2016. Salt Lake City Commits to Renewable Energy.

Fox13News. April 28, 2016. Students Develop Personal Air Monitoring System.

KSL News. April 28, 2016. CS Students Win Competition with Personal Air Sensor.

KUER News. January 14, 2016. New Pollution Network Adds Useful, New Data.

Salt Lake Tribune, Salt Lake City, UT, October 7, 2015. Utah environmentalists to bring DIY rules before air quality board.

Fox13News, Salt Lake City, UT, June 10, 2015. Pollution, hot temperatures create perfect conditions for ozone, DEQ says.

TribTalk. June 4, 2015. Utah's regional haze plan.

University of Utah Health Feed. February 24, 2015. Red lights are air pollution hot spots.

ABC4 News. January 26, 2015. What YOU can do about the inversion.

KSL News. January 26, 2015. Uneasy breathing: Leaders searching for air clearing solutions.

Fox13 News. January 17, 2015. Video game allows students to simulate air quality solutions in Utah.

University Utah Scope Radio. January 15, 2015. New game helps you understand how complicated Utah air quality issues really are.

University Utah Scope Radio. January 15, 2015. The challenges of making an educational game.

University of Utah Chronicle. January 15, 2015. Researchers unite to discuss inversion solutions.

PhysOrg. January 14, 2015. It's game on for air quality.

KSL. January 14, 2015. Video game app teaches teens about air pollution.

Deseret News. January 13, 2015. Uneasy breathing: Leaders searching for air clearing solutions.

KUER. January 12, 2015. Conversation on Air Pollution Heats Up.

Powder Magazine. December 2014. Smog lake city.

KUER. Salt Lake City, UT, December 4, 2014. Air quality board seeking public comment on wood burning ban.

Salt Lake Tribune. November 18, 2014. Trib Talk: Why wood smoke is bad for air quality.

KSL News. Salt Lake City, UT, July 4, 2014. Fireworks and air quality.

Chanel2News. Salt Lake City, UT, July 4, 2014. Fireworks and their impact on air.

KUED Contact. February 2, 2013. Air quality and the contributions of wood burning.

Chanel2News. Salt Lake City, UT, January 27, 2014. Winter inversions and what you can do.

KSL News. Salt Lake City, UT, January 22, 2014. Poor winter air quality and its sources.

KSL News. Salt Lake City, UT, January 21, 2014. Video game app teaches teens about air pollution.

Scope: University of Utah Health Sciences Radio, Salt Lake City, UT, January 10, 2014. Our Inversions, what Causes them and What Can We Do?

RadioWest, KUER, Salt Lake City, January 8, 2014. Models for Improving Utah's Air. http://radiowest.kuer.org/post/models-improving-utah-air

Fox13News, Salt Lake City, UT, December 30, 2013. Inversion…what creates it — how can we stop it?

Salt Lake Tribune, Salt Lake City, UT, December 22, 2013. Scientists tackle Utah's particulate puzzle.

KPCW, Park City, UT. Park City, UT, November 18, 2013. This Green Earth.

SERVICE

Masters and PhD Students
2020: MS advisor: Lys Draper (ChE, anticipated graduation Spring 2021)
2018-2019: MS advisor: Jesse Glisson (ChE, graduated) and Alicia Garff (MSTT, graduated)
2018-2020: PhD advisor: Shruti Hedge (expected graduation, spring 2021), Kamaljeet Kaur, (expected graduation, spring 2021) Tofigh Sayahi (graduated summer 2020), Reuben Attah, Zheyuan Pei

Theses committee member
Rete Browning (MS graduated), Hailee Dances (MS graduated), Tony Long (MS graduated), Ross Peterson (MS Atmospheric Sciences, graduated)
Robert Nelson (PhD graduated), John Fuertez (PhD graduated), Khalid Rashid (PhD graduated), Tom Becnel (PhD, ECE), Casey Mullen (PhD, Social and Behavioral Science), Yalda Saffary (PhD, ChE), Moataz Sheha (PhD, ChE), Dana Tran (PhD, Civil & Environmental Engineering)

Student projects

2020 UROP, Size-Selective Inlet for Low-Cost Particle Sensing, Connor Clay

2020 Air Quality and Sound Walls. Environmental Justice Course, Lucy Holland, Zach Miller

2019 Introduction to Civic Leadership in Partnership with the Bennion Center: Chelsea Li, Ayana Amaechi, Daryl High

2018 ChE Senior Project: Team AirWolf: Drone-Based, Air Quality Measurements. ChE Senior Design Project, McKenna Buck, Nicole Burnette, Cassie Roberts

2017 ECE Clinic Project: Developing a potentiostat for integration into low-cost environmental sensing, Kyle Tingey, Riley Creps

2016 ECE Signal Processing Class Project: Jonathan Davis Driggs, Pooja Mehta, Spencer Shiveley

2016 GCSC Class Project: Emerson Ehrhart, Kevin Craft, Jory Lehrback

2016 ChE Air Pollution Control: Aethalometer and wood-burning, Inversions and particle size distributions, Developing an aerosol chamber for low-cost PM sensors, and Identifying sources of air toxics in the Bountiful area.

2016 ChE Senior Project: Identifying sources of dichloromethane and formaldehyde in the Bountiful region, Developing and evaluating low-cost sensor housing.

Honors Theses: Alex Motro, Eziekel Peterson

Guest Lectures

March 19, 2019, Internal Service, ENVST 3365, Environmental Justice

September 2018, 2019, 2020 Internal Service, BIOL 3460, Global Environmental Issues

November 3, 2017, Internal Service, Seminar occupational and environmental health.

Internal Service

Graduate Committee 2019 - present

WChE Faculty Advisor, 2017 - present

Chemical Engineering, Faculty search committee, 2016, 2018/2019/2020

Pharmacology/toxicology, Faculty search committee, 2018/2019

University of Utah Air Quality Task Force, 2015 - 2016

Advisor, Student Chapter of Air & Waste Management Association, 2013 – 2017
Chemical Engineering, Innovation lab, 2017

Instructor, HiGear Camp to encourage high-school women interested in Chemical Engineering, 2016 - 2019

External Service

Guest Editor, *Journal of Aerosol Science*, Low-Cost Sensing Special Issue, 2019 – present.

Division Director and Area Chair, AIChE Environmental Division

Governor's Air Quality Advisory Board 2017 – present.

Co-Organizer, Air Quality, Science for Solutions, Utah 2017 – present.

AAAR Newsletter Editor, 2019 – present..

Vice Chair, Utah State Air Quality Board 2009 – 2017.

AAAR Health Related Aerosols Working Group, 2017 – 2019.

Session Chair, Nanoparticles and Health, AIChE, 2016, 2017.

Session Chair, Particulate Matter and Health, AAAR, 2017, 2018.

Air & Waste Management Association, Great Basin Chapter Advisory Board, 2007 – 2011.

Utah DEQ Clean Utah Partners Advisory Board, 2008 – 2016.

Utah DEQ Carbon Capture Advisory Committee, 2008 – 2014.

AWARDS

- 2019 Top Undergraduate Teachers, College of Engineering Fall 2019
- AIChE Environmental Division, Early Career Award
- Bennion Center's Pitch In, Grand Prize Winner
- William H. Corcoran Award for the best paper in Chemical Engineering Education in 2018 (awarded 2019)
- UCAIR Air Quality Person of the Year 2018

TEACHING

- ChE 2300 Thermodynamics I, 2017 – 2019
- ChE 4705 Chemical Engineering Project, 2018
- ChE 6158 Energy and Society, 2015 - 2017

INVENTION DISCLOSURES

- Kelly, K.; Sayahi, T.; Kaufman, D. Invention Disclosure: calibration chamber for validating low-cost chambers; 2019.
- Gaillardon, P.; Kelly, K.; Tingey, K.; Whitaker, J. Invention Disclosure: low-cost, air quality sensor and housing; 2017.
- Kelly, K.; Sayahi, T.; Garff, A.; Le, K.; Butterfield, A.; Becnel, T.; Gaillardon, P. E. Invention Disclosure: machine learning approach to ozone detection with an ultra low cost metal oxide sensor; 2020.
- Gaillardon P, T. Becnel, System for Recursive Calibration of a Sensor Network, -6859 Non-Provisional patent

FUNDING

NSF Awarded (7/2020 – 6/2025)
CAREER: Community-Engaged, Sensor Network for Identifying Air Pollution Sources
Formaldehyde is a human carcinogen, and each year more than 25 million Americans are exposed to formaldehyde levels that exceed the Environmental Protection Agency (EPA)'s cancer risk threshold. Formaldehyde levels are an urgent problem in northern Utah because formaldehyde emission sources are unknown, yet local ambient levels are, on average, 50 times greater than EPA's cancer risk threshold. Environmental regulators have been unable to identify regional formaldehyde source(s) because the expense of the measurements limits data collection over space and time, making it nearly impossible to identify the pollution source(s). This project will develop and apply newly developed nanofiber sensor arrays, together with advanced analytical techniques, in a community-based network to identify the source(s) of formaldehyde. The results of this project will also offer unprecedented opportunities nationwide for communities, policy makers, and researchers to identify and address pollutant sources. This project will also develop a rich framework for attracting and retaining engineering students, particularly those from under-represented populations through the development and delivery of engaging, place-based educational activities. Role: PI, Funding: $500,000.

NIH NIEHS 2R01ES017431-08A1 (8/2019 – 7/2022)
TRP Channels and Air Pollution
This project aims to understand the role of air pollution and TRP ion channels in asthma exacerbations. This will entail developing precise estimates of particle pollution in the study region: Role: co-investigator, Funding: $120,000 (Kelly portion)

NIH NIEHS 59203601 (10/2016 – 12/2021)
Linking Combustion-Derived Particle Physicochemical Properties to Pathologically Important Responses in Lung Cells
This project's objective is to complete an integrated research and career development plan to transition the PI to an independent investigator. The research objective will lead to improved metrics for linking particulate matter (PM) properties to health outcomes and for developing exposure-mitigation strategies tailored to the most potent characteristics of PM. The project focuses on combustion PM and seeks to answer how combustion PM's size, shape, and composition modify biological processes that may be pivotal in linking air pollution to commonly observed adverse outcomes in respiratory tissue. Role: PI, Funding: $775,000

NSF 1642513 (10/2016 – 9/2020)
AirU: Community Network to Understand Air Quality and Sensor Reliability
This project builds on the principal investigators' existing community partnerships, K-12 outreach program, and their network platform for low-cost air quality sensors (AirU) to engage and empower their community in understanding and addressing their city's most pressing air-quality research questions and to evaluate sensor reliability. The air-quality data network will continually report online air-quality parameters, including PM, NO2, and CO, and will educate the public about project progress and more broadly about local air quality with regular updates and opportunities for feedback.
Role: PI, Funding: $100,000

NSF 646408 (10/2016 – 9/2020)
A Layered Framework of Sensors, Models, Land-Use Information and Citizens for Understanding Air
Quality in Urban Environments
This project aims to develop the next generation low-cost $PM_{2.5}$ sensor network that integrates with existing infrastructure and leverages citizen scientists to host sensors. It will also build a computational model that combines multi-layer sensor measurements with information about weather, topography, and land use patterns to produce block and minute level estimates of $PM_{2.5}$ levels. Finally, it will develop a visualization interface that supports sense-making of the model output, the associated uncertainty, and personalized informatics related to an individual's estimated $PM_{2.5}$ exposure. Role: coPI, Funding $780,000

NIH 1U54EB021973 (01/2016 – 09/2019)
National Institutes of Health
Prisms Informatics Platform - Federated Integration Architecture
This project is building an information system that will help researchers better understand the impact of environmental exposures on asthma and other diseases. It is investigating how environmental and personal metric information can be collected from different types of wearable and stationary sensors. The sensor information is being combined with health, community, and environmental information and presented in a way that is meaningful.
Role: Investigator, Funding $5,000,000

Local Foundations (01/2014 – 12/20)
Educational Research Development Council, Rocky Mountain Power Foundation, Michael Foundation,
Lawrence T. and Janet T. Dee Foundation
Low-cost, air quality sensors
These project develop low-cost air quality to detect ozone, NO_2, particulate matter, temperature, and humidity with have integrated wireless communication. This project addresses the poor spatial and temporal distribution of air quality data, and it includes support for working with local schools.
Role: PI, Funding: $50,000

Utah Division of Air Quality (01/2015 – 12/2020)
Understanding the geospatial distribution of air toxics
Several projects to address gaps in the understanding of local and regional air-quality issues. These include elevated levels of air toxics, wood-burning contributions to particulate matter, and sources of ammonia. Role: PI/coPI, Funding: $200,000

Pacificorp (06/2017 – 12/2021)
Biomass co-firing
This project addresses the life-cycle environmental impacts of co-firing Utah-sourced biomass with coal for electricity generation. Role: coPI, Funding: $36,000