

CURRICULUM VITAE

Indrek Külaots

Senior Lecturer in Engineering, Brown University

EDUCATION

Ph.D. in Chemical Engineering, Brown University, Providence, RI, 2001

Sc.M. in Applied Mathematics, Brown University, Providence, RI, 2000

Sc.M. in Mechanical Engineering, Tallinn Technical University, Tallinn, Estonia, 1995

B.S. in Mechanical Engineering, Tallinn Technical University, Tallinn, Estonia, 1993

PROFESSIONAL APPOINTMENTS

Distinguished Senior Lecturer in Engineering, Brown University, RI, 2022 - present

Senior Lecturer in Engineering, Brown University, Providence, RI, 2017 - 2022

Lecturer in Engineering, Brown University, Providence, RI, 2012 - 2017

Lecturer and Senior Research Engineer, Brown University, Providence, RI, 2009 – 2012

Senior Research Engineer, Brown University, Providence, RI, 2001 – 2009

Senior Visiting Lecturer, Suffolk University, MA, 2008 – 2012

Lecturer, Tallinn University of Technology, Tallinn, Estonia, 1995 – 1997

PATENTS AND AWARDS

Dean's Award for Excellence in Teaching in Engineering, Harriet W. Sheridan Center for Teaching and Learning, May 2022.

Patent application, 'Graphene-based nanosheet film use as passive air sampler for top EPA list air contaminants', submitted November 2021.

State of RI Research Alliance Grant, 'Novel graphene-based nanosheet film as PFAS air passive sampler to access contamination sources in Narraganset Bay, Co-PI in a \$80,000 grant proposal, submitted in October 2021.

Junior level Lecturer Advising Award, by DOF, \$1000, 2021.

Advanced Fuel Research, \$2000 gift award to support research in novel high-surface area materials, 2020.

Semma Therapeutics (formerly CytoSolv) gift award to support research with polymers, \$4960, 2019.

Junior level Lecturer Advising Award, by DOF, \$1000, 2018.

Dedicated Faculty Award for superior teaching, dedication and involvement both in and out of the classroom, The Rhode Island Alpha Chapter of Tau Beta Pi Class of 2015 and School of Engineering, Brown University, May 2015.

Excellence in Review Award for service to Elsevier journal *Carbon* in 2013/2014, March 2015.

Lighting apparatus for capturing and stabilizing mercury, US patent 8,869,992, 2014.

Cabot Corporation, \$10,000 gift award to support research in safe handling and processing of graphite oxide, 2014.

Advanced Fuel Research, \$4,800 gift award to support research with bio-chars, 2013.

US Provisional 61511452 Patent: Külaots, I., Trinh, W., Cooper, N. “Biomass conversion for mercury capture and particulate matter control.” filed 2011.

US Patent US20110048982 A1: Hurt, R.H., Sarin, L., Külaots, I., Hamburg, S. “Nano-structured sorbent materials for capturing environmental mercury vapor.” March 3, 2011.

DOE and EPRI funded “Scale-Up and Demonstration of Fly Ash Ozonation technology” R&D project in Montour, PA, with total budget: \$914,000, 2005.

Research commissioned by Estonian Energy AS. “Examination of the beneficial use options for Estonian oil shale fluidized bed combustion ash.” 1/1/2009-5/30/2009; Co-PI, 2009.

First place Estonian Academy of Science Award for Master Thesis (out of 94 qualified research papers), 1995.

PEER-REFEREED ARCHIVAL PUBLICATIONS (reverse chronological order)

37. H. Lees, I. Külaots, E. Suuberg. “Oil Shale Kerogen-Derived Adsorbents and their Application to Trichloroethylene Adsorption from Aqueous Solutions” Microporous and Mesoporous Materials, under review, submitted on 1/9/2023.

36. K. E. Manz, I. Külaots, C.A. Greenley, P. Landry, K.V. Lakshmi, M. Woodcock, L. Hellerich, D. Bryant, M. Apfelbaum, K. D. Pennell. “Low-temperature persulfate activation by powdered activated carbon for simultaneous destruction of perfluorinated carboxylic acids and 1,4-dioxane,” *Journal of Hazardous Materials*, 442, 1/2023.

35. Kwon, Y.,* Liu, M, Castilho, C., Saleeba, Z., Hurt, R and Külaots, I. “Controlling pore structure and conductivity in graphene nanosheet films through partial thermal exfoliation” *Carbon*, 174, 227-239, 2021.

34. Xiao, Z., Zhang, Q., Guo, X., Jake, V., Hu, Y, Kulaots, I., Garcia-Rojas,D., Guo, W and Colvin, V. “Libraries of Uniform Magnetic Multicore Nanoparticles with Tunable Dimensions for Biomedical and Photonic Applications”, *ACS Applied Materials & Interfaces*, 12, 41932-41941, 2020

* An undergraduate student during research

33. Flores-Chaparro, C.E., Castilho, C.J., Külaots, I., Hurt, R. and Rangel-Mendez, J.R. "Pillared graphene oxide composite as an adsorbent of soluble hydrocarbons in water: pH and organic matter effects" *Journal of Environmental Management*, Vol. 259, 2020.
32. Culin, C.,* Tente, K., Konist, A., Maaten, B., Loo, L and Kulaots, I. "Reactivities of American, Chinese and Estonian oil shale semi-cokes and Argonne premium coal chars under oxy-fuel combustion conditions " *Oil Shale*, 26(3), 353-369, 2019.
31. Qiu, Y., Moore, S.,* Hurt, H. R., and Kulaots, I. "Influence of external heating rate on the structure and porosity of thermally exfoliated graphite oxide" *Carbon*, Vol.111: 651-657, 2017.
30. Maaten, B., Loo, L., Konist, A., Nesumajev, D., Pihu, T., and Külaots, I. "Decomposition kinetics of American, Chinese and Estonian oil shale kerogen" *Oil Shale*, Vol. 33:2, 167-183, 2016.
29. Qiu, Y., Felten, C.,* Hurt, H. R., and Kulaots, I. "Thermochemistry and kinetics of graphite oxide exothermic decomposition for safety in large-scale storage and processing" *Carbon*, Vol. 96: 20-28, 2016.
28. Qiu, Y., Wang, Z., Owens, A., Kulaots, I., Chen, Y., Kane, A., and Hurt, R. "Antioxidant Chemistry of Graphene-Based Materials and its Role in Oxidation Protection Technology" *Nanoscale*, Vol.6: 11744-11755, 2014
27. Qiu, Y., Guo, F., Hurt, R. and Külaots, I. "Explosive thermal reduction of graphene oxide-based materials: Mechanism and safety implications" *Carbon*, Vol. 72: 215-223, 2014
26. Han, X., Kulaots, I., Jiang, X. and Suuberg, E. "Review of oil shale semicoke and its combustion utilization" *Fuel*, Vol. 126: 143-161, 2014
25. Guo, F., Creighton, M., Chen, Y., Hurt, R. and Külaots, I. "Porous structures in stacked, crumpled and pillared graphene-based 3D materials" *Carbon*, Vol. 66: 476-484, 2014
24. Chen, Y., Guo, F., Qiu, Y., Hu, H., Külaots, I., Walsh, E. and Hurt, R. "Encapsulation of particle ensembles in graphene nanosacks as a new route to multifunctional materials" *ACS Nano*, Vol. 7 (5): 3744-3753, 2013
23. Goldfarb, J., D'Amico, A., Culin, C.,* Suuberg, E.M. and Külaots, I. "Oxidation kinetics of oil shale semicokes: reactivity as a function of pyrolysis temperature and shale origin" *Energy&Fuels*, Vol. 27 (2): 666-672, 2013

* An undergraduate student during research

22. Chen, Y., Guo, F., Jachak, A., Kim, S., Datta, D., Liu, J., Külaots, I., Vaslet, C., Jang, H., Huang, J., Kane, A., Sheoney, V. and Hurt, R. "Aerosol synthesis of cargo-filled graphene nanosacks" *Nano Letters*. 12(4):1996-2002, 2012
21. Liu, X, Sen, S., Liu, J., Kulaots, I., Geohegan, D., Kane, A., Poretzky, A., Rouleau, C., More, K., Palmore, T. and Hurt, R. "Antioxidant Deactivation on Graphenic Nanocarbon Surfaces" *Small*. Vol. 7(19): 2775-2785, 2011
20. Han, S., Ma, Z., Wei, Y., Kravtsov, V., Luisi, B., Kulaots, I, Moulton, B. "A single-crystalline microporous coordination polymer with mixed parallel and diagonal interpenetrating alpha-Po networks" *CrystEngComm* Vol. 13(15): 4838-4840, 2011
19. Link, S., Arvelakis, S., Hupa, M., Yrjas, P., Külaots, I. and Paist, A. "Reactivity of the Biomass Chars Originating from Reed, Douglas Fir and Pine." *Energy Fuels*. Vol. 24(12): 6533-6539, 2010
18. Külaots, I., Goldfarb, J.L. and Suuberg, E.M "Characterization of Chinese, American and Estonian Oil Shale Semicokes and their sorptive potential." *Fuel*. Vol. 89(11): 3300-3306, 2010
17. Goldfarb, J. and Külaots, I. "Melting points of Enthalpies of Fusion of Anthracene and heteroatomic counterparts." *Journal of Thermal Analysis and Calorimetry*. Vol. 102: 1063-1070, 2010
16. Johnson, N.C., Manchester, S., Sarin, L, Gao, Y., Külaots, I. and Hurt, R.H. "Mercury Vapor Release from Broken Fluorescent Lamps and in Situ Capture by New Nanomaterial Sorbents." *Environmental Science & Technology*. Vol. 42(15): 5772-5778, 2008
15. Manchester, S., Wang, X., Külaots, I., Gao, Y. and Hurt, R.H. "High Capacity Mercury Adsorption on Freshly Ozone Treated Carbon Surfaces." *Carbon*. Vol. 46(3): 518-524, 2008
14. Külaots, I., Hsu, A. and Suuberg, E.M. "The Role of Porosity in Char Combustion." *Proceedings of the Combustion Institute*. Vol. 31(2): 1897-1903, 2007
13. Külaots, I., Min, K.J., Flatt, T. and Tatar, M. "Counting calories in Drosophila diet restriction." *Experimental Gerontology*. Vol. 42: 247-251, 2007
12. Jian, K., Yan, A., Külaots, I., Crawford, G.P. and Hurt, R.H. "Reconstruction and Hydrophobicity of Nanocarbon Surfaces Composed Solely of Graphene edges". *Carbon*. Vol. 44(10): 2102-2106, 2006
11. Yan, A., Külaots, I., Yang, N.Y.C. and Hurt, R. "Biocompatible, Hydrophilic, Supermolecular Carbon Nanoparticles for Cell Delivery." *Advanced Materials*. Vol. 18: 2373-2378, 2006
10. Yan, A., Külaots, I., Xiao, X., Sheldon, B. and Hurt, R.H. "Controlling Water Contact Angle on Carbon Surfaces from 5° to 167°." *Carbon*. Vol. 44: 3113-3148, 2006

9. Külaots, I., Hurt, R.H. and Suuberg, E.M. "Size Distribution of unburned carbon in coal fly ash and its implications." *Fuel*. Vol. 83(2): 223-230, 2004
8. Chen, X., Farber, M., Gao, Y., Külaots, I. Suuberg, E.M. and Hurt, R.H. "Mechanisms of surfactant adsorption on non-polar, air-oxidized and ozone-treated carbon surfaces." *Carbon*. Vol. 41(8): 1489-1500, 2003
7. Külaots, I., Hsu, A., Hurt, R.H. and Suuberg, E.M. "Adsorption of Surfactants on Unburned Carbon in Fly Ash and Development of a Standardized Foam Index Test." *Cement and Concrete Research*. Vol. 33(12): 2091-2099, 2003
6. Yang, N.Y.C, Jian, K, Külaots, I., Crawford, G.P. and Hurt, R.H. "Template synthesis of a porous nanophase mesocarbon". *Journal of Nanoscience and Nanotechnology*. Vol. 3: (5): 386-391, 2003
5. Gao, Y., Külaots, I., Chen, X., Suuberg, E.M. and Hurt, R.H. "The Effect of Solid Fuel Type and Combustion Conditions on Residual Carbon Properties and Fly Ash Quality." *Proceedings of the Combustion Institute*. Vol. 29(1): 475-483, 2002
4. Külaots, I., Aarna, I., Callejo, M., Hurt, R.H. and Suuberg, E.M. "Development of Porosity During Coal Char Combustion." *Proceedings of the Combustion Institute*. Vol. 29(1): 495-501, 2002
3. Gao, Y., Külaots, I., Chen, X., Aggarwal, R., Mehta, A., Suuberg, E.M. and Hurt, R.H. "Ozonation for the Chemical Modification of Carbon Surfaces in Fly Ash." *Fuel*, Vol. 80(5): 765-768, 2001
2. Yu, J., Külaots, I., Sabanegh, N., Gao, Y., Hurt, R.H., Suuberg, E.M. and Mehta, A.. "Adsorptive and Optical Properties of Fly Ash from Coal and Petroleum Coke Co-Firing." *Energy Fuels*. Vol. 14(3): 591-596, 2000
1. Külaots, I., Ots, A., Yrjas, P., Hupa, M. and Backman, P. "Sulphation of Estonian and Israeli Oil Shale Ashes under Atmospheric and Pressurized Combustion Conditions." *Oil Shale*. Vol.14(3): 265-283, 1997

NON-REFEREED ARCHIVAL PUBLICATIONS

3. Külaots, I. "Structure, properties, and surfactant adsorption behavior of fly ash carbon." *Ph.D thesis, Brown University Print*, Providence, RI, 2001
2. Külaots, I. "Põlevkivi mineraalosa käitumine ülerõhul koldes." Master of Science Thesis (in Estonian), *Tallinn Technical University Print*, Tallinn, Estonia, 1995
1. Külaots, I., P. Yrjas, M. Hupa and A. Ots. "Sulphation of oil shale ash under atmospheric and pressurized combustion conditions." *Åbo Akademi Print*, Report 94-18B:40, 1994

INVITED LECTURES

6. Külaots, I., “Controlling pore structure in graphene nanosheet films” Sustainable Energy Materials Department, Imperial College, London, UK, August 20th, 2019.
5. Külaots, I., “Porous structures in graphene-based materials.” School of Engineering and Materials Science, Queen Mary University, London, UK, June 2nd, 2017.
4. Külaots, I., “Porous structures in graphene-based materials.” Quantachrome Instruments, Boynton Beach, Florida, USA, January 16th, 2015
3. Külaots, I. “Structure, properties of various carbon origin materials and their application” presented at American University of Beirut, *AUB*, Lebanon, February 20th, 2012
2. Xinyuan, L., Külaots, I., Kane, A.B. and Hurt, R.H. “Progress in the design of Carbon nanotubes for environmental health and safety.” Invited lecture, *International Carbon 2009 Conference*, Biarritz, France, June, 2009
1. Külaots, I., Johnson, N.C, Manchester, S., Gao, Y. and Hurt, R.H. “Chemically modified Carbons for high-performance Mercury vapor capture.” Invited lecture, *International Carbon 2008 Conference*. Nagano, Japan, July, 2008

CONFERENCE PROCEEDINGS

36. A. Weiss, M. Lopez, R. Hurt and I. Külaots, “Graphene-based nanosheet films as passive air samplers for detecting Volatile Organic Compounds in indoor air”. *World Conference of Carbon*, London, UK, July, 2022.
35. I. Külaots, “Biomass (waste or dirt) to high-end materials for environmental clean up situations, Vartan Gregorian Elementary School Science Conference, June 8th, 2022.
34. K. E. Manz, C.A. Greenley, I. Külaots, L. Hellerich, D. Bryant, M. Apfelbaum, K. D. Pennell, ”Powder activated carbon promotes persulfate activation to degrade PFOA and 1,4-dioxane at room temperature” ACS Fall 2021 National Meeting & Exposition (Atlanta, GA), August 2021.
33. Kwon, Y., Berhane, S., DeCastilho, C., Hurt, R, and Külaots, I. “Optimizing Conditions for Thermal Exfoliation of Graphene oxide films”2019 AIChE fall meeting, 2019.
32. Kwon, Y., Berhane, S., DeCastilho, C., Liu, M., Hurt, R, and Külaots, I. ”Optimal conditions for large-scale generation of graphene-based materials through thermal exfoliation of graphite oxide films”, *World Conference of Carbon*, Lexington, KY, July, 2019.

31. DeCastilho, C., Berhane, S., Hurt, R. and Kulaots, I., "Thermal exfoliation of graphite oxide films - thermal hazard or an opportunity for large-surface-area graphene-based materials" *World Conference of Carbon*, Madrid, Spain, July, 2018.
30. Kulaots, I., Moore, S., Qiu, Y. and Hurt, R. "The effect of external heating rate in graphite oxide thermal exfoliation" *World Conference of Carbon*, Melbourne, Australia, July 28th, 2017.
29. Kulaots, I., Moore, S., Qiu, Y. and Hurt, R. "Graphite oxide explosive thermal exfoliation – thermal hazard or opportunity for large-surface-area graphene-based materials" *International Carbon 2016 conference*, Pennsylvania State University, U.S.A, extended abstract S10, O14-1, April, 2016
28. Kulaots, I., Qiu, Y., Felten, C. and Hurt, R. "Explosive and non-explosive modes of graphite oxide thermal exfoliation and its safety implications" *International Carbon 2015 conference*, Dresden, Germany, extended abstract NC8, March, 2015
27. Kulaots, I., Qiu, Y. and Hurt, R. "Explosive thermal exfoliation of graphene oxide based materials and its implication to surface area development" *International Carbon 2014 conference*, Jeju, Korea, extended abstract S6-181, March, 2014
26. Kulaots, I., Qiu, Y., Guo, F. and Hurt, R. "Self-initiated thermal exfoliation of graphene oxide films" *International Carbon 2013 conference*, Rio de Janeiro, Brazil, extended abstract #748, April, 2013
25. Kulaots, I., Guo, F., Creighton, M., Chen, Y. and Hurt, R. "Porous structures in 3D Graphene based materials" *International Carbon 2012 conference*, Krakow Poland, extended abstract #602, April, 2012
24. Kulaots, I., N. Cooper, W. Trinh, S. Link, S. Arvelakis and E.M. Suuberg. "Wide network of porosity available in wheat straw and olive residue chars." *ACS Fuel Division Preprints*, extended abstract #22697, March, 2012
23. Kulaots, I., N. Cooper, S. Link, S. Arvelakis and E.M. Suuberg. "Micro- and mesopore networks in olive residue and wheat straw chars." *International Carbon 2011 conference*, Shanghai China, extended abstract #189, April, 2011
22. Cooper, N., S. Link, S. Arvelakis E.M. Suuberg and I. Kulaots. "Characterization of bio-chars obtained from various biomaterials." *ACS Fuel Division Preprints*, extended abstract #22489, March, 2011
21. Goldfarb, J.L., B. Datangel and I. Kulaots. "Oil shale semi-coke as a carbon source: sorbent capacity, reactivity and entrained compounds as a function of pyrolysis temperature and shale origin." *ACS Division of Environmental Chemistry Preprints*, extended abstract #11480, August, 2010

20. Külaots, I., S. Link, S. Arvelakis and E.M. Suuberg. "Adsorption properties of Wheat straw, Reed and Douglas Fir chars." *International Carbon 2010 conference*, extended abstract #147, Clemson, SC, July, 2010
19. Liu, X., S. Sen, I. Külaots, D. Geohegan, A. Poretzky, T. Palmore, A. Kane and R.H. Hurt. "Nanotoxicology: Depletion and antioxidants by heterogeneous catalysis on carbon surfaces." *International Carbon 2010 conference*, extended abstract #378, Clemson, SC, July, 2010
18. Guo, F., I. Külaots and R.H. Hurt. "Etching of complex nanopores in crystallographic directions by cobalt-catalyzed carbon hydrogenation." *International Carbon 2010 conference*, short abstract #386 (Poster Presentation), Clemson, SC, July, 2010
17. Goldfarb, J., I. Külaots and Eric Suuberg. "Characterization, kinetics and potential utilization of oil shale semicoke." *ACS Fuel Division Preprints (Heavy Hydrocarbon Symposium)* August, 2009
16. Link, S., S. Arvelakis, A. Paist, M. Hupa, P. Yrjas, I. Külaots. "Effect of leaching pre-treatment on char reactivity of pyrolyzed wheat straw." *17th European Biomass conference*, Hamburg, Germany, July, 2009
15. Külaots, I., J.L. Goldfarb and E.M. Suuberg. "The characteristics of oil shale semicoke organic char." (Poster Presentation) *International Oil Shale Symposium*, Tallinn, Estonia, June, 2009
14. Külaots, I., J. Goldfarb, E.M. Suuberg. "Properties and potential applications of carbon byproduct from oil shale semicokes." *International Carbon 2009 conference*, extended abstract #462, Biarritz, France, June, 2009
13. Liu, X., I. Kulaots, A. Kane and R. Hurt. "On the materials origin of carbon nanotube toxicity: interactions with the physiological antioxidant glutathione." ACS 237th National meeting, Salt Lake City, UT, March, 2009
12. Luisi, B., S. Han, V.Ch. Kravtsov, I. Külaots and B. Molton, "Porosity in maximally interpenetrated coordination polymers, *11th International Seminar on Inclusion Compounds (ISIC-11)*, Kyiv, Ukraine, June, 2007
11. Hurt H.R., S. Manchester, Y. Gao, I. Külaots, L. Sarin, and A. Yan. "Novel nanostructured sorbents for mercury capture." *ACS 234th National Meeting*, Boston, MA, 47(2) pp 995-1000, 2007
10. Manchester, S., I. Külaots, X. Wang, Y. Gao, A. Yan, R. Hurt. "High Efficiency Vapor Phase Mercury Capture by Carbon Surface Functionalization with Ozone." *International Carbon 2007 conference*, Poster Presentation, Seattle, July, 2007

9. Külaots, I., A. Yan, K. Jian and R. Hurt. "Hydrophilicity control and characterization of carbon nanomaterials." *International Carbon 2006 conference*, short abstract #SA-53, Aberdeen, Scotland, July, 2006
8. Külaots, I., E.M. Suuberg, I. Aarna, E. Chan and A. Xu. "Pore development in a softening coal char during activation in various oxidizing gases." *International Carbon 2004 conference*, short abstract #28.2, Providence, RI, July, 2004
7. Chen, X., Y. Gao, I. Külaots, E.M. Suuberg, E., and R.H. Hurt. "Fly ash beneficiation with ozone: Mechanism of adsorption suppression." *ACS 224th National meeting*, Boston, MA, August, 2002
6. Külaots, I., R.H. Hurt, E.M and Suuberg, "Size distribution of unburned carbon in coal fly ash and its role in foam index." *ACS 224th National meeting*, Boston, MA, August, 2002
5. Chen, X., Y. Gao, I. Külaots, A. Mehta, E.M. Suuberg, and R.H. Hurt. "Ozone treatment of unburned carbon surfaces in fly ash." *Proc.-annual intern. 18th Pittsburgh coal conference*. Preprints: 2920-2923, 2001
4. Külaots, I., Y. Gao, R.H. Hurt and E.M. Suuberg. "Adsorption of ammonia on coal fly ash." *4th International Ash Utilization Symposium*. Preprints: 108-117, Lexington, KY, October, 2001
3. Chen, X., Y. Gao, I. Külaots, E.M. Suuberg and R.H. Hurt. "Ozonation for the chemical modification of carbon surfaces in fly ash." *International Carbon 2001 conference*, Preprints: 791-792. University of Kentucky, Lexington, KY, July 2001
2. Külaots, I., Y.M. Gao, R.H. Hurt, and E.M. Suuberg. "The Role of the Polar Surface and Mesoporosity in Adsorption of Organics by Fly Ash Carbons." *ACS 216th National meeting*. Boston MA, August, 1998
1. Yrjas, P., I. Külaots, M. Hupa, and A. Ots. "Sulphur capture by Oil Shale Ashes under Atmospheric and Pressurized FBC conditions." *13th international FBC Conference*, ASME Publication. Vol. 2: 1035-1041, Orlando, FL, 1995

REVIEWER FOR PEER-REVIEWED JOURNALS

- *In my career I've been invited to review papers in 24 peer-reviewed scientific journals.*
- Carbon – steady reviewer*
- Thermochimica Acta – steady reviewer*
- I&ECR – steady reviewer*
- Chem Engineering Communications – occasional reviewer*
- ACS Omega - occasional reviewer*
- AIChE Journal - occasional reviewer*
- ACS Journal - occasional reviewer*
- Oil Shale – steady reviewer*
- Fuel Process Technology - occasional reviewer*
- The Journal of Physical Chemistry – steady reviewer*
- And many other journals*

CURRENT RESEARCH ADVISING

Postdoctoral Advising

- Dr. Heidi Lees, Department of Energy Technology, Tallinn University of Technology, 2021 - present

Master's student Advising

- Abigail Weiss, School of Engineering, Brown University, MS degree 2022
- Manuel Lopez, School of Engineering, Brown University, MS degree 2023

Undergraduate Advising

- Manuel Lopez, School of Engineering, Brown University, CE Class 2022

PREVIOUS RESEARCH ADVISING

Postdoctoral Advising

- Dr. Alar Konist, Department of Thermal Engineering, Tallinn University of Technology, September 2014 until present.

Doctoral student advising

- PhD Candidate Birgit Maaten, Department of Thermal Engineering, Tallinn University of Technology, January 2015 until present.

Graduate Research Advising

- Yongbeom (Eric) Kwon, School of Engineering, Brown University, MS degree 2021 (currently PhD student at Columbia University)
- Alar Konist, Department of Thermal Engineering, Tallinn University of Technology, PhD, 2013.

Undergraduate Research Advising

- Yongbeom (Eric) Kwon, School of Engineering, Brown University, Class 2020
- Sara Berhane, School of Engineering, Brown University, Class 2019
- Dennese Salazar, School of Engineering, Brown University, Class 2019
- Stephen Bourguet, School of Engineering, Brown University, Class 2017
- Samuel Moore, School of Engineering, Brown University, Class 2016
 - Sam won first place in national AIChE student poster competition
- Collin Felten, School of Engineering, Brown University, Class 2015
- Hunter Tabloff, Center of Environmental Studies, Brown University, Class 2015
- Omar Nema, School of Engineering, Brown University, Class 2015
- Kevin Tente, Providence College, Class 2015
- Christopher Culin, School of Engineering, Brown University, Class 2014
- Alec Zisson, School of Engineering, Brown University, Class 2016
- Nathaniel Cooper, School of Engineering, Brown University, Class 2012

- Nathaniel won twice second place in national AIChE student poster competition
- William Trinh, School of Engineering, Brown University, Class 2012

STAFF SUPERVISION

Brown University, School of Engineering, Providence, RI
 Technical Assistant Supervision, 2012 – present

- Zachary Saleeba, Research Engineer, Chemical and Biochemical Engineering and Environmental Engineering Labs
- Benjamin Lyons, Senior Technical Assistant, Mechanical Engineering Labs
- John Shilko, Senior Technical Assistant, Materials Engineering Labs
- George Worth, Senior Technical Assistant, Electrical Engineering Labs
- Gerald Zani, Senior Technical Assistant, Mechanical and Materials Engineering Labs

TEACHING EXPERIENCE

Brown University, School of Engineering, Providence, RI
 Lecturer in Engineering and Senior Lecturer in Engineering, 2012 – present

Blackboard courses:

- Heat and Mass Transfer
- Fundamentals of Environmental Engineering
- Energy and the Environment
- Water Supply and Treatment Systems - Technology and Sustainability
- Fluid Mechanics

Brown University, Div. of Pre-College and Summer Undergraduate Programs, Providence, RI
 Online Course Instructor, 2016 - present

- Renewable Energy Engineering: Wind and Solar Power
- Women in Engineering program, co-teach with Professor Karen Haberstroh

Lecturer and Senior Research Engineer, 2001-2012

Instructor in following Laboratory sections:

- Fluid Mechanics
- Thermodynamics
- Heat and Mass Transfer
- Phase and Chemical Equilibrium
- Chemical and Biochemical Reactor Design
- Transport and Bio-transport Processes
- Engines and Turbines
- Water Supply & Wastewater Engineering
- Biomechanics
- Advanced Fluid Mechanics

Suffolk University, Physics Department, Boston, MA
 Senior visiting lecturer, 2008 – 2012

Blackboard courses:

- Fluid Mechanics
- Hydrology
- Introduction to Environmental Engineering
- Physical Sciences
- The Built World: How Humans Engineer Environments

Tallinn University of Technology, Department of Thermal Engineering, Tallinn, Estonia
Lecturer, 1995-1997

Blackboard courses:

- Chemical Process Dynamics and Control
- Heat and Mass Transfer

CONTRIBUTION TO TEACHING PROFESSION

Academic advising, Brown University, School of Engineering, Providence, RI

- Environmental Engineering Sc.B. and A.B. degree program concentration advisor
- Freshmen and sophomore undergraduate advisor
- Brown's Men's Crew academic advising, approximately 25 Brown athletes 2020 - present
- Student chapter advising, Brown University, School of Engineering, Providence, RI
 - Chemical engineering student chapter, AIChE
 - Environmental engineering student chapter, AAEES
- Chemical Engineering Sc.B. and A.B. degree program concentration advisor, 2019-2020