

MATTHEW NOAH PEARLSON

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EDUCATION

- Massachusetts Institute of Technology, M.S. Technology and Policy 06/2011
- Best Thesis Award nominee,
- University of Massachusetts-Amherst, B.S. Chemical Engineering 05/2007
- Magna Cum Laude, Minor in Chemistry, Honors Research Thesis, Dean's List

EMPLOYMENT

- Laboratory for Aviation and the Environment MIT – Research Engineer - Cambridge, MA 10/2012-Present
- Research focused on the technical and economic aspects of alternative transportation fuel production. The work quantifies life cycle greenhouse gas intensity, consumptive water intensity and production costs of various alternative and renewable fuels.
 - My work was the first to publish on the impact of product-slate choices for HEFA fuel production on the economic feasibility of renewable jet fuel from this pathway. This work has been used by the US EPA for their rulemaking on HEFA fuels under the Renewable Fuels Standard, and has provided significant guidance to other agencies such as FAA, DOD, and DOE about the economics of alternative fuels.
- US Department of Transportation Volpe Research Center – Cambridge, MA 10/2013-Present
- Supported the Freight/Fuels Transportation Optimization Tool (AFTOT) project by providing biofuels production and transportation expertise to a multi-disciplinary team of research optimization and geographic information system specialists at the Volpe Transportation Research Center.
 - Coded in python and used ArcGIS API (arcpy) to create a planning-level tool to optimize the transportation of alternative fuels across the United States and interfaced with external-facing stakeholders and partners, such as industrial biofuel producers, shippers, marketers, research collaborators, and consultants.
 - Identified a dozen optimal strategic scenarios from over 1000 technically possible alternative fuel production scenarios, and created simulation criteria for modeling the FAA's 2018 goal of producing one billion gallons of alternative fuel per year.
- Citizens Energy Corporation –Special Projects – Boston, MA 06/2012-9/2016
- Developed business plans and preformed due diligence on strategic investments and special projects relating to renewable energy, alternative fuels, and alternative transportation technologies.
 - Managed the development of 500 MW of late-stage wind generation projects in North America.
 - Designed and managed a \$30MM economic assistance program for low income families in Imperial Valley California.
- Made in the Commonwealth, LLC - Founder, Renewable Fuels Consultant – Boston, MA 04/2011-08/2013
- Developed a renewable jet fuel facility to serve Boston Logan Airport and meet the need for renewable fuels mandate in Massachusetts by working with strategic technology and business partners.
 - Finalist in student business plan competitions: MIT Clean Energy Prize \$200k (winner Transportation category) and BU \$50k (third place).
- Microsoft Corporation - Software Development Engineer in Test - Redmond, WA 06/2007-08/2009
- Developed automated software testing for the Device Stage user and application program interfaces.
 - Created automated software tests for energy saving features in the Windows 7.
 - Introduced automated failure analysis techniques to the device testing and Windows Portable Device teams.
- Infineum International Ltd. - Researcher, Crankcase Lubrication Technology – Linden, NJ 01/2005-05/2005
- ExxonMobil and Shell joint venture. Performed oil formulation, credential certification, and market analysis of lubricant technology for fuel efficiency improvements, emissions reductions, and drain interval extensions.
 - Analyzed and characterized phosphorus volatility mechanisms in experimental oil formulations using Selby-Phosphorus NOACK bench test and statistical methods.
 - Conducted comprehensive market study of hybrid and diesel passenger car trends and market impacts.

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RESEARCH EXPERIENCE

- Dept. of Aeronautics and Astronautics, Massachusetts Institute of Technology 08/2009-Present
- Nominated for Best Thesis Award
 - Developed a techno-economic and environmental framework for liquid biofuel production pathways.
- Huber Group - Dept. of Chemical Engineering, University of Massachusetts - Amherst 08/2006-05/2007
- Characterized the isoelectric point of metal oxide materials for the design of heterogeneous catalysts in aqueous-phase biofuel reaction pathways.
- Tester Group - Dept. of Chemical Engineering, Massachusetts Institute of Technology 06/2006-08/2006
- Synthesized N-1-(deoxy-fructos-1-yl)-glycine for identification in hydrothermal biofuel conversion.
 - Spectroscopic characterization of DFG using HPLC, NMR, UV-VIS, and mass-spec methods.
 - Investigated the stability of DFG in hydrothermal process conditions.
- NanoEngineering Group - Dept. of Mechanical Engineering, Massachusetts Institute of Tech. 06/2005-08/2005
- Characterized the electrical and thermal conductivities, and Seebeck coefficients for nano-composite thermoelectric.
- McFarland Group - Dept. of Chemical Engineering University of California Santa Barbara 06/2004-08/2004
- Fabricated and characterized a robust, and low cost photo-electrochemical catalyst for hydrogen gas production.
 - Awarded First Prize – AIChE national conference student poster competition

AWARDS, ACHIEVEMENTS, AND RECOGNITION

- RadTech - RadLauch 2018 | Alpha Class 05/2018
- \$25k Sandbox Innovation Fund Award 12/2016
- Green It Forward Award – presented for Citizens Energy’s Low Income Solar Home Program 05/2014
- Kairos 50 – Young Entrepreneur Award 02/2012
- Best Thesis Award Nominee – Massachusetts Institute of Technology 05/2011
- Finalist, Clean Technology Open Business Plan Competition 05/2011
- Finalist, MIT Clean Energy Prize \$200K Business Plan Competition 05/2011
- Finalist, Mass Challenge Business Plan Competition 05/2011
- Finisher, Boston Marathon 04/2011
- Finisher, Seattle Rock and Roll Marathon 06/2009
- 21st Century Leaders Award - University of Massachusetts - one of ten in 5,000 09/2007
- Class of 1941 Honors Humanitarian Award – Commonwealth College University of Massachusetts 05/2007
- Rhodes Scholar Nominee – University of Massachusetts 09/2006
- Barry M. Goldwater National Scholarship Nominee, University of Massachusetts 01/2005
- First Prize, AIChE National Conference Student Poster Competition 11/2004

OTHER ACTIVITIES

- Big Brother Volunteer, Jewish Big Brothers Big Sisters 07/2010-Present
- Founder, Theta Mu Chapter - Pi Kappa Phi Fraternity 12/2006

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PUBLICATIONS

Shi, R; Ukaew, S; Archer, D W; Lee, J; **Pearlson, M N**; Lewis, K C; Shonnard, D R; . Life Cycle Water Footprint Analysis for Rapeseed Derived Jet Fuel in North Dakota. *ACS Sustainable Chemistry & Engineering*. 5: 3845-3854. 2017

Ukaew, S; Shi, R; Lee, J H; Archer, D W; **Pearlson, M**; Lewis, K C; Bregni, L; Shonnard, D R; . Full Chain Life Cycle Assessment of Greenhouse Gases and Energy Demand for Canola-Derived Jet Fuel in North Dakota, United States. *ACS Sustainable Chemistry & Engineering*. 4: 2771-2779. 2016

Lewis, K C; Baker, G M; **Pearlson, M N**; Gillham, O; Smith, S; Costa, S; Herzig, P; Alternative Fuel Transportation Optimization Tool: Description, Methodology, and Demonstration Scenarios.. 2015

Blazy, D; **Pearlson, M N**; Miller, B; Bartlett, R E; . A Monte Carlo-based Methodology for Valuing Refineries Producing Aviation Biofuel. *Commercializing Biobased Products*. : 336-351. 2015

Staples, M D; Malina, R; Olcay, H; **Pearlson, M N**; Hileman, J I; Boies, A; Barrett, S RH; . Lifecycle greenhouse gas footprint and minimum selling price of renewable diesel and jet fuel from fermentation and advanced fermentation production technologies. *Energy & Environmental Science*. 7: 1545-1554. 2014

Seber, G; Malina, R; **Pearlson, M N**; Olcay, H; Hileman, J I; Barrett, S RH; . Environmental and economic assessment of producing hydroprocessed jet and diesel fuel from waste oils and tallow. *Biomass and Bioenergy*. 67: 108-118. 2014

Pearlson, M; Wollersheim, C; Hileman, J; . A techno-economic review of hydroprocessed renewable esters and fatty acids for jet fuel production. *Biofuels, Bioproducts and Biorefining*. 7: 89-96. 2013

Staples, M D; Olcay, H; Malina, R; Trivedi, P; **Pearlson, M N**; Strzepek, K; Paltsev, S V; Wollersheim, C; Barrett, S RH; . Water consumption footprint and land requirements of large-scale alternative diesel and jet fuel production. *Environmental Science & Technology*. 47: 12557-12565. 2013

Vasudevan, V; Stratton, R W; **Pearlson, M N**; Jersey, G R; Beyene, A G; Weissman, J C; Rubino, M; Hileman, J I; Environmental performance of algal biofuel technology options. *Environmental Science & Technology*. 46: 2451-2459. 2012

Barrett, S RH; Yim, S HL; Gilmore, C K; Murray, L T; Kuhn, S R; Tai, A PK; **Pearlson, M N**; et al, Public health, climate, and economic impacts of desulfurizing jet fuel. *Environmental Science & Technology*. 46: 4275-4282. 2012

Pearlson, M N; . A techno-economic and environmental assessment of hydroprocessed renewable distillate fuels. . MA thesis, Massachusetts Institute of Technology, 2011. Dissertations and Theses. 6 May 2011.

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PRESENTATIONS AND INVITED TALKS

The Foam Printing Project

- Society of Automotive Engineers World Congress – Detroit, MI 04/2018
- UV-EB | RadTech 2018 Conference 05/2018

The Economics of Alternative Jet Fuels

- Invited Talk, MIT Energy Club – Cambridge, MA 10/2015
- Invited Talk, MIT Energy Club – Cambridge, MA 11/2014
- Invited Talk, MIT Energy Club – Cambridge, MA 11/2013
- Society of Automotive Engineers Alternative Jet Fuels Conference - Brussels, Belgium 06/2013
- Invited talk, CONCAWE.EU Fuels Group -- Brussels, Belgium 06/2013
- Invited talk, Department of Energy ARPA-E – Washington, DC 06/2011

Economic and Environmental Analysis of Alternative Jet Fuel Production

- INFORMS Annual Conference - Austin, TX 06/2011

Design of heterogeneous catalysts for aqueous-phase reactions: the importance of the Isoelectric point

- New England Catalysis Society, Worcester Polytechnic Institute – Worcester, MA 11/2010

Synthesis and Characterization of N-1-deoxy-fructos-yl-glycine

- CONVERGE, Massachusetts Institute of Technology – Cambridge, MA 04/2007
- Summer Research Colloquium, Massachusetts Institute of Technology – Cambridge, MA 09/2006

Experimental Characterization of Silicon-Germanium Power Generating Materials

- CONVERGE, Massachusetts Institute of Technology – Cambridge, MA 08/2006
- Summer Research Colloquium, Massachusetts Institute of Technology – Cambridge, MA 10/2005

Synthesis and Characterization of Cu₂O/ZnO Heterojunctions for Photoelectrochemical Water Splitting

- American Institute of Chemical Engineers, Annual Conference - Austin, TX 08/2005
- Awarded First Prize 11/2004