

<b>EDUCATION</b>	<b>Massachusetts Institute of Technology</b> , Cambridge, MA <b>Ph.D.</b> , Mechanical Engineering: Renewable Water and Energy, 4.7/5.0, Minor: Entrepreneurship 9/2012 – 5/2015 <b>Cornell University</b> , College of Engineering, Ithaca, NY <b>M.Eng.</b> , Mechanical Engineering, 4.08 GPA, <b>Top of Class</b> 9/2010-12/2010 <b>B.S.</b> , Mechanical & Aerospace Engineering; Cumulative GPA: 3.70, Concentration GPA: 4.04 9/2006-5/2010
<b>RESEARCH</b>	<b>Research Highlights</b> <ul style="list-style-type: none"><li>• Authored 16 published or provisionally accepted/invited journal papers (average impact factor 8.04), 11 conference papers, and 16 patent applications. Helped secure \$527,500 in grant and prize money, and presented 30 times on science or technology, winning 9 presenter awards. Completed masters and PhD in a combined 3 years, the fastest in decades for MIT MechE, and also earned a national dissertation award in water science.</li><li>• Applies thermofluids and nanoengineering techniques to water treatment and the water-energy nexus, focusing on energy efficiency, surface phenomena, and developing world applications with the potential to save lives</li><li>• Assistant Professor at Purdue, Dept. of Mechanical Engineering, Birck Nanotechnology Center Starting 6/2018</li></ul>
<b>YALE RESEARCH</b>	<b>Nanomaterials for Water Treatment with Professors Elimelech and Kim (PostDoc)</b> 7/2017-present <ul style="list-style-type: none"><li>• Creating novel hierarchical ceramic membranes via nano 3D assembly for photocatalysis</li><li>• Collaborative work on photocatalysis techniques, nanofiltration membranes, membrane distillation</li></ul>
<b>MIT RESEARCH</b>	<b>Desalination Technologies with Professor Lienhard (PhD, PostDoc)</b> 9/2012-6/2017 <ul style="list-style-type: none"><li>• Invented most efficient desalination technology for 0.2-7% salinity via batch reverse osmosis: energy savings up to 64%, resulting in a journal paper, patents, and press releases. Commercializing with startup Sandymount</li><li>• Evaluated 6 leading desalination technologies driven by waste heat with exergy and 2<sup>nd</sup>-law efficiency analysis</li><li>• Authored review papers on potable water reuse and nanocomposite membranes for photocatalysis</li><li>• Harvard PostDoc part-time: Graphene Oxide characterization, wrote 7 grants with Prof. Vecitis 7/2016-5/2017</li></ul> <b>Membrane Distillation (MD) Desalination</b> <ul style="list-style-type: none"><li>• Authored 11 papers and 4 patents to understand and double the efficiency of MD, using numerical modeling and experiments: superhydrophobic condensing, effect of module inclination angle, multistage MD, MD module configuration efficiency, high salinity MD, low temperature thermal desalination, and conductive gap MD</li><li>• Authored 6 papers and 2 patents for conditions, methods, and thermochemical theory on MD membrane fouling: review of fouling, air layers for fouling prevention, operating conditions and filtration in MD, novel membranes</li><li>• Designed and constructed flexible and innovative MD apparatus with temperature, pressure, and velocity control</li><li>• Collaborated with 7 professors, 5 postdocs, and 12 graduate students across 4 departments</li></ul> <b>Heat Transfer for Combatting Hunger in the Developing World</b> 1/2013-present <ul style="list-style-type: none"><li>• Led design, optimization, construction, and implementation of phase-change thermal storage for food refrigeration for off-grid developing world applications. Cofounded startup, Coolify, to implement the technology.</li><li>• Optimization (Fluent modeling) and experiments for aquaculture oxygenation via solar thermal natural convection</li></ul>
<b>CORNELL &amp; RELATED RESEARCH</b>	<b>Variable Air Volume (VAV) Systems for Residential Buildings</b> 9/2013-present <ul style="list-style-type: none"><li>• Modelled VAV systems for residential buildings with eQUEST, consulted for VAV retrofit startup EcoVent</li></ul> <b>Scaled Modular Test Platform for Sustainable Building Systems (Cornell, Masters)</b> 11/2009-12/2010 <ul style="list-style-type: none"><li>• Led team of 7 graduate students in creation of a 1/10 size thermally-scaled building with energy control systems</li><li>• Simulated envelope and systems dynamic energy use and scaling factors via both equations and EnergyPlus</li></ul> <b>Undergraduate Research Experiences (Cornell, 3 research groups)</b> 2/2008-6/2009 <ul style="list-style-type: none"><li>• Researched on: Oxycombustion chemical simulation, Solar Thermal Temp. Maximization, Wetlands restoration</li></ul>
<b>TEACHING &amp; INSTRUCTION</b>	<b>Instruction in Research</b> 12/2012-present <ul style="list-style-type: none"><li>• Mentored 25 undergraduate students, earned <b>MIT institute premier mentorship award</b>.</li><li>• Helped students with desired skills, knowledge, career planning, courses, and recommendations</li><li>• Taught the UROP luncheons on <i>How to Mentor Undergrads</i> for graduate students and PostDocs 10/2015-present</li><li>• Contributed to MIT UROP (Undergraduate Research Opportunities Program), including lab tours, presenting to students on how to do research, and providing undergraduate research guidelines. 10/2014-present</li></ul> <b>Teaching Experience</b> <ul style="list-style-type: none"><li>• Taught for MITxplore, a free after-school math and problem-solving program for 4<sup>th</sup>-6<sup>th</sup> graders 3/2015-4/2017</li><li>• TA for Thermodynamics: taught weekly section, more students attended (35) than registered (30) Designed curriculum, review sessions; received highest rating among class's TA's (<b>4.63/5</b>) 8/2011-12/2011</li><li>• Grader for Dynamics, held regular office hours, planned and led review sessions 1/2008-5/2008</li><li>• Volunteer after-school Science Teacher at underprivileged Beverly J. Martin Elementary School 9/2007-12/2007</li><li>• Tutored freelance for math, physics, and engineering for grades 6 through graduate students 8/2003-present</li></ul>

**Teaching Certifications:** Engineering TA Development Program (Cornell), Kaufman Teaching Certificate (MIT)  
**Teaching Courses Taken:** The Art of Teaching (Cornell), Teaching College-Level Science and Engineering (MIT), Learner's Workshop (MIT), An Introduction to Evidenced-Based Undergraduate STEM Teaching (MOOC)  
**Successful Outcomes of Undergrad Researcher Mentees:** Graduate schools including MIT(3), Stanford(2), UMD; Companies including: RWL Water, SpaceX, Tesla, Stroud, Accenture, iDE, PA Consulting Group, & ExxonMobil.

**PATENTS** **Heat Transfer and Energy:** geothermal cooling, heat transfer surfaces, building heating and cooling, hybrid vehicles, wind turbines, and refrigeration  
**Desalination:** new configurations and efficiency of MD and RO, MD membranes; membrane fouling prevention

**INDUSTRY EXPERIENCE** **Cofounder and CTO, Coolify, Cambridge MA** 11/2012-2/2016  

- Cofounded startup, invented phase change thermal battery, raised funds, built and demonstrated prototype
- Implementing tech in India, for refrigerating food in areas with intermittent power
- Led team of 6 engineers in the design of the HVAC system, thermal storage, controls, and enclosure

**Consulting for Startups, Cambridge MA** 9/2012-8/2013  

- Thermofluids analysis, design, patenting, websites, fundraising, and/or cofounding for startups AquaOne Technologies, EcoVent, Curiosity, and EcoKitty

**Mechanical Engineer at Arup, Washington D.C.** 3/2011-6/2012  

- Designed solar thermal, PV, cogeneration, geothermal, chilled beam, building envelope, and other systems
- Consulted on net-zero Ecodistrict; the 22 building, 11 million square foot US Government sustainability showcase
- Designed HVAC systems, performed sustainability analysis for offices, art museums, university laboratories, hotels, performing arts centers, restaurants, spas, and embassies, including 6 LEED platinum projects

**Intern at Pareto Energy, Washington D.C.** 6/2007-8/2007  

- Start-up for micro-grids and energy, work included trigeneration and a \$100 million solar power station in Israel

**AWARDS** **Teaching/Mentoring Awards**  

- 2015 MIT Outstanding UROP Graduate Mentor (institute award, 1 given among 5,800 MIT graduate students)
- Hansen Masters of Engineering Fellowship (Cornell, teaching fellowship, \$5,000), 2010

**Academic Awards and Grants**  

- Universities Council on Water Resources Outstanding Dissertation Award in Science and Engineering (national)
- Ignition Grant, MIT&MICP Innovation Program (MMIP) Deshpande Center (\$100,000) (coauthor), 2015
- Innovation Grant, MIT&MICP Innovation Program (MMIP) Deshpande Center (\$300,000) (coauthor), 2015
- DOE SCGF Finalist, 2012 (National PhD Fellowship Competition)
- Outstanding Achievement Award (Cornell, for highest GPA among 85 graduating MechE masters students), 2010
- Bart Conta Prize in Energy and the Environment (Cornell, best research or design project), 2010

**Academic Presentation Awards**  

- 2016 IDW Best Oral Presentation Award (International Desalination Workshop, Abu Dhabi, UAE)
- 2015 IDA Best Poster Award (International Desalination Association, biennial premier conference in field)
- 2015 IDA Best Presenter Award (as 2<sup>nd</sup> author) (San Diego, CA)
- ACE15 Conference 1<sup>st</sup> (coauthor) and 2<sup>nd</sup> Best Poster Presentation (10,000 attendees, Anaheim, CA)
- 2015 MIT Water Night Best Poster Honorable Mention
- Sibley Graduate Research Conference People's Choice Award (Cornell), 2010

**Entrepreneurship Pitch Awards**  

- Harvard Innovation Lab 2015 Dean's Food System Challenge Co-Grand Prize Winner (\$27,500, 164 teams)
- Agricultural Innovation Grand Prize (\$100,000, national startup pitch competition), 2014 (Madison, WI)

**Engineering Competition Awards**  

- 1<sup>st</sup> Place Mechatronics Artificially Intelligent Battlebot Tournament (Cornell competition, ~150 students), 2009

**LEADERSHIP** **Conference Committee, MIT Low Carbon Desalination Workshop** 9/2016-12/2016  

- Codirected international conference and writing to develop a white paper on renewable desalination for COP22

**Director, MIT Water Night** 11/2015-3/2016  

- Directed, organized, and ran MIT's primary water research conference for Boston researchers & industry

**Engineering Team Leader, Solar House Team Project** 9/2007-10/2009  

- Coordinated 150-member team for the high-tech, sustainable, international "Solar Decathlon" competition.
- Designed and built innovative and efficient HVAC system with advanced control algorithms 8/2006-10/2009

**RELEVANT SKILLS**  

- Nanoengineering & machining: iCVD, SEM, XRD, EDS, UV-Vis, FTIR, Raman, ZP, AFM, lathe, mill, soldering, sheet metal, circuit work, piping
- Software- thermofluids, design, statistics, chemistry, programming: EES, MATLAB, FLUENT, Java, eQUEST, Trace 700, Solid Works, ANSYS, CAD, Revit, Adobe Illustrator, Excel modeling, Minitab, CHEMKIN, etc

**CERTIFICATES** • Secret Security Clearance (US State Department) • Six Sigma Black Belt Certification (statistical analysis)

## Peer Reviewed Journal Papers

### Published

- [1] **D. M. Warsinger**<sup>1</sup>, E. W. Tow<sup>1</sup>, K. Nayar, and J. H. Lienhard V, “Energy efficiency of batch and semi-batch (CCRO) reverse osmosis desalination,” *Water Research*, vol. 106, pp. 272-282, 2016.
- [2] J. Swaminathan, H. W. Chung, **D. M. Warsinger**, and J. H. Lienhard V, “Membrane distillation model based on heat exchanger theory and module comparison,” *Applied Energy*, vol. 184, pp. 491-505, 2016.
- [3] J. Swaminathan, H. W. Chung, **D. M. Warsinger**, and J. H. Lienhard V, “Simple method for balancing direct contact membrane distillation,” *Desalination*, vol. 383, pp. 53-59, 2016.
- [4] **D. M. Warsinger**, J. Swaminathan, L. Maswadeh, and J. H. Lienhard V, “Superhydrophobic condenser surfaces for air gap membrane distillation,” *Journal of Membrane Science*, vol. 492, pp. 578–587, 2015.
- [5] A. Servi, E. Guillen-Burrieza, **D. M. Warsinger**, W. Livernois, K. Notarangelo, J. Kharraz, J. H. Lienhard V, H. A. Arafat, K. K. Gleason, “The effects of iCVD film thickness and conformality on the permeability and wetting of MD membranes,” *Journal of Membrane Science*, vol. 523, pp. 470–479, 2016.
- [6] **D. M. Warsinger**, K. H. Mistry, K. G. Nayar, H. W. Chung, and J. H. Lienhard V, “Entropy generation of desalination powered by variable temperature waste heat,” *Entropy*, vol. 17, pp. 7530–7566, 2015.
- [7] H. W. Chung, J. Swaminathan, **D. M. Warsinger**, and J. H. Lienhard V, “Design study of multistage vacuum membrane distillation (MSVMD) system for high salinity application,” *Journal of Membrane Science*, vol. 497, pp. 128–141, 2016.
- [8] J. Swaminathan, H. W. Chung, **D. M. Warsinger**, F. Al-Marzooqi, H. Arafat, and J. H. Lienhard V, “Energy efficiency of permeate gap and novel conductive gap membrane distillation,” *Journal of Membrane Science*, vol. 502, pp. 171-178, 2016.
- [9] **D. M. Warsinger**, A. Servi, S. Van Belleghem, J. Gonzalez, J. Swaminathan, J. Kharraz, H. W. Chung, H. A. Arafat, K. K. Gleason, J. Lienhard V, “Combining air recharging and membrane superhydrophobicity for fouling prevention in membrane distillation,” *Journal of Membrane Science*, vol. 505, pp. 241-252, 2016.
- [10] **D. M. Warsinger**, J. Swaminathan, E. Guillen-Burrieza, H. A. Arafat, and J. H. Lienhard V, “Scaling and fouling in membrane distillation for desalination applications: A review,” *Desalination*, vol. 356, pp. 294–313, 2014. **(96 citations)**
- [11] **D. M. Warsinger**, J. Swaminathan, E. Tow, and J. H. Lienhard V, “Theoretical framework for predicting inorganic fouling in membrane distillation and experimental validation with calcium sulfate,” *Journal of Membrane Science*, vol. 528, pp. 381–390, 2017.
- [12] M. Rezaei, **D. M. Warsinger**, J. H. Lienhard V, W. M. Samhaber, Wetting prevention in membrane distillation through superhydrophobicity and recharging an air layer on the membrane surface,” *Journal of Membrane Science*, vol. 530, pp. 42–52, 2017.
- [13] **D. M. Warsinger**, A. Servi, G. B. Connors, M. O. Mavukkandy, H. A. Arafat, K. Gleason, and J. H. Lienhard, “Reversing membrane wetting in membrane distillation: comparing dryout to backwashing with pressurized air,” *Environmental Science: Water Research & Technology*, vol. 3, pp. 930–939, 2017.
- [14] Y. Roy, **D. M. Warsinger**, and J. H. Lienhard V, “Effect of temperature on ion transport in nanofiltration membranes: Diffusion, convection and electromigration,” *Desalination*, vol. 420, pp. 241 – 257, 2017.

### Reviews with Accepted Abstracts (Provisionally, pending revision)

- [15] S. Chakraborty, **D. M. Warsinger**, S. Hasan, S. Curcio, H. A. Arafat, John. H. Lienhard. V, and E. Drioli, “Polymeric nano composite membranes in photocatalysis - a comprehensive review,” *Energy and Environmental Science (abstract accepted)*, April 2016.
- [16] **D. M. Warsinger**, E. Tow, S. Loutatidou, H. A. Arafat, V. Tarabara, A. M. Mikelonis, A. Achilli, L. Karimi, M. Plumlee, S. Chakraborty, J. H. Lienhard V, and C. Bellona, “Review of polymeric membranes and processes for potable water reuse,” *Progress in Polymer Science (major revision)*, Jan 2017. **(Impact Factor 27.18)**

### Submitted

- [17] **D. M. Warsinger**, J. Swaminathan, L.L. Morales, and J. H. Lienhard V, “Visualization and Measurement of Filmwise and Dropwise Air Gap Membrane Distillation at Varied Module Inclination Angle and Gap Spacer Orientation,” Submitted to *Desalination*, April 2017.
- [18] **D. M. Warsinger**, “A convective sail can explain sauropod heat tolerance and long tails,” *Scientific Reports*, April 2017
- [19] J. Swaminathan, H. W. Chung, **D. M. Warsinger**, and J. H. Lienhard V, “Membrane distillation at high salinity: evaluating critical system size and optimal membrane thickness,” *Journal of Membrane Science*, July, 2017.

## Peer Reviewed Conference Papers

- [20] **D. M. Warsinger**, J. Swaminathan, and J. H. Lienhard V, “Ultrapermable membranes for batch desalination: maximum desalination energy efficiency, and system cost,” *IDA 2017 World Congress on Water Reuse and Desalination, São Paulo, Brazil, October 15-20, 2017*.
- [21] J. Swaminathan, E. W. Tow, **D. M. Warsinger**, and J. H. Lienhard V, “Effect of practical losses on optimal design of batch RO systems,” *IDA 2017 World Congress on Water Reuse and Desalination, São Paulo, Brazil, October 15-20, 2017*.
- [22] **D. M. Warsinger**, J. Swaminathan, L. L. Morales, and J. H. Lienhard V, “Visualization of droplet condensation in membrane distillation desalination with surface modification: hydrophilicity, hydrophobicity, and wicking spacers,” *4th International Workshop on Heat Transfer (IWHT), April 2-5, 2017, Las Vegas, Nevada, USA, 2017*.

- [23] **D. M. Warsinger**, A. Servi, G. Connors, J. Gonzalez, J. Swaminathan, H. W. Chung, H. A. Arafat, K. K. Gleason, J. H. Lienhard V, "Reversing wetting in membrane distillation: A comparison of pressurized air backwashing versus dryout," *Proceedings of the AMTA Membrane Technology Conference & Exposition (MTC16), February 1-5, 2016, San Antonio, Texas*, 2016.
- [24] K. A. Rambo, **D. M. Warsinger**, S. J. Shanbhogue, J. H. Lienhard V, A. F. Ghoniem, (October 2016). "Water-Energy Nexus in Saudi Arabia." In Energy Procedia. International Conference on Applied Energy. Beijing, China.
- [25] **D. M. Warsinger**, J. V. Gonzalez, S. M. Van Belleghem, A. Servi, J. Swaminathan, and J. H. Lienhard V, "The combined effect of air layers and membrane superhydrophobicity on biofouling in membrane distillation," in *Proceedings of The American Water Works Association Annual Conference and Exposition, Anaheim, California, USA*, 2015.
- [26] **D. M. Warsinger**, J. Swaminathan, , H. W. Chung, S. Jeong, and J. H. Lienhard V, "The effect of filtration and particulate fouling in membrane distillation," in *Proceedings of The International Desalination Association World Congress on Desalination and Water Reuse, San Diego, California, USA, Aug. 2015*.
- [27] K. G. Nayar, J. Swaminathan, **D. M. Warsinger**, J. Swaminathan, D. Panchanathan, , and J. H. Lienhard V, "Effect of scale formation on surface tension of seawater and membrane distillation," in *Proceedings of The International Desalination Association World Congress on Desalination and Water Reuse, San Diego, California, USA, Aug. 2015*.
- [28] J. Swaminathan, **D. M. Warsinger**, and J. H. Lienhard V, "Experimental investigation of high efficiency single-stage membrane distillation configurations," in *Proceedings of The International Desalination Association World Congress on Desalination and Water Reuse, San Diego, California, USA, Aug. 2015*.
- [29] K. G. Nayar, J. Swaminathan, **D. M. Warsinger**, and J. H. Lienhard V, "Performance Limits and Opportunities for low temperature thermal desalination," in *Proceedings of the 2015 Indian Water Week, New Delhi, India, Jan. 2015*.
- [30] **D. M. Warsinger**, J. Swaminathan, and J. H. Lienhard V, "Effect of module inclination angle on air gap membrane distillation," in *Proceedings of the 15th International Heat Transfer Conference, IHTC-15, Paper No. IHTC15-9351, Kyoto, Japan August 2014*.
- [31] J. Swaminathan, **D. M. Warsinger**, and J. H. Lienhard V, "Membrane distillation for high salinity feed desalination," in *Proceedings of the 11th IWA Leading Edge Conference on Water and Wastewater Technologies, May 2014*.

**Whitepapers/books** (\*This 125-page whitepaper created at an international workshop for COP22 will be expanded into a book)

- [32] \*J. H. Lienhard V, G. P. Thiel, **D. M. Warsinger**, and L. D. Banchik, *Low Carbon Desalination: Status and Research, Development, and Demonstration Needs*. Abdul Latif Jameel World Water and Food Security Lab, MIT, 2016.
- [33] L. Awerbuch, G. Canton, V. van der Mast, G. Carpenter, S. Delagah, S. Desai, M. Fabig, A. Felber, H. Fravel, Jr., V. Fthenakis, C. Gasson, P. G. S. W. Hasan, T. Hogan, S. Hong, I. S. Kim, B. Liberman, J. Lienhard, , N. Lior, , and P. MacLaggan, "Connecting people and ideas to water solutions," *International Desalination Association, American Water Summit, Miami Florida, December 6-7, 2017*.

**Patents**

*Granted*

- [34] **D. Warsinger (Martin)**, B. Tadayon, and S. Tadayon, "Wind turbine blade system with air passageway," *Full Patent (Granted), US8449255 B2*, March 2010.

*Pending Full Patent Applications*

- [35] **D. M. Warsinger**, E. W. Tow, and John H. Lienhard V. *US non-provisional application No. 15/296,668 October 2016*
- [36] **D. M. Warsinger**, E. W. Tow, and John H. Lienhard V. *International Patent Application No. PCT/US17/15009., January 2017*
- [37] **D. M. Warsinger**, E. W. Tow, R. McGovern, G. Thiel, and J. H. Lienhard V. *US non-provisional application No. 15350064 November 2016*
- [38] **D. M. Warsinger**, E. W. Tow, R. McGovern, G. Thiel, and J. H. Lienhard V. *International Patent Application No US17/18069, February 2017*
- [39] **D. M. Warsinger**, Swaminathan, A. Servi, Jaichander, and J. H. Lienhard V, "*US non-provisional application No. 15/157,663, May 2016*
- [40] J. Swaminathan, **D. M. Warsinger**, H. W. Chung, and J. H. Lienhard V, *US non-provisional application No 2016/0074812 A1, July 2016*,
- [41] J. Swaminathan, **D. M. Warsinger**, H. W. Chung, R. McGovern, and J. H. Lienhard V, *US non-provisional application NoNo.15/211,424 filed 15 July 2016*
- [42] J. Swaminathan, **D. M. Warsinger**, H. W. Chung, R. McGovern, and J. H. Lienhard V, *International Application No. PCT/US16/42571, filed 15 July 2016*
- [43] **D. M. Warsinger**, J. Swaminathan, and J. H. Lienhard V, *US non-provisional application No. 14/517,342, October 2014*.
- [44] **D. M. Warsinger**, J. Swaminathan, and J. H. Lienhard V, "*International Full Patent Application, PCT application No. PCT/US15/55960, October 2015*.
- [45] **D. Warsinger (Martin)**, B. Tadayon, and S. Tadayon, "Method and system for rotary coupling and planetary gear," *Full Patent Application, US20130267375 A1*, March 2010.
- [46] **D. M. Warsinger**, D. Patel, Y. Kelman, S. R. Lancaseter, J. Spada, and N. Johnson, "Method of and system for automatically adjusting airflow, app. no. 61902939," *Provisional Patent Application, US Application No. 61902939, November 2013*.

[47] **D. Warsinger (Martin)**, B. Tadayon, and S. Tadayon, "Heat exchange using underground water system," *Full Patent Application, US20120255706 A1*, March 2012.

#### *Provisional Patent Applications*

[48] J. Swaminathan, **D. M. Warsinger**, H. W. Chung, and J. H. Lienhard V, "Provisional Patent Application", September 2015.

[49] **D. Warsinger (Martin)**, "Hybrid vehicle optimization and control incorporating unconventional additional data," *Provisional Patent Application*, March 2012.

## **Presentations**

### *Conference Presentations (Excluding Conferences Internal to One University (10 Excluded))*

- [50] **Warsinger, D. M.**, Swaminathan, J., Vecitis, C., and Lienhard V, J. H. *IDA 2017 World Congress on Water Reuse and Desalination, São Paulo, Brazil, October 15-20, 2017*.
- [51] Swaminathan, J., Tow, E. W., **Warsinger, D. M.**, and Lienhard V, J. H. *IDA 2017 World Congress on Water Reuse and Desalination, São Paulo, Brazil, October 15-20, 2017*.
- [52] **D. M. Warsinger**, J. Swaminathan, L. L. Morales, and J. H. Lienhard V, "Improving the energy efficiency of membrane distillation desalination with jumping-droplet condensation," *Poster Presentation, Gordon Research Conference on Micro & Nanoscale Phase Change Heat Transfer, January 8-13, 2017, Galveston Texas, USA, 2016*.
- [53] **D. M. Warsinger**, Jaichander Swaminathan, and John H. Lienhard V. Visualization of droplet condensation in membrane distillation desalination with surface modification: hydrophilicity, hydrophobicity, and wicking spacers. *In Proceedings of The 4th International Workshop on Heat Transfer (IWHT), "Advances for Energy Conservation and Pollution Control," Las Vegas, Nevada, USA, April 2017*.
- [54] **D. M. Warsinger**, Emily W. Tow, Kishor Nayar, and John H. Lienhard V. *Enhancing energy efficiency of reverse osmosis with batch and semi-batch processes. In Proceedings of the IDA international Desalination Workshop (IDW2016), Abu Dhabi, UAE, November 2016. Session co-chair, Best Presenter Award*
- [55] **D. M. Warsinger**. Membrane technologies for potable water reuse. *In The Proceedings of Universities Council for Water Resources and National Institutes for Water Resources (UCOWR/NIWR) Conference, Oral Presentation, Pensacola Beach, Florida, USA, June 2016*.
- [56] **D. M. Warsinger**. The potential and need for desalination. *In The Proceedings of Universities Council for Water Resources and National Institutes for Water Resources (UCOWR/NIWR) Conference, Plenary Oral Presentation, Pensacola Beach, Florida, USA, June 2016. Plenary Presentation*,
- [57] **D. M. Warsinger**, Emily W. Tow, and John H. Lienhard V. *Inorganic fouling resistance of membrane distillation vs. reverse osmosis. In Proceedings of Singapore Water Week 2016 (SIWW), Singapore, July 2016*.
- [58] **D. M. Warsinger**, A. Servi, G. Connors, J. Gonzalez, J. Swaminathan, H. W. Chung, H. A. Arafat, K. K. Gleason, J. Lienhard V, "A novel air-cleaning method for membrane distillation," in *Oral Presentation, Proceedings of the AMTA Membrane Technology Conference & Exposition (MTC16), February 1-5, 2015, San Antonio, Texas, February 2016*.
- [59] **D. M. Warsinger**, K. G. Nayar, E. Tow, and J. H. Lienhard V, "Efficiency and fouling of closed circuit reverse osmosis and a novel variant: Pushing the limits on desalination efficiency," in *Oral Presentation, New England Graduate Student Water Symposium (NEGSWS), Amherst, MA, USA, 2015*.
- [60] **D. M. Warsinger**, J. Swaminathan, , H. W. Chung, S. Jeong, and J. H. Lienhard V, "The effect of filtration and particulate fouling in membrane distillation," in *Poster Presentation, Proceedings of The International Desalination Association World Congress on Desalination and Water Reuse, San Diego, California, USA, Aug. 2015. Best Poster Award*
- [61] J. Swaminathan, **D. M. Warsinger**, and J. H. Lienhard V, "Experimental investigation of high efficiency single-stage membrane distillation configurations," in *Oral Presentation, Proceedings of The International Desalination Association World Congress on Desalination and Water Reuse, San Diego, California, USA, Aug. 2015. Best Presenter Award*
- [62] **D. M. Warsinger**, J. V. Gonzalez, S. M. Van Belleghem, A. Servi, J. Swaminathan, and J. H. Lienhard V, "The effect of air layers and membrane superhydrophobicity on fouling in membrane distillation," in *Oral Presentation, Proceedings of The American Water Works Association Annual Conference and Exposition, Anaheim, California, USA, 2015*.
- [63] **D. M. Warsinger**, J. V. Gonzalez, S. M. Van Belleghem, A. Servi, J. Swaminathan, and J. H. Lienhard V, "The effect of air layers and membrane superhydrophobicity on fouling in membrane distillation," in *Poster Presentation, Proceedings of The American Water Works Association Annual Conference and Exposition, Anaheim, California, USA, 2015. 2<sup>nd</sup> Place, Best Poster Award*
- [64] J. Swaminathan, **D. M. Warsinger**, and J. H. Lienhard V, "Produced water treatment with multi-stage membrane distillation and humidification dehumidification systems," in *Proceedings of The American Water Works Association Annual Conference and Exposition, Anaheim, California, USA, Oral Presentation., 2015. 1<sup>st</sup> Place, Best Poster Award*
- [65] **D. M. Warsinger**, J. Swaminathan, and J. H. Lienhard V, "Effect of module inclination angle on air gap membrane distillation," in *15th International Heat Transfer Conference, IHTC-15, Kyoto, Japan August 11th, 2014*.

### Invited Talks

- [66] **D.M. Warsinger**, “Can we save lives with thermodynamics? Thermofluids and nanoengineering for the water-food-energy nexus,” Stanford University, *Paulo Alto, CA*, February 23, 2017. (Faculty interview, talk also given at 4 other institutes)
- [67] **D.M. Warsinger**, “Energy R&D needs for Electrical and Thermal Desalination,” In *Workshop: Challenges And Potential Opportunities Of Renewable Energy And Water Resources In Egypt*, Fayoum University, Egypt, Feb 1-6, 2017. **Plenary Presentation, Workshop Instructor**
- [68] **D. M. Warsinger**, “Batch reverse osmosis: the final frontier for efficiency,” *Tech Idol Session of the American Water Summit*, Miami, Florida, December 6, 2017, 2016. **National Competition**
- [69] **D. M. Warsinger**, “Combating growing water scarcity: the potential and need for desalination and water reuse,” in *Invited talk*, Rochester Institute of Technology, September 21, 2016.
- [57] **D. M. Warsinger**, “The global need for desalination,” 2016 UCOWR/NIWR Conference, Pensacola Beach, FL, June 22<sup>nd</sup>, 2016. **Plenary Presentation**,
- [70] **D. M. Warsinger**, Panelist, in *MIT Building Technology Startup Panel*, Cambridge Massachusetts, Aug. 2015.
- [71] **D. M. Warsinger**, Panelist, in *MIT Undergraduate Research Opportunities Program Freshman Pre-Orientation Program (UROP FPOP)*, Cambridge Massachusetts, Aug. 2015.
- [72] **D. M. Warsinger**, “Coolify, a decentralized micro cold storage solution,” *Social Innovator Spotlight*, Ag Innovation Showcase, St. Louis, MO, September 9th, 2014. **Plenary Presentation**
- [73] **D. M. Warsinger**, “Fouling and thermodynamic design of membrane distillation systems,” *MIT Water Club*, Cambridge MA, October 8th 2014.

### REFERENCES

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