

BIOGRAPHICAL SKETCH

Tzahi Y. Cath

Associate Professor, Civil and Environmental Engineering Department

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Professional Preparation

Tel Aviv University

Mechanical Engineering

B.Sc. 1992

University of Nevada, Reno

Civil Engineering

M.S. 2001

University of Nevada, Reno

Civil Engineering

Ph.D. 2003

Appointments

2012-present Associate Professor, Civil and Environmental Engineering, Colorado School of Mines

2010-present Director, Advanced Water Technology Center (AQWATEC), Colorado School of Mines

2006-2012 Assistant Professor, Environmental Science & Engineering, Colorado School of Mines

2004-2006 Research Assistant Professor, Civil and Environmental Engineering, UNR

2004 Post Doctoral Associate, Civil and Environmental Engineering, UNR

1992-1999 Engineer, GOI

Synergistic Activities

Thrust Leader, Efficient Engineered System, NSF Engineering Research Center for Reinventing America's Urban Water Infrastructure (ReNUWIit.org), Joint collaboration between Mines, Stanford University, University of California at Berkeley, New Mexico State University, current. National Science Foundation, CBET, Engineering Directorate, Proposal Review Panel, 2006, 2009, 2013

Serves as a member on journal editorial advisory board: *IDA Journal of Desalination and Water Reuse and Separation and Purification Technology*

Board member and Treasurer, WaterReuse Colorado, 2008-2012

Scientific Board member, Oasys Water (2009-present)

Recent or Current Grants and Awards as Principal Investigator (PI) or co-PI

NSF, Engineering Research Center (ERC) on Reinventing America's Urban Water Infrastructure via Stanford Univ., 5 yrs, \$6.0MM including state match (Thrust Leader).

US DOE/NREL, Low Enthalpy Geothermal Desalination, 11/2013-10/2014, \$250K (\$112K to CSM) (PI at CSM)

US DOE/ARPA-e, Power Generation from Waste Heat with Closed-Loop Membrane-Based System, 4/2013-1/2016, \$2.65MM (\$1.045MM to CSM) (PI at CSM)

US DOE/RPSEA, Advancing a Web-based Tool for Unconventional Natural Gas Development, 6/2013-5/2015, \$286K (Co-PI)

NSF, Sustainability Research Network, Routes to Sustainability for Natural Gas Development and Water and Air Resources in the Rocky Mountain Region, 10/2012-9/2017, \$12.0MM (\$1.4MM to CSM) (Co-PI at CSM).

NSF/CBET, Investigation of Mass and Heat Transport and Sustainability of the Novel Thermally Driven Membrane Distillation Crystallization Process, 9/2012-8/2014, \$223K (PI)

US DOE/RPSEA, Novel Engineered Osmosis Technology: A Comprehensive Approach to the Treatment and Reuse of Produced Water and Drilling Wastewater, 9/2011-8/2013, \$1.32MM (PI)

Select Publications (full publication list at <http://inside.mines.edu/~tcath/publications/index.html>)

- Hickenbottom, K.L., **Cath, T.Y.**, Sustainable operation of membrane distillation for enhancement of mineral recovery from hypersaline solutions, *Journal of Membrane Science*, 454 (2014) 426-435.
- Wijekoon, K.C., Hai, F.I., Kang, J., Price, W.E., **Cath, T.Y.**, Nghiem, L.D., Rejection and fate of trace organic compounds during membrane distillation, *Journal of Membrane Science* (2014) in press.
- Coday, B.D., Xu, P., Beaudry, E.G., Herron, J., Lampi, K., Hancock, N.T., **Cath, T.Y.**, The sweet spot of forward osmosis: treatment of produced water, drilling wastewater, and other complex and difficult liquid streams, *Desalination*, 333 (2014) 23-35.
- Coday, B.D., **Cath, T.Y.**, Forward osmosis: Novel desalination of produced water and fracturing flowback, *Journal AWWA*, 106 (2) (2014) DOI: <http://dx.doi.org/10.5942/jawwa.2014.106.0016>
- Plumlee, M.H., Debroux, J-F, Taffler, D., Mayer, X., Dahm, K.G., Hancock, N.T., Guerra K.L., Xu, P., Drewes, J.E., **Cath, T.Y.**, Coalbed methane produced water screening tool for treatment technology and beneficial use, *Journal of Unconventional Oil and Gas Resources* (2013) <http://dx.doi.org/10.1016/j.juogr.2013.12.002>.
- Vuono, D., Henkel, J., Benecke, J., **Cath, T.Y.**, Reid, T., Johnson, L., Drewes, J.E., Flexible hybrid membrane treatment systems for tailored nutrient management: A new paradigm in urban wastewater treatment, *Journal of Membrane Science*, 446 (2013) 34-41.
- Klaysom, C., **Cath, T.Y.**, Depuydt, T., Vankelecom, I.F.J., Forward and pressure retarded osmosis: Potential solutions for global challenges in energy and water supply, *Chemical Society Reviews*, 42 (2013) 6959-6989.
- Hancock, N.T., Xu, P., Roby, M.J., Gomez, J.D., and **Cath, T.Y.**, Towards direct potable reuse with forward osmosis: Technical assessment of long-term process performance at the pilot scale, *Journal of Membrane Science*, 445 (2013) 34-46.
- Xu, P., **Cath, T.Y.**, Robertson, A.P., Reinhard, M., Leckie, J.O., Drewes, J.E., Critical review of desalination concentrate management, treatment and beneficial use, *Environmental Engineering Science*, 30 (8) (2013) 502-514.
- Coday, B.D., Heil, D.M., Xu, P., **Cath, T.Y.**, The effects of transmembrane hydraulic pressure on performance of forward osmosis membranes, *Environmental Science and Technology*, 47 (5) (2013) 2386-2393.
- Siegrist, R.L., McCray, J.E., Lowe, K.S., **Cath, T.Y.**, Munakata-Marr, J, Onsite and decentralized Wastewater Systems: Advances from a decade of research and educational efforts, *WATER*, February 2013, 77-84.
- Cath, T.Y.**, Elimelech, M, McCutcheon, J.R., McGinnis, R.L., Achilli, A., Anastasio, D., Brady, A.R., Childress, A.E., Farr, I.V, Hancock, N.T., et al., Standard methodology for evaluating membrane performance in osmotically driven membrane processes, *Desalination* 312 (2013) 31-38.
- Hickenbottom, K.L., Hancock, N.T., Hutchings, N.R., Appleton, E.W., Beaudry, E.G., Xu, P., **Cath, T.Y.**, Forward osmosis treatment of drilling mud and fracturing wastewater from oil and gas operations, *Desalination*, 312 (2013) 60-66.

Select Intellectual Properties

- Cath, T.Y., Holloway, R.W., Herron, J.R., Lampi, K., Pravin, M.S., “Water reuse system and method” (UFO-MBR) Provisional application #61/751,195, filed on January 10, 2013.
- Pravin, M.S., Cath, T.Y., Holloway, R.W., Herron, J.R., Lampi, K., Schultz, W.L., “Water reuse system and method” (UFO-MBR nutrient recovery) Provisional application #61/876,108, filed on September 10, 2013.
- Hickenbottom, K.L., Cath, T.Y., Pannell, D.K., Poe, J., “Methods for sustainable membrane distillation concentration of hyper saline streams”, US 20130327711 A1, Filing date: June 11, 2013.
- Cath, T.Y., Milne, C., Pannell, D.K., Poe, J., Reynolds, M., “Methods for osmotic concentration of hyper saline streams” WO 2013134710 A1 (also US 20130233797 A1), Filing date: Mar 8, 2013.