Kjersti Wergeland KRAKHELLA

CONTACT INFORMATION

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Profile



I am a researcher with key qualifications in simulations and fuel cells. I have work experience within fuel cell systems for maritime use and space, a PhD in energy storage by salt gradient batteries and a master's degree in Physics and mathematics from NTNU, with a master's thesis in coating for bipolar plates in PEM water electrolysers.

EDUCATION

aug 2015-aug 2019	PHD IN MATERIAL SCIENCE, NTNU , Trondheim Title: <i>Energy Storage by Salinity Gradients</i> , Defense: Nov. 2019 I have conducted research in energy storage using salt gradients as large-scale storage of renewable energy; mainly through (reverse) electrodialysis. The research contained both experimental work and simulations in MATLAB. I have built up two laboratories and developed measurement techniques for the electrochemical testing of membranes. PhD supervisors: Kristian Etienne Einarsrud (IMA,NTNU), Odne Stokke Burheim (FPRT NTTNU), and Frada Salavd (IMA,NTNU).
aug 2010 - jun 2015	MASTER'S DEGREE IN PHYSICS AND MATHEMATICS, NTNU , Trondheim Master's thesis title: <i>Coating for bipolar plates for PEM water electrolysers</i> , I gained extensive knowledge in physics and mathematics, and in courses such as Tech- nology and management, Programming (C++, MATLAB, Python and LabVIEW) and Chemistry. During the master's thesis, I made protective coating for bipolar plates in PEM electrolysers. Supervisors: Anders Ødegård (SINTEF), Peter Berg (IFY,NTNU).

WORK EXPERIENCE

FEB 2020-NOV 2024	RESEARCHER, CLARA VENTURE LABS, Bergen Permanent position
	I run experiments on fuel cells and electrolysers, and simulates these systems in MAT-LAB/SIMULINK. In three different maritime projects, I am responsible for a digital twin for the fuel cell systems in production. I also have operated a 200 kW PEM fuel cell at a larger test facility. Within space, I am the project leader in one project, and involved in designing and testing a PEM fuel cell and a PEM electrolyser in other projects.
JUN 2014-JUL 2014	Research assistant at SINTEF INDUSTRY, Trondheim $Summer\ job$
	As a kick-off for my master's thesis, I researched corrosion-protective coating for bipolar plates for PEM. I made the coating, tested the coated bipolar plate in the PEM stack environment and measured the impact the tests had on the resistance in the plate.
JUN 2013 - AUG 2013	Assistant, NATIONAL OILWELL VARCO, Trondheim
	Summer job
	I verified a SIMULINK-model which simulated forces on string and drill bits during drilling. The verification was based on comparing simulation with large quantities of data, and running a hypothesis test on the model.

JUN 2005 - JUNE 2014 Various jobs Personal mentor at Student Services (NTNU), customer service Nor-Fishing in Trondheim, helper on farm trough YSS Landbruksteneste and assistant at a nursing home.

PUBLICATIONS

Bokach, D; Hansen, SS; Heimstad, F; Pettersen, JE; Ahmed, JS; Skaar, KT; Farnes, JB; Solheim, BGB; Krakhella, KW; Svendby, J, "Regenerative Fuel Cell System Breadboard for Lunar Night Survival at TRL 4+." 2023 13th European Space Power Conference (ESPC), IEEE 2023.

Solheim, BGB; Farnes, JB; Bokach, D; Pettersen, JE; Ahmed, JS; Heimstad, F; **Krakhella, KW**; Skjelanger, K; Ølnes, JS; Geneste, X, "Simplifications in Regenerative Fuel Cell Systems Enabled by Inclusion of a Static Water Vapour Feed High Pressure PEM Electrolyser Subsystem." 2023 13th European Space Power Conference (ESPC), IEEE **2023**.

Krakhella, K.W.; Morales, M.; Seland, F.; Bock, R.; Burheim, O.S.; Einarsrud, K.E. "Electrodialytic energy storage system: Permselectivity, stack measurements and life-cycle analysis". *Energies* **2020**, 13, 5, 1247.

Krakhella, K. W., "Energy Storage by Salinity Gradients." Thesis for the Degree of Philosophiae Doctor, NTNU 2019. Date of defence: 26th of November.

Krakhella, K.W.; Bock, R.; Burheim, O.S.; Seland, F.; Einarsrud, K.E. "Heat to H_2 : Using Waste Heat for Hydrogen Production through Reverse Electrodialysis". *Energies* **2019**, 12, 3428. (Front Cover).

Jalili, Z., **Krakhella, K.W.**, Einarsrud, K.E., Burheim, O.S. "Energy generation and storage by salinity gradient power: A model-based assessment". *Journal of Energy Storage* **2019**, 24, 100755.

Skilbred, E.S., **Krakhella, K.W.**, Haga, I.J.M., Pharoah, J.G., Hillestad, M., del Alamo Serrano, G., Burheim, O.S. "Heat to H₂: Using Waste Heat to Set Up Concentration Differences for Reverse Electrodialysis Hydrogen Production". *ECS Transactions* **2018**, 85(13), 147-161.



Krakhella, K. S., "Coatings for Metal Bipolar Plates in PEM Water Electrolysers0". Master's thesis at NTNU, in cooreration with SINTEF, TFY4900 - Physics master's thesis 2015.

IT-ABILITIES

Basic knowledge: C++, HTML, HYSYS, LABVIEW. Advanced knowledge: MATLAB, SIMULINK, PYTHON, LATEX.